WG+E

WESTFIELD GAS + ELECTRIC

# INFORMATION AND REQUIREMENTS FOR ELECTRICAL SUPPLY BELOW 600 VOLTS

WESTFIELD GAS + ELECTRIC LIGHT DEPARTMENT

# WESTFIELD GAS + ELECTRIC LIGHT DEPARTMENT

## BUSINESS OFFICE | CUSTOMER SERVICE

100  Elm Street
P.O. Box 990
Westfield, MA 01086-0990

## OPERATIONS CENTER

40 Turnpike Industrial Road
P.O. Box 990
Westfield, MA 01086-0990

**Customer Service | Billing & Credit  | Engineering**

(413) 572-0100

**General Repair | Street Light Repair | Tree Trimming**

(413) 572-0000

## EMERGENCY SERVICE - 24 HOURS

## (413) 572-0000

www.wgeld.org

Revised August 2025

# INTRODUCTION

## General Information

This handbook is provided as a reference for **architects, engineers, contractors**, and **WG+E customers** to assist with planning and understanding electric service requirements.

> **Important:** Design or construction work **must not** begin until WG+E's Electric Engineering Department has **received and reviewed complete details** of the proposed project.
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> For questions or assistance, please contact our Electric Engineering Department directly.

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## Electric Service Regulations

Electric service is provided by WG+E in accordance with the following:

- **Massachusetts Department of Public Utilities (DPU) Rules and Regulations**
- **WG+E Terms and Conditions for Electric Distribution Service**
- **National Electrical Code (NEC)**
- **WG+E Policies, Procedures, and Rate Schedules**
- **Applicable Industry Standards**

Please note: These requirements may change over time. Updated information is **not** included in this document but can be obtained from WG+E upon request.

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## Service Continuity and Liability

WG+E makes every reasonable effort to maintain a **regular and uninterrupted electric supply**. However, service may be **interrupted, curtailed, or discontinued** as outlined in WG+E's Terms and Conditions. WG+E is **not liable** for any **loss or damage** – direct or consequential – that may result from such interruptions or discontinuations of service.

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## Compliance Requirements

Failure to meet the requirements outlined in this handbook – or to comply with applicable codes and regulations – may result in:

- WG+E **refusing to energize** a new service, or
- WG+E **disconnecting** an existing service.

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## Revisions and Updates

WG+E reserves the right to update or revise this handbook at any time due to:

- Changes in **laws or safety regulations**
- **Diagram or specification** updates
- Internal **policy revisions**

We recommend verifying with WG+E that you have the most current version of this document before proceeding with any work.

# Table of Contents

# DEFINITIONS

- **Westfield Gas and Electric Light Department**: Herein known as “WG+E” or “the Department”.
- **Customer**: The person or entity responsible for paying our bill or their agents who are responsible for work being done, herein known as “the Customer”
- **Code(s):** The latest revision of The National Electrical Code and/or applicable state or local codes and ordinances.
- **Service:** The conductors and equipment for delivery of electric energy from the WG+E distribution system (supply system) to the wiring system of the premises served.
- **Secondary Service:** 600 volts or less.
- **Primary Service:** Above 600 volts.
- **Service Drop:** The overhead service conductors between WG+E facilities and customer structure.
- **Service Equipment:** The main control and protection equipment, i.e., main switch or circuit breaker.
- **Service Lateral:** The underground service conductors and conduit starting:
    1. at the street main, or
    2. at the top of a riser on a pole or other structure, or
    3. from a transformer; and/or splicing (Pulling) Box to the first connection of the service in a terminal box, meter box or other enclosure.
- **Service Location:** The approved point of attachment of WG+E-owned electric service drop; or the approved point of entry of WG+E-owned electric service lateral to building.
- **Terms and Conditions for Electric Distribution Service:** Terms and Conditions for receiving electric service from the Department are available at www.wgeld.org.
- **Underground System:** WG+E-owned electrical distribution facilities installed in the ground in conduit, duct banks, manholes, hand-holes, vaults, pads, etc. (direct burial excluded).

# Section 1 - General

## A. Request for Electric Service

1. WG+E's 'Request for Electric Service' procedure will:
    a. Provide a uniform method for responding to and processing a customer's request for electric service.
    b. Encourage the customer or contractor to contact the Department well in advance to allow for proper planning and ordering of materials.
    c. Provide written confirmation which will:
        1. Designate the service location.
        2. Specify the type and character of supply to be furnished.
        3. Specify location and requirements for our metering equipment.
        4. Identify advance charges, if any.
        5. Identify special requirements, if any, and
        6. Provide an estimated completion date.
2. Electric Service Applications must be used to apply for any service (new, changed, removed or temporary). Apply at WG+E's office at 100 Elm Street or online. The Request should be submitted at the earliest possible date and filled out as completely as possible.

    https://www.wgeld.org/

3. All service proposals must be confirmed in writing. The Department will not be responsible for mistakes or misunderstandings resulting from information communicated otherwise.

## B. Wiring Requirements

All services must be approved by WG+E and the local inspecting authority prior to energizing any service.

## C. Temporary Service

1. WG+E will supply 200 amp 120/240 volt temporary services when it can be served from existing WG+E-owned lines or facilities. The Customer must:
    a. Supply and maintain suitable service entrance equipment (weatherproofed, if required); and
    b. Pay, in advance, the cost of connecting and disconnecting this service. This excludes the cost of installation and removal of any

poles, wires, transformers, meter equipment or other facilities. These charges are in addition to the regular rate applicable to the use of energy.

2. Requirements for temporary service are shown in Section 9 (Figures 2 and 3).
3. Temporary services are generally disconnected when the permanent service is installed, unless otherwise instructed. Temp services shall not remain in place for longer than 12 months unless agreed upon by WG+E.

## D. Residential Cut and Reconnect Policy:

WG+E will authorize electrical contractors to cut and reconnect services or pull and reset meters (residential only) in order to expedite work requested by a customer when the following criteria are met. The contractor must:

a. have a proper electrical license.
b. complete an electric service application before work starts.
c. obtain a wiring permit.
d. notify WG+E Dispatch just prior to work commencing.
e. Failure to comply with this section may result in a Cut Meter Seal fee.

## E. Our Equipment on Private Property

All WG+E equipment located on Customer premises, such as poles, conductors, meters, current transformers, auxiliary metering equipment, transformers, ducts, etc., shall remain WG+E property and may be removed by WG+E in the event such equipment is no longer needed.

## F. Access to Installation

WG+E maintains the right to enter the Customer's premises at reasonable times to erect, remove, operate, or maintain WG+E facilities and to read and test Department-owned meters. The access area must be capable of carrying heavy vehicles and equipment, if they are required. WG+E is not responsible for restoring trees, shrubs, grass, if damage is caused because of inadequate access.

## G. Safety Requirements

1. The covering which may be observed on wires must not be regarded as insulation. **Contact with wires may cause serious injury.**
2. Antennas, banners, lighting, signs, customer equipment, etc., shall not be attached to our poles. Such equipment, when installed nearby, shall be far

enough away so as to not come in contact with WG+E facilities during installation or removal, per applicable regulations.

3. Swimming pools or structures must not be installed beneath or above WG+E facilities.
4. CALL BEFORE YOU DIG - 811 is the national call-before-you-dig clearing house. Anyone planning to dig **must call 811** or visit DigSafe.com **at least three business days** (72 business hours) before digging to request that the approximate location of buried utilities be marked with paint or flags.

   Hitting a buried line while digging can disrupt utility services, cost money to repair, involve a significant state-issued fine, or cause serious injury or death. Always contact 811, wait the required time for utility companies to respond to your request, and ensure that all utilities have responded to your request before putting a shovel in the ground. 811 protects you and your community!

   As you dig, respect the utility marks (paint or flags). The marks provided by utility operators are your guide for the duration of your project. If you are unable to maintain the marks during your project, or the project will continue past your request's expiration date, please contact your 811 center to ask for a re-mark.

   Always dig carefully. Massachusetts state law prohibits the use of mechanized equipment within 18 inches on all sides of a marked utility, which is called the "tolerance zone." If you must dig near the marks, hand dig or use vacuum excavation to expose the facility. After exposing the facility, avoid using mechanized equipment within the same tolerance zone.

## H. Service Changes

When changes or alterations are made to your service equipment, the service entrance and meter installations must conform to both WG+E requirements and all applicable Codes.

## I. Inspections

WG+E's inspection of the customer's service facilities or wiring is not an approval of conformance to applicable codes. The purpose of our inspection is to ensure that WG+E requirements are met with respect to line, load, ground connections, the meter installation, and that the installation is in conformance with this document.

## J. Employees' Identification

All WG+E employees carry photo identification, which they will present on request.

[ END OF SECTION 1 ]

# Section 2 - Types of Electric Service

## A. Request for Electric Service

Upon receipt of an Electric Service Application, WG+E will determine the type of service based on your location, and the size and character of the proposed load.

## B. Primary Service

Requirements for primary service (over 600 volts) are not included in this document. In order to provide such service, a detailed consultation is required with our Engineering Department personnel.

## C. Types of Secondary Service

1. Residential Overhead (400 amp maximum): The Department will furnish, install and maintain all poles, conductors, transformers and associated equipment required for overhead service. If the service lateral exceeds 300 feet in length, the Customer shall pay the Department the actual cost of that part of the lateral excess of 300 feet. Any service requiring over 400 amps total connected load must be installed in accordance with Commercial Underground requirements. This includes multi-unit dwellings with over (4) 100 amp services or over (2) 200 amp Services.
2. Residential Underground from Overhead Distribution: The Customer will furnish and install all required conduits and conductors required for the underground service. This shall be installed in accordance with the local electrical codes. The Department will make all permanent connections at the pole.
3. Residential Underground from Underground Distribution: The Customer shall furnish, install and maintain the underground conduits from the house to the street location to be determined by the Department. The Department will furnish, install and maintain all underground conductors. The Department will make permanent connections at the street as well as at the customer-provided meter socket.
4. Commercial Underground: The Department will furnish, install and maintain all underground primary conductors, transformers and associated equipment required for underground service at the Customer's expense. The Customer shall furnish, install and maintain, in accordance with the Department's requirements, the underground conduit system, hand holes and transformer foundation as required. The Customer will also furnish,

install and maintain the required secondary conductors required for the service.

5. Commercial Overhead: Commercial services, new or upgraded, are to be placed underground.
6. Temporary Service: Refer to Section 1-C.

[ END OF SECTION 2 ]

# Section 3 - Character of Supply (480 Volts and Below)

## A. Supply Characteristics

1. The Department will supply alternating current with a nominal frequency of 60 Hertz (cycles per second) and a nominal voltage as described in paragraph 3.
2. Customers seeking a new service or an increase in capacity should contact the Department before purchasing any equipment or beginning any electric construction. WG+E will designate the voltage and phase characteristics which will be available.
3. Normally, one of the following will be supplied:

| Normal Voltage | Phase | Wires |
|---|---|---|
| 120/240 | 1* | 3 |
| 120/208 | 1* | 3 |
| 208Y/120 | 3 | 4 |
| 480Y/277 | 3** | 4 |

* In general, only single-phase with a 400 amp maximum service will be supplied to residential loads.

** Normally only available for ground level "pad mounted transformers" to supply combined or isolated loads of 75 KVA or larger.

WG+E cannot, and will not, guarantee to maintain the voltage level of these nominal values under all conditions; however, voltage will normally be maintained within reasonable limits and as specified by the regulatory authority.

## B. Unusual Conditions

The Department may refuse to supply electric service to loads which have characteristics which might adversely affect the supply to other customers.

## C. Three Phase Three Wire Supply

If the Customer’s supply is a Delta Secondary, consult the Department before planning any changes or additions.

[ END OF SECTION 3 ]

# Section 4 - Our Service Facilities

## A. General

1. WG+E or its agents shall install all facilities which the Department will own, operate, and maintain and shall perform all work on Department-owned poles and equipment.
2. The Customer will be responsible for the cost of installing service facilities. Where the Department assumes responsibility for future operation and maintenance, WG+E shall hold the title of ownership to such facilities.
3. Service installations involving special conditions due to size of load, physical limitations, rate application or other special requirements of the Customer will be subject to joint study and agreement between WG+E and the Customer.
4. All connections or disconnections between WG+E facilities and Customer facilities will, in general, be made by the Department or our agents.
    i. However, in the case of single-phase residential services, qualified electricians who have met the Departments requirements will be permitted to cut and reconnect such services in compliance with existing Department policy (Refer to Section 1-D for details).

## B. Service Location

WG+E will designate the location for a new service or change of service. It is the Customer's responsibility to request this information.

## C. Number of Services

1. Normally, only one service will be installed to a single building or structure.
2. If more than one service is installed to a building or structure with the approval of the local authority, such services shall not be interconnected.
3. Each service will be separately metered and will be billed as serving a separate customer under the appropriate rate.

## D. Disconnecting or Relocating Service at Customer's Request

WG+E will temporarily disconnect or relocate the Customer's service during normal business hours to allow you to perform maintenance or construction. WG+E may require up to 10 days' notice to schedule the work. Consult with the Department for details. Approved inspection by the city inspector may be required.

## E. Removal of Service at Customer's Request

1. Building Demolition - After receipt of Customer's written request through the building department, all WG+E services will be removed. After such removal, WG+E shall promptly confirm in writing to the Building Department that services have been removed.
2. Other Than Demolition - If the service must be removed from a building or structure where no demolition is to take place, a written request to the Department is required. Written confirmation will not be furnished unless requested.

[ END OF SECTION 4 ]

# Section 5 - Customer's Service Facilities

## A. Service Location

Refer to Section 4-B.

## B. Service Equipment

1. For safety considerations, refer to Section 1- G.
2. The service equipment must be properly rated for voltage, current, interrupting, duty, and ground fault. Upon request, the Department will furnish the information necessary to select proper equipment. Higher than usual interrupting duty is required for main and branch circuit protection devices, when supplied from a network system or transformation in excess of 150 KVA capacity.

## C. Service Entrance Conductors

1. Where a main switch or circuit breaker constitutes the service equipment for a residential single-phase installation, the minimum ampacity of the service entrance conductors and socket meter trough shall be at least equal to the rating of the main circuit breaker or the largest main fuse which can be installed in the service equipment.
2. For a single-phase installation to an individual customer where more than one switch or circuit breaker is permitted as the service equipment, the ampacity of the service entrance conductors and socket-meter trough shall be a minimum of 100 amperes and not less than:
    a. 100% of the total rating of the two largest protective devices;
    b. Plus 75% of the total rating of the next two larger protective devices;
    c. Plus 50% of the rating of each additional protective device;
    d. In no case shall the ampacity of the service entrance conductors be less than that required by the Code.
3. For multiple-occupancy buildings, where up to six individual switches or circuit breakers function as the disconnecting means, the service entrance conductors must have adequate ampacity for the load as determined by applying the methods and rules set forth in the Code.
4. Metered and unmetered conductors shall not be contained in one raceway or conduit unless specific exception is approved by the Department.

5. Metered conductors from more than one meter shall not be contained in one raceway or conduit unless specific exception is approved by the Department.
6. ***SERVICE CONDUCTORS TO WG+E EQUIPMENT, SINGLE OR MULTIPLE PHASE MUST BE NO LARGER THAN 500 MCM***.
7. For multiple occupancy buildings where multiple entrance cables are used, provisions must be made to provide the Department with one (1) set of conductors for permanent attachment. If the total connected load of the multiple entrance cables exceeds 400 amps, the service must be placed underground and installed in accordance with Commercial Underground service requirements. All connections on entrance cables shall be made in a permanent fashion (i.e. sleeved connectors). Refer to Figure 4 in Section 9 for additional requirements.
8. All sleeves or connectors needed to make connections to WG+E equipment will be provided by the Customer.
9. All equipment needed for final connection ***must*** be approved by the Department.

[ END OF SECTION 5 ]

# Section 6 - Meter Installation

## A. General

1. ***UNDER NO CIRCUMSTANCES WILL ELECTRICITY BE SUPPLIED WITHOUT BEING METERED OR OTHERWISE ACCOUNTED FOR UNDER SPECIAL ARRANGEMENTS MADE WITH THE DEPARTMENT.***
2. The Customer shall furnish, install, own, and maintain the necessary, approved meter socket or enclosure with the exception of instrument transformer sockets (CT's)
3. The Department will furnish, own, and maintain all metering equipment.
4. **In multiple meter installations**, each meter, and the corresponding switch position, shall be marked by the Customer to permanently identify the apartment, store, office, or portion of the building that it serves.
5. The marking of such multi-meter installations shall be in accordance with Figure 14 in Section 9. If another configuration is planned, notify the Engineering Department for marking requirements.

## B. Standard Meter Installations

1. The two types of standard metering installations are:
    a. Self-contained
    b. Instrument transformer
2. The type of meter installation is determined by the voltage, phase, and size of the service disconnecting means. Any service 320 AMP and less requires a self-contained meter. Any service 400 AMP and larger require current transformers.

    Note: Based on load projections and at the sole discretion of the Department a self-contained 320AMP meter may be installed on 400AMP services.

    Further information on each type of metering installation is given in the following paragraphs:

## C. Meter Locations

1. We will designate the meter locations for new or changed/upgraded installations.
    a. All residential meters shall be located outdoors.
    b. Commercial meters shall be located outdoors.
    c. Meters shall be grouped so as to keep the number of metering points at a minimum,
    d. Other specific exceptions may be approved.
2. The Customer shall maintain a clear workspace directly in front of each meter location, as well as a suitable approach to meter location(s). Such workspace shall be at least 4 feet wide, shall extend out from the meter at least 3 feet and up to a height of at least 6 feet.

## D. Metering Equipment Mounting and Supports

1. Meter sockets shall be mounted plumb and securely fastened to a permanent rigid wall. (Refer to Figure 6 in Section 9.) Rust-resistant wood screws of sufficient size shall be used to hold the socket securely. Standard expansion bolts or anchors shall be used on masonry.
2. An individual meter, or meters mounted adjacent to each other horizontally, shall be installed so that the center is approximately 5 feet from the floor or final grade. (Refer to Figure 14 in Section 9.) Not more than three meters may be positioned vertically for outdoor installations. (Refer to Figure 13 in Section 9.) Consult with the Department for acceptable spacing.

## E. Grounding

1. The requirements of the Code shall be followed relative to grounding requirements set by the City Electrical Inspector.
2. The Customer's service entrance installation shall have a neutral or identified phase conductor which is grounded as required by the Code.
3. Careful attention should be given to the Code requirements for the choice of a system grounding conductor. To avoid corrosion problems, the Department strongly recommend the use of copper in all cases. Copper should not be connected to aluminum without the use of a proper connector.
4. The system grounding conductor shall not be connected to any part of a gas or fuel oil system.

## F. Cover Plates

After the meter socket has been installed, it is the Customer's responsibility to protect the interior of the socket by the installation of a temporary cover until the meter is set. Installing jumpers is not allowed unless permission is given by the Department.

## G. Meter Equipment and Seals

1. **All meters and all points** of access to unmetered wiring on Customer premises shall have sealing provisions.
2. The breaking of the Department seals, or connecting, disconnecting, or tampering with WG+E-owned metering equipment by unauthorized persons is **strictly prohibited**. The law provides for monetary penalties for theft of electricity.
3. If it becomes necessary to gain access to any of this sealed equipment, the Customer **shall contact the Department** and receive permission to do so. At that time, WG+E will make arrangements to reseal the installation. Failure to notify may result in a Cut Seal fee.

## H. Self-Contained Single-Phase Meter Installations (Also see Section 6-B.2)

1. Metering Equipment
    a. Approved sockets are required for all 120/240-volt single phase and 208Y/120-volt three wire network installations of not over 320 ampere capacity. (See Figure 7 in Section 9.)
    b. The Customer shall furnish, install, own, and maintain approved meter sockets. For the latest list of approved sockets refer to the Engineering Department.
    c. Where damage occurs or is anticipated, outdoor socket meters shall be protected by a suitable box with hasp and staple for installation of a lock. The Department will determine if a protective box is required. This box shall be furnished, installed, owned, and maintained by the Customer, the lock will be provided by the Department.
2. Meter Socket Connections
   Line-side conductors are always connected to the top terminals of meter sockets and the load side conductors to the bottom terminals. Standard connections for socket meter installations are shown on Figure 6 in Section 9. When installing a solar array system, see Figure 1 in Section 9 for meter socket details.

3. Multi Dwelling Unit Metering
   Custom-made installations and modular panels may be used for groups of meters, such as apartment houses. Prints of these arrangements must be submitted to and approved by the Department prior to installation.
   a. All meter sockets on troughs must be identified by apartment, room, or condo number according to Department specifications before meter installation order will be released.
   **b. THE DEPARTMENT DOES NOT AUTHORIZE THE JUMPERING OF METER SOCKETS. PENALTIES ASSOCIATED WITH THE THEFT OF ELECTRICITY WILL BE ENFORCED.**
4. Metering for Mobile Homes, Campgrounds, and Marinas
   a. Mobile home metering facilities shall be provided by the owner on permanent supports not physically attached to the home. The supports shall be adequate for one or more-meter installations and shall be set at a 3-foot minimum depth. They shall be galvanized steel in concrete or treated posts 6" x 6" minimum equivalent. (See Figure 14 in Section 9)
   b. WG+E normally will not provide individual metered services to locations in campgrounds and marinas used for transient purposes.

## I. Self-Contained Three-Phase Meter Installations (Also see Section 6-B.2)

1. Meter Equipment
   a. Approved sockets are required for all 208Y/120 volt and 480Y/277 volt three-phase, four wire, wye installations up to 320 AMP.
   b. The Customer shall furnish, install, own, and maintain approved, three phase ringless sockets with factory installed lever operated bypass and jaw release, complete with flash shield and sealing provision. For the latest list of approved meter sockets, contact our Engineering Department.
      i. Where damage occurs or is anticipated, the Customer may be required to provide approved meter protection.
2. Meter Socket Connections

   Line side conductors are always connected to the top terminals of meter sockets and the load-side conductors to the bottom terminals.

3. Wiring Trough with sealing provisions may NOT be used to feed multiple installations of meter sockets.

## J. Instrument Transformer Meter Installations (Also see Section 6-B.2)

**EVERY INSTALLATION WHICH MAY INVOLVE INSTRUMENT TRANSFORMERS SHALL BE REFERRED TO THE DEPARTMENT FOR APPROVAL BEFORE WORK IS STARTED.**

1. Metering Equipment
    a. Instrument Transformers and Enclosures
    WG+E will furnish, own, and maintain instrument transformers. The Customer will install current and voltage transformers (when required), except in special metering installations. In all cases, WG+E will wire from transformers to meters.

    The Customer shall install a sealable metal enclosure for the instrument transformers. This enclosure may be:

    - an individual cabinet for instrument transformers only
    - a combined entrance switch and current transformer enclosure
    - or a separate compartment in metal-enclosed switchgear. Wiring in the instrument transformer cabinet shall be limited to that pertinent to the meter installation.

    All the above will be of, **Cold Sequence**. (See Figure 16 in Section 9)

    b. Meters and Test Switches – except Residential

    WG+E will furnish a 16-jaw meter socket for use with instrument transformers to be installed by the Customer and wired by WG+E.

2. All Electric Meters will be installed outside, unless other arrangements have been made with the Department.
    a. Approved Enclosures
        i. For the latest list of approved enclosures, contact the Department.
3. Sequence of Meter and Service Equipment
    a. For instrument transformer installations, the Customer shall furnish, install, own, and maintain a main switch or circuit breaker on the line side of the instrument transformers. (See Figure 16 in Section 9) Contact the Department for any exceptions.

4. Instrument Transformer, Test Switch, and Meter Connections
    a. The Department will:
        i. Furnish, install, own, and maintain the secondary conductors, and test switches required by the installation of instrument transformers.
        ii. Make all connections to voltage transformers.
    b. The Customer will:
        i. Provide adequate support for the current transformers and service conductors.
        **ii. THE CONNECTION OF CUSTOMER EQUIPMENT TO THE METERS OR TO THE SECONDARY OF INSTRUMENT / TRANSFORMERS IS NOT PERMITTED.**

## K. Submetering

In Massachusetts, electric submetering is prohibited because it is the resale of electricity. Residential property owners are required by the state sanitary code to pay for electricity for each unit unless the unit has a separate meter that is installed, maintained, and read by a utility company and a written rental agreement between the owner and the tenant provides for payment by the tenant in rent.

www.mass.gov

[ END OF SECTION 6 ]

# Section 7 - Your Utilization Equipment

## A. General

1. The Department reserves the right to disconnect Customer supply, upon proper notice, when Customer equipment interferes with the operation of any components of the Department's system or the electric supply to others. The Customer must consult with the Department in advance of making commitments for large motors, welders, x-ray machines, or other equipment which may have a high instantaneous electric demand. These types of loads may require additional equipment and design considerations.
2. All loads shall be electrically balanced. On three-phase supply, the load should be evenly divided between the energized conductors.

## B. Motor Installations and Starting Current

1. The starting current of a motor is much greater than the normal running current. The magnitude differs with the motor size and type. While this starting current exists for only a short time, the frequency with which it occurs is a major cause of supply disturbances.
2. Before installing single-phase motors over 3 horsepower or three-phase motors over 20 horsepower, consult with the Department for assurance of adequate supply.
3. The maximum locked-rotor current anticipated shall be the sum of the starting currents of all motors which are started simultaneously.
4. WG+E will specify motor starting limitations. When required, reduced voltage starters or other devices must be furnished, installed, owned, and maintained by the Customer.

## C. Motor Protective Devices

1. All motors shall be controlled and protected from damage that could be caused by continued operation under abnormal conditions such as single phasing. WG+E is not responsible for equipment damage.
2. There are advantages to incorporating timed under-voltage releases for motors on certain applications. Due to the normal, rapid reclosure of our supply circuit breakers, many manual restarts can be avoided by delaying the opening of the motor contactor. Conversely, some devices or processes require disconnection immediately upon loss of voltage in order to protect the operation involved.

## D. Power Factor

Where any equipment having low power factor characteristics is installed, it is to the Customer's advantage to furnish, install, own, and maintain corrective equipment which will result in an overall power factor approaching unity. This will improve voltage regulation and reduce the size of the required electrical equipment.

## E. System Disturbances

Certain electronic equipment, such as computers, microprocessors, and some manufacturing processes, are extremely sensitive to disturbances which are inherent in all supply systems. Therefore, the Customer must furnish, install, own, and maintain equipment needed to protect Customer operations.

[ END OF SECTION 7 ]

# Section 8 - Your Alternate Electric Energy Sources

## A. Non-Parallel Generation (Standby or Emergency)

When using emergency generation, an adequately sized double-throw disconnecting device must be provided by the Customer to open all ungrounded conductors from the normal supply before connection is made to the emergency supply, in accordance with the requirements of the Code. (See Figure 20 in Section 9)

## B. Distributed Generation

The Customer must contact us early in the planning process and receive written approval to install generation. Please visit the WG+E website to view the guidelines and requirements for interconnection of any non-utility generation and for contact information.

www.wgeld.org/pages/resources/solar

**WG+E does not offer net metering.**

In January 2017, WG+E began offering the 'Buy All Sell All' reimbursement program to new Distributed Generation customers. In the 'Buy All Sell All' design, the customer buys all of their load from WG+E at the current residential rate and sells all of their generation to WG+E at the 'Buy All Sell All' rate in the form of a credit at the current rate per kWh.

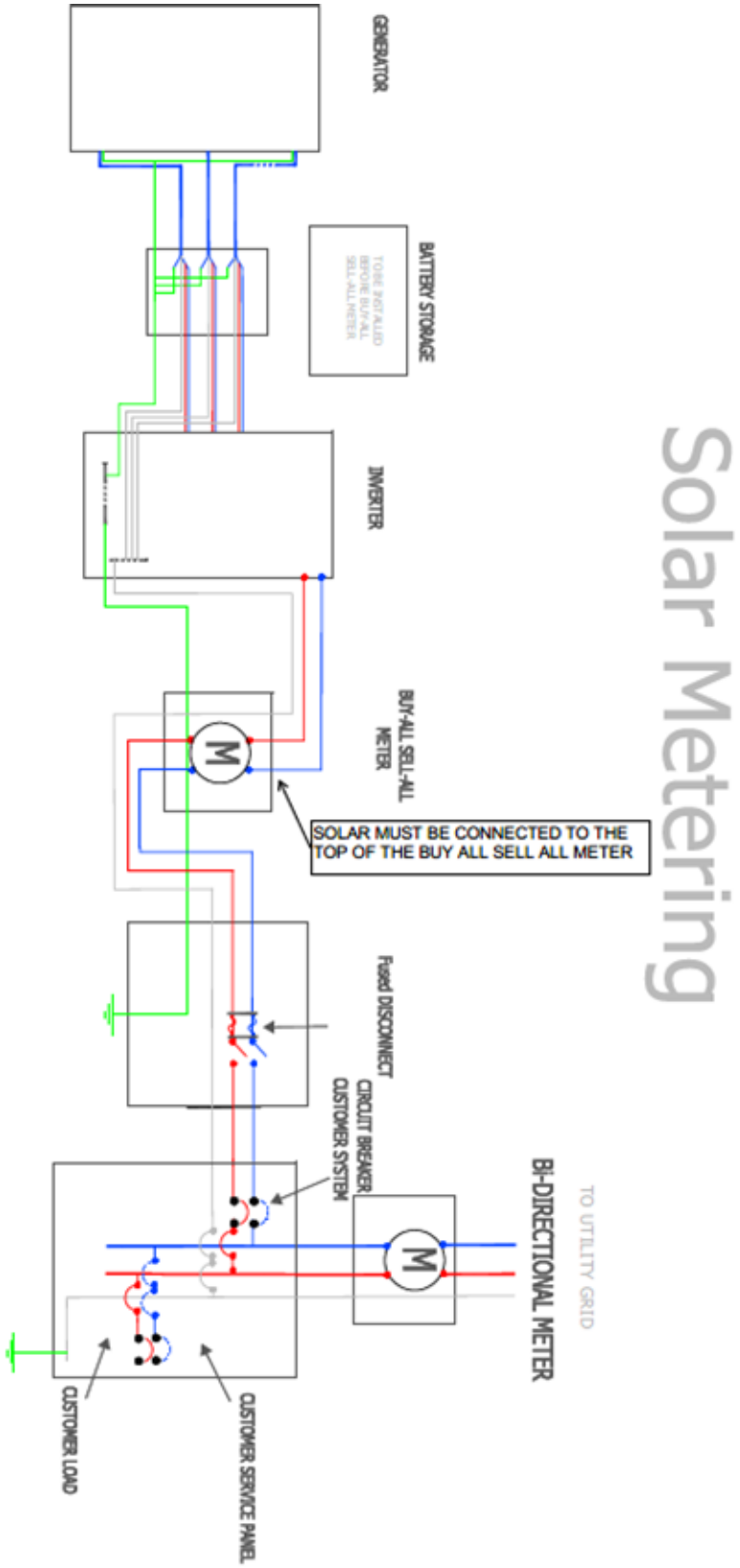
The additional revenue quality meter that is required for the 'Buy All Sell All' program will be billed to the Customer monthly.

[ END OF SECTION 8 ]

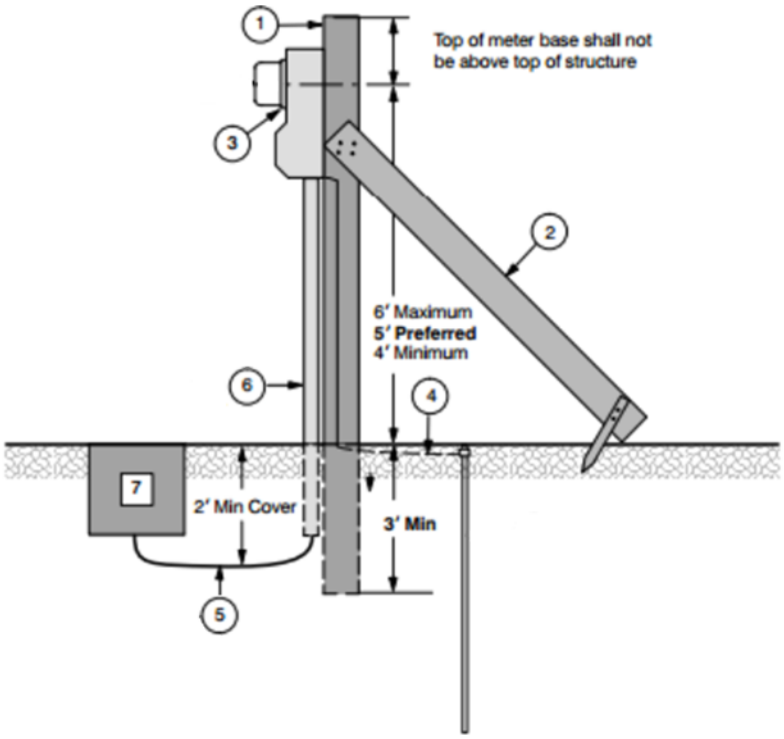
# Section 9 - Illustrations

This section contains drawings of the general arrangement for much of the subject matter in the preceding sections. The Department does not intend that these sketches be complete in all detail. Rather, they typify the essentials.

FIGURE 1: Solar Metering



# FIGURE 2: Temporary Electric Service Underground




SEE NUMBER REFERENCES ON THE FOLLOWING PAGE

# TEMPORARY SERVICE FROM UNDERGROUND SYSTEM

WG+E will dead-end our conductors for temporary electric service on a timber which is to be erected by the Customer and is to meet the requirements listed below.

1. Location of temporary service timber is to be specified by the Department. Service must be 10' maximum from the handhole or transformer location unless permanent service conductors are used for the temporary service.
   a. The timber is to be structural grade fir or pine with cross-section not less than nominal solid 6" x 6" or two 2" x 8" spiked together on 8" centers.
   b. The temporary service timber is to be at least 10 feet long.
   c. The temporary service timber is to be set a minimum of 3 feet in firm ground with well-tamped backfill.
   d. There is to be no excavation near the temporary service timber which might reduce its stability.
2. 2” X 4” Bracing

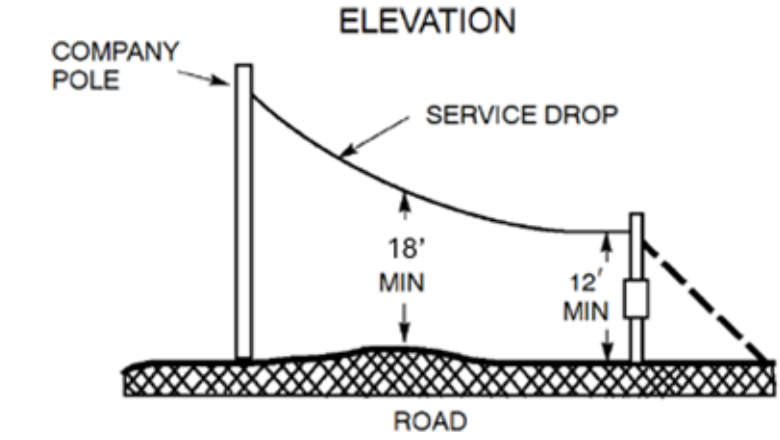
Approved electric service equipment is to be installed to meet the following requirements and to be in accord with the code(s).

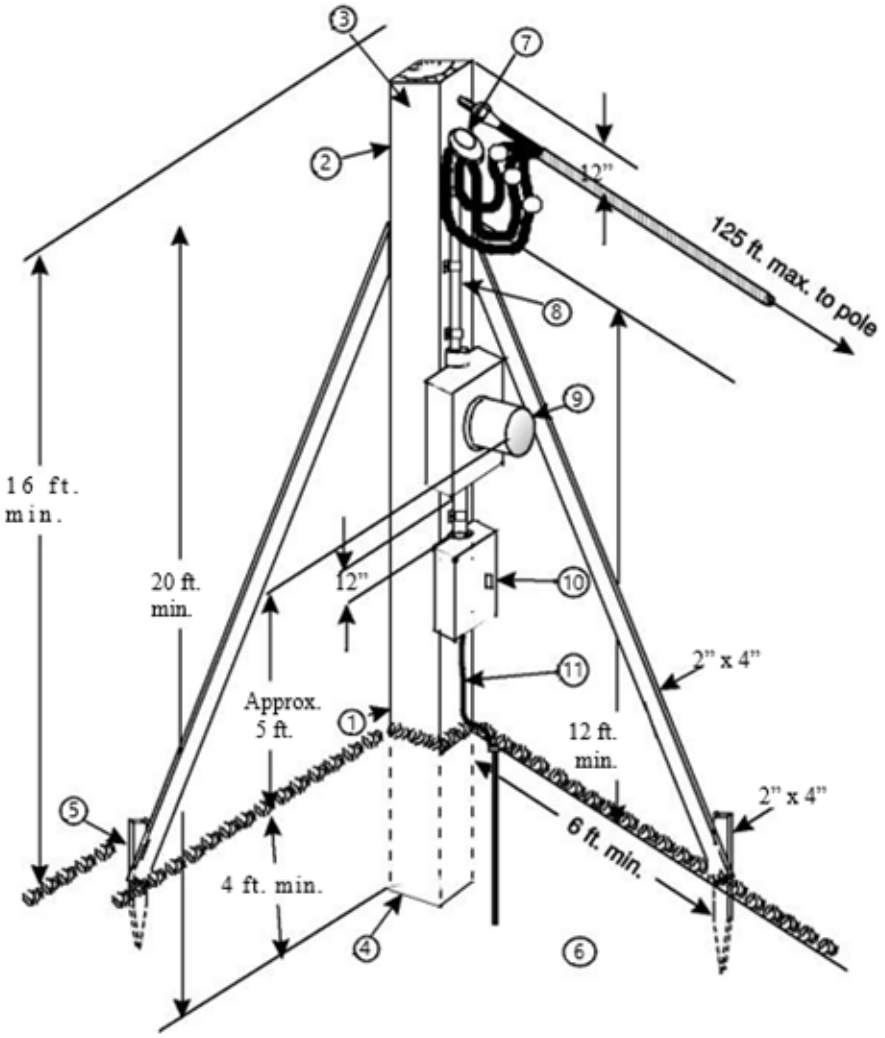
3. An approved meter socket is to be installed approximately 5 feet above ground.
   a. Outdoor type service equipment rated in accordance with the National Electric Code and ground fault circuit interrupter protection in accordance with the National Electric Code are to be installed on load side of meter socket and within 12-inches thereof.
4. System and equipment ground conductor with mechanical protection is to be installed on supply side of neutral at service entrance switch and connected to driven ground consisting of an 8-foot minimum rod of 5/8-inch steel or 1/2-inch non-ferrous material or pipe of 3/4-inch trade size galvanized.
5. Service cable will be provided by the Customer. Trench, including backfill with 24" minimum cover over cable, will be provided by the Customer.
6. Approved type 40 PVC or galvanized steel conduit with bushing.
7. Transformer, handhole, pedestal

**Before connection by WG+E personnel, service must be inspected by local electrical inspector.**

Temporary services are to be connected for a maximum of **one year.**

# FIGURE 3: Temporary Electric Service Overhead




SEE NUMBER REFERENCES ON THE FOLLOWING PAGE.

# TEMPORARY SERVICE FROM OVERHEAD SYSTEM

WG+E will dead-end our service drop for temporary electric service on a pole or timber which is to be erected by the Customer and is to meet the requirements listed below:

1. Location of temporary service pole is to be specified by the Department such that the service drop can later be transferred to the permanent location and the temporary service drop span will not exceed 125 feet.
2. (a) If a timber is used, it is to be structural grade fir or pine with cross-section not less than nominal 6" x 6".
   (b) If a treated southern pine pole is used, it is to be Class 6 or larger.
3. The temporary service pole is to be at least 20 feet long. Additional length may be required in order to provide service drop clearance of 18 feet minimum over the road and driveway and 12 feet minimum over other areas.
4. The temporary service pole is to be set at a minimum of 4 feet in firm ground with well-tamped backfill.
5. The temporary service pole is to be adequately braced to support at its top both a man on a ladder and a service drop tension of 600 pounds. A minimum of two 2" by 4" braces at right angles to each other, with one in line with the service drop, are to be installed. Braces are to be well-spiked flat against the side of the pole at least 12 feet above ground and to solidly driven 2" by 4" stakes 3 feet minimum located 6 feet minimum from the service pole.
6. There is to be no excavation near the temporary service pole or its braces which might reduce its stability.

Approved electric service equipment is to be installed to meet the following requirements and to be in accord with the code(s).

1. A service head is to be installed approximately one foot from the top of pole and 14 feet minimum above ground.
2. Service entrance conductors are to be three-wire #10 AWG minimum with mechanical protection, securely fastened to the pole.
3. An approved meter socket is to be installed approximately 5 feet above ground on the side nearest our pole.
4. Outdoor type service equipment rated in accordance with the National Electric Code, and ground fault circuit interrupter protection in accordance with the National Electric Code are to be installed on load side of meter socket and within 12 inches thereof.
5. System and equipment ground conductor with mechanical protection is to be installed on supply side of neutral at service entrance switch and connected to driven ground consisting of an 8-foot minimum rod of 5/8 inch steel or 1/2-inch non-ferrous material or pipe of 3/4 inch trade size galvanized.
6. Before connection by WG+E personnel, service must be inspected by the local electrical inspector.
7. Temporary services are to be connected for a maximum of one year.

# FIGURE 4: Underground Service

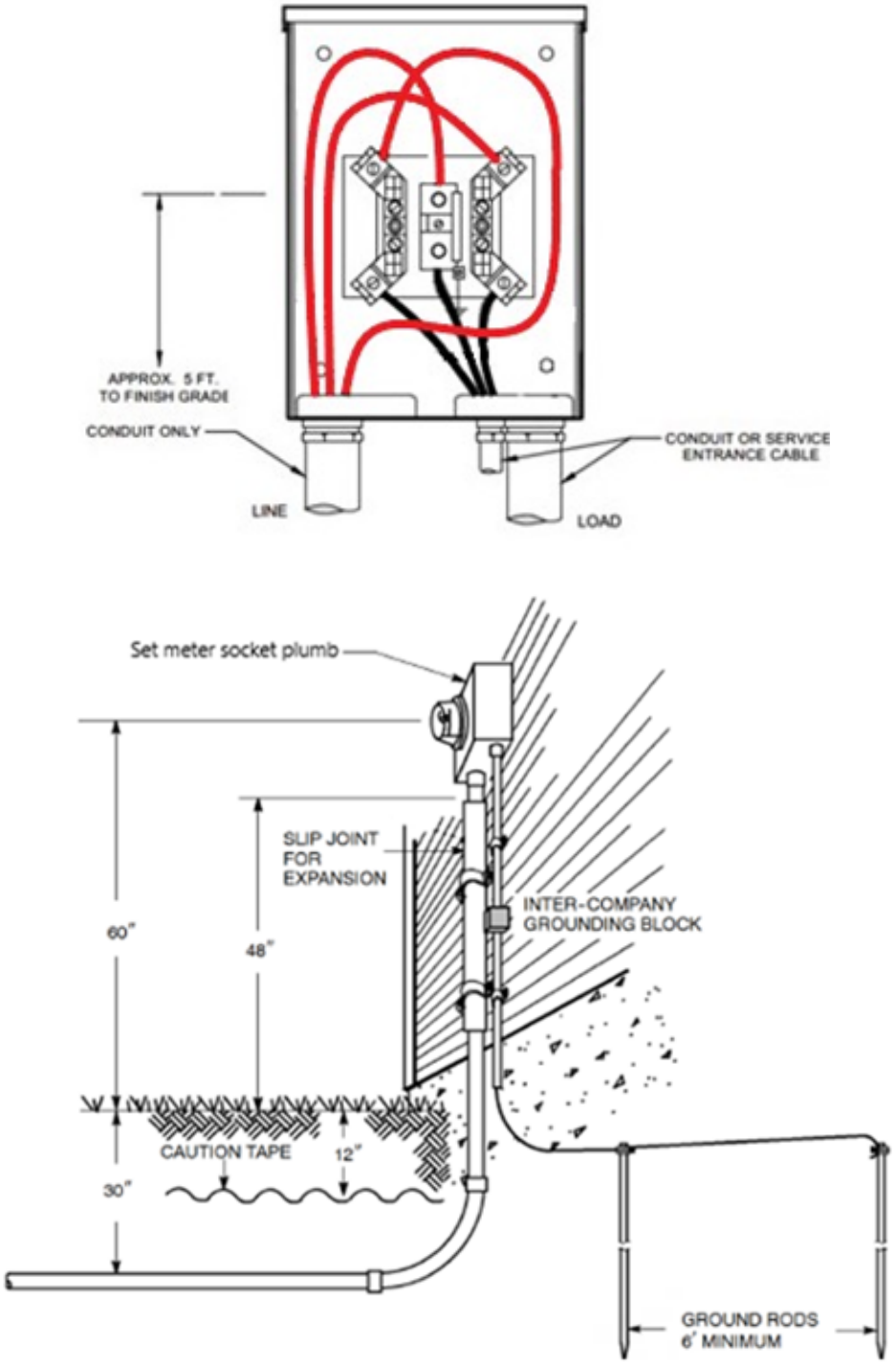
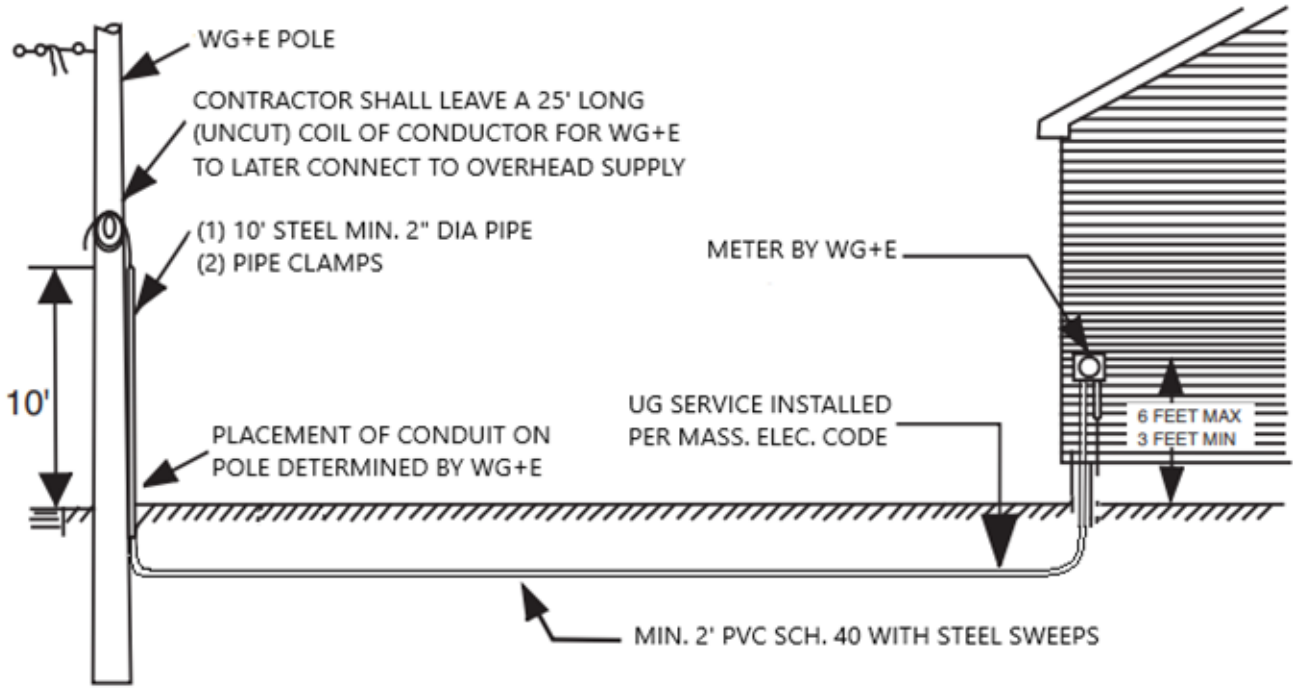
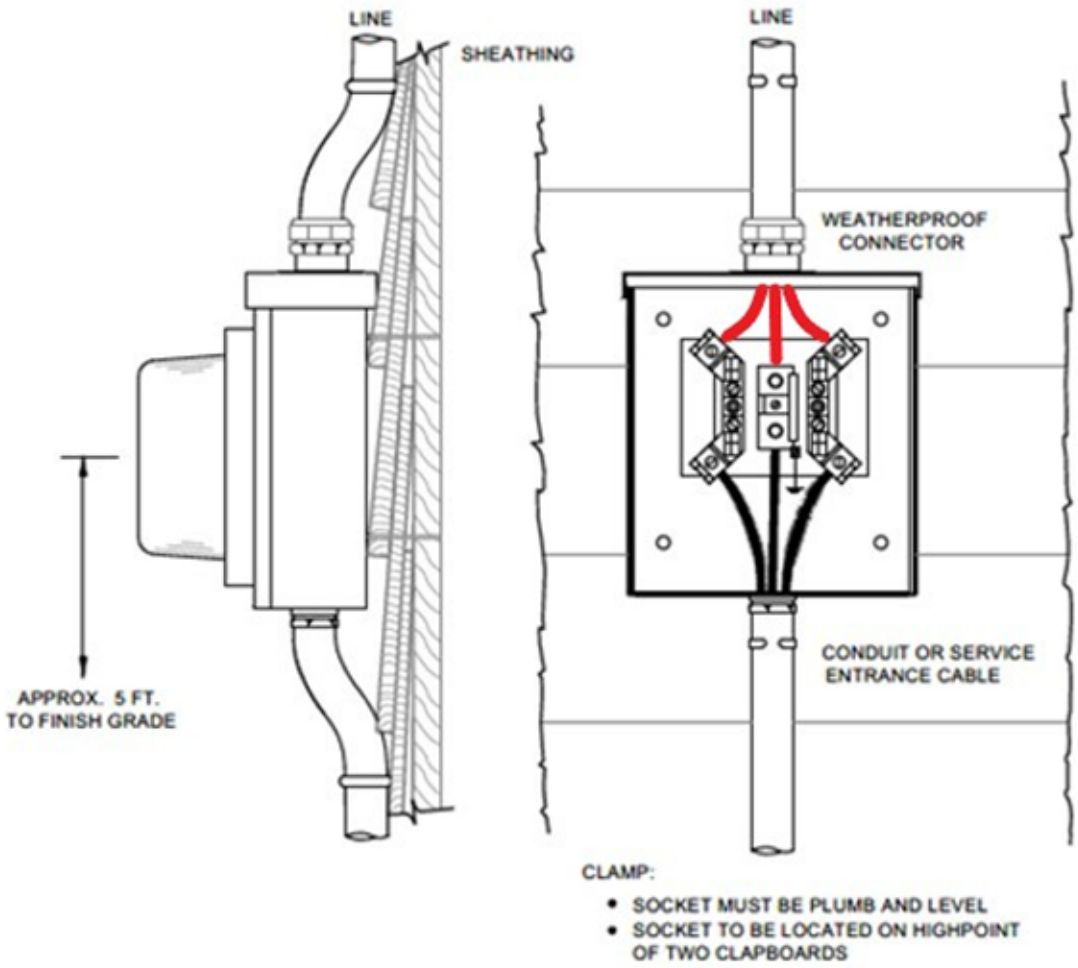


FIGURE 5: Underground Service Lateral From Aerial Distribution Lines



# FIGURE 6: Self-Contained Meter Socket Sequence and Mounting Arrangement

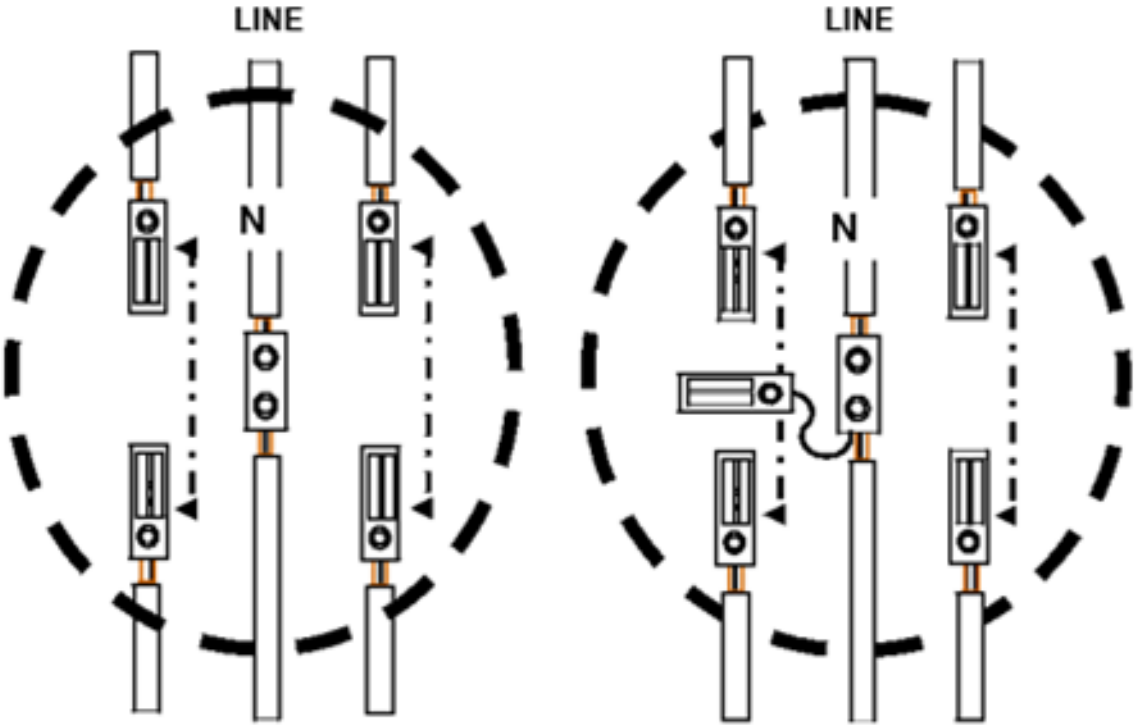



Socket shall be located on the high point of two clapboards or shingles.

Notes:

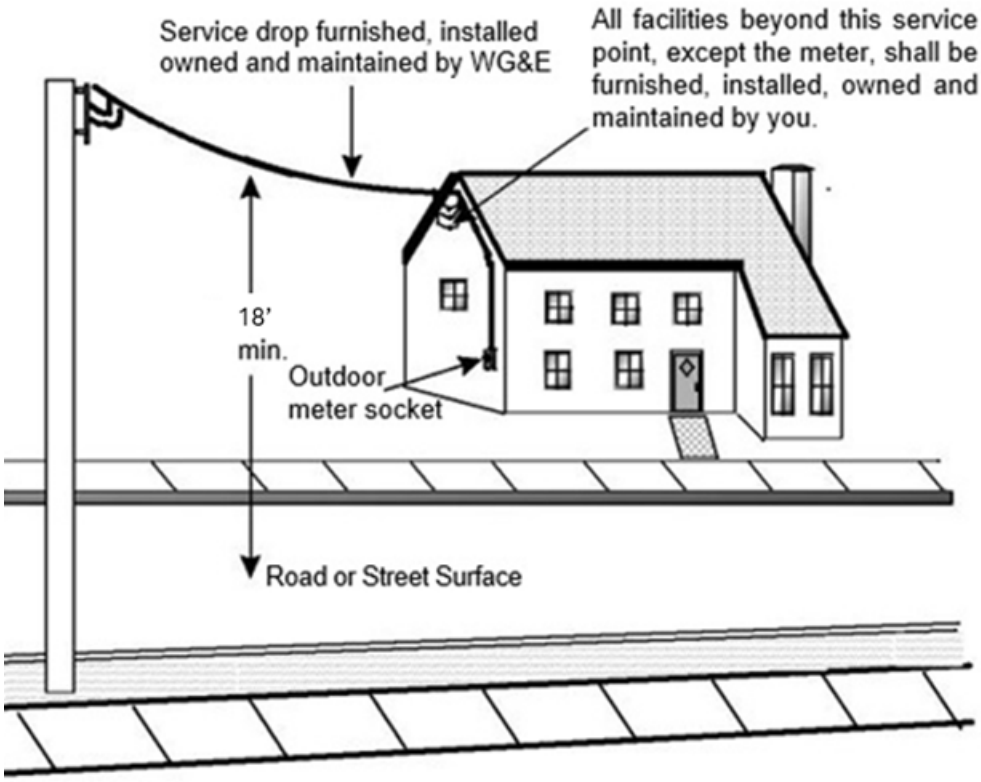
A. Self-contained meter sockets to be used on single phase, network, and three phase services 320 amp and less.
B. All equipment (except meter) furnished, installed, owned and maintained by Customer.
C. Ground in accordance with National Electric Code.
D. No aluminum sealing rings.

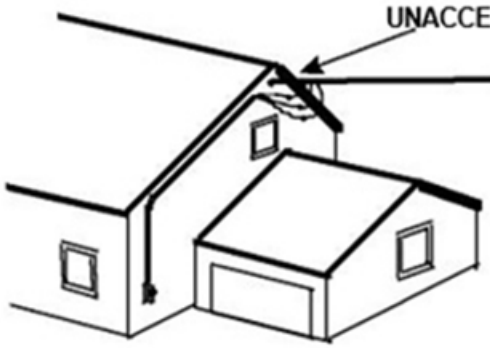
FIGURE 7: Single Phase Self-Contained Metering Connections




| LOAD<br>120/240V | LOAD<br>120/208V |
|---|---|
| SINGLE PHASE, 3 WIRE 4 TERMINAL METER SOCKET | SINGLE PHASE, (NET-WORK) 3 WIRE 5 TERMINAL METER SOCKET |

# FIGURE 8: Overhead Service

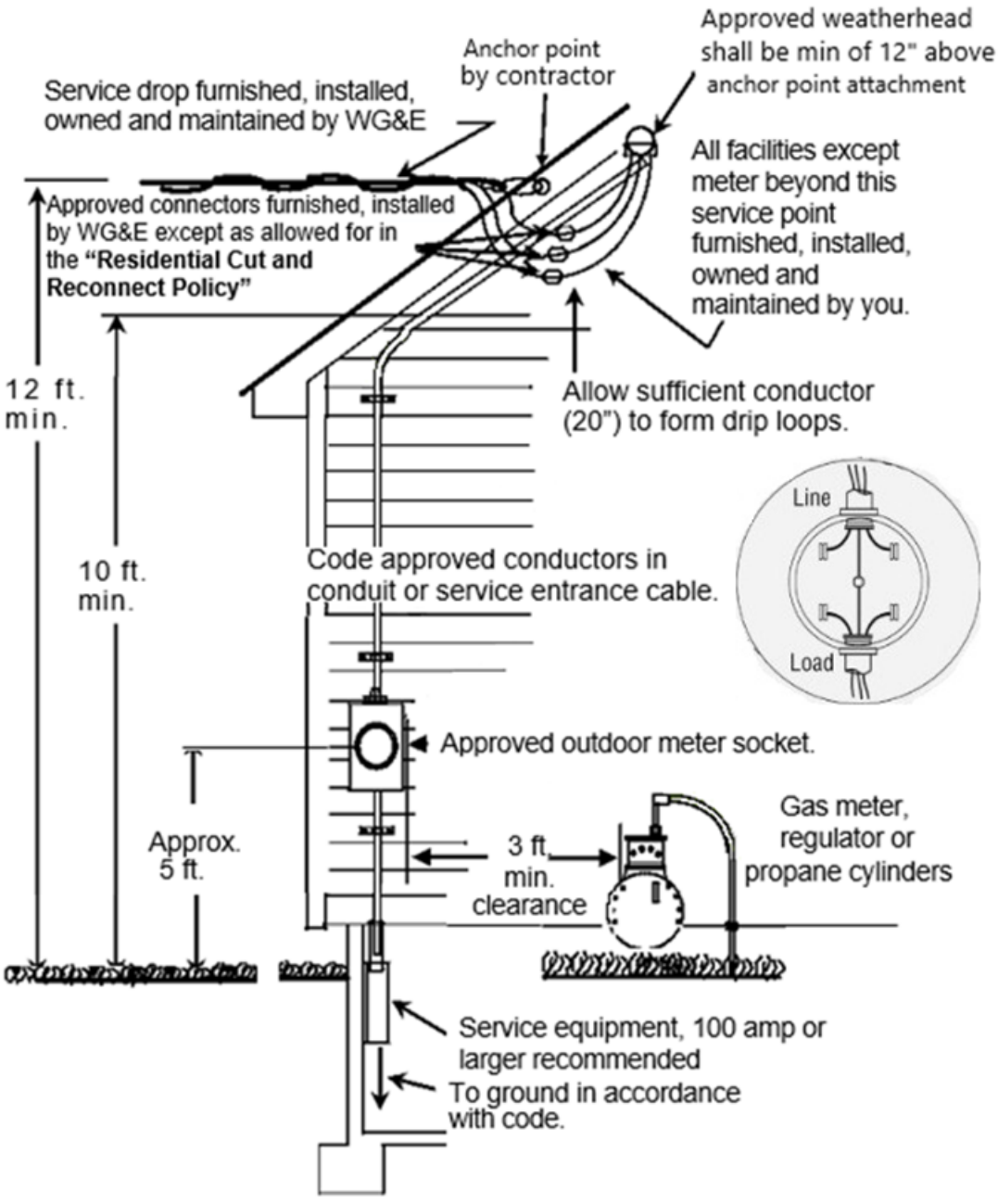


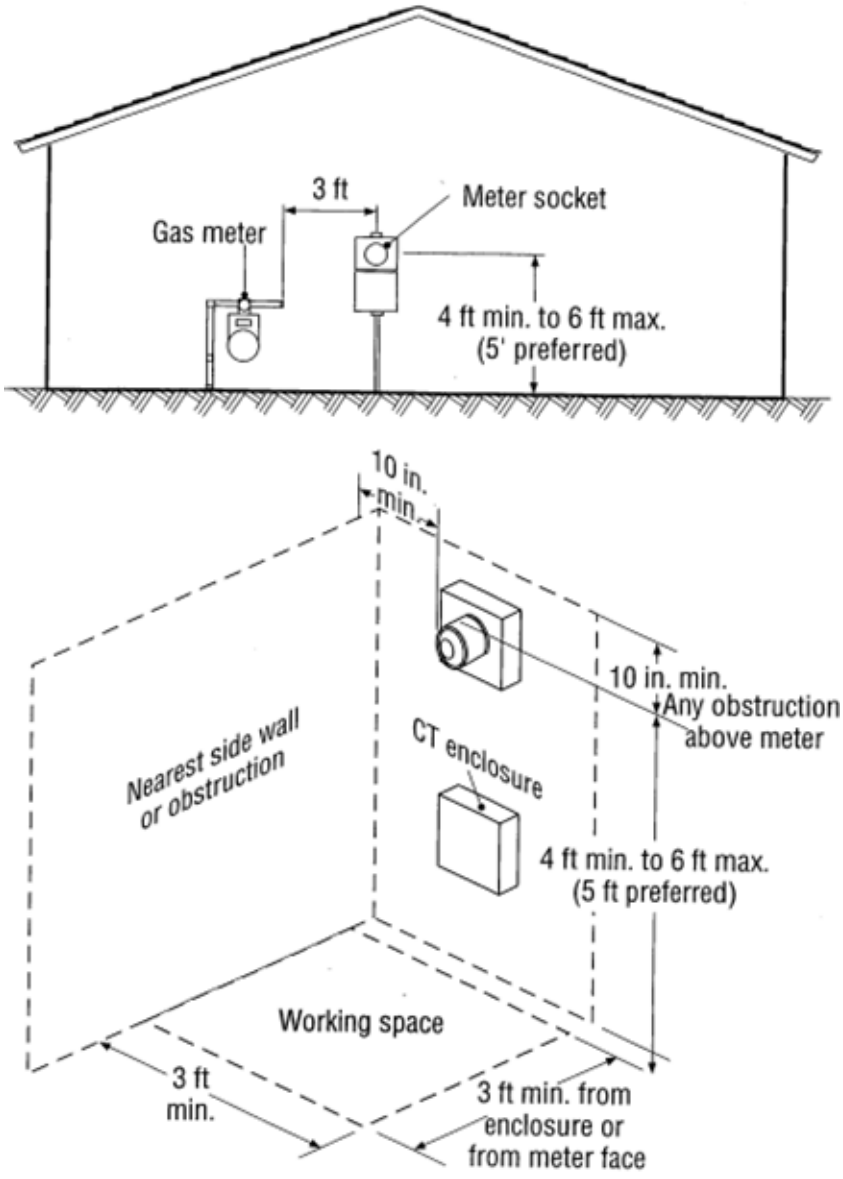

Service point located above building extension as represented in Detail 1 is not acceptable because the service point cannot be directly reached from a ladder placed on the ground.

DETAIL 1

# FIGURE 9: Overhead Service Entrance Facilities



# FIGURE 10: Meter Socket Location

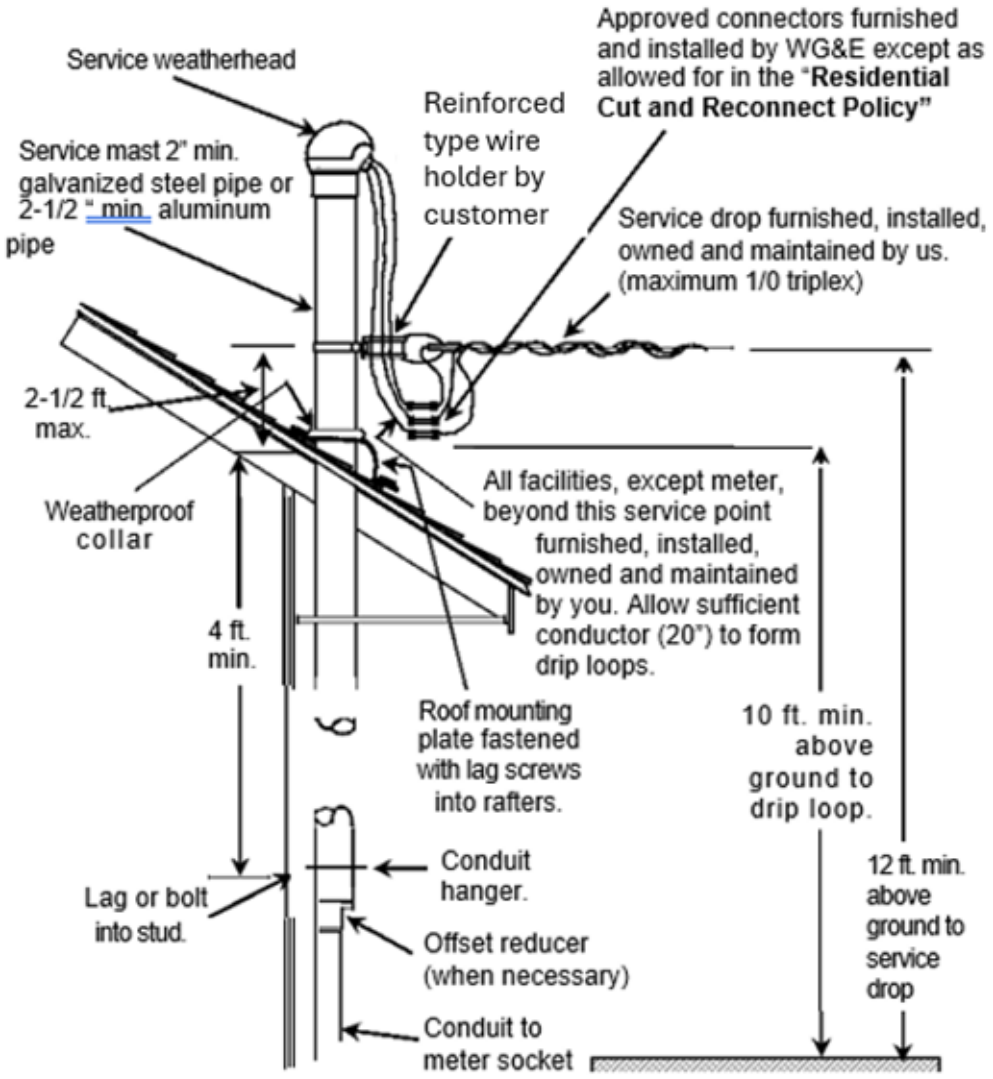



**Note:**

No shrubs, debris, fences, or other structures allowed within the working space.

# FIGURE 11: Service Mast

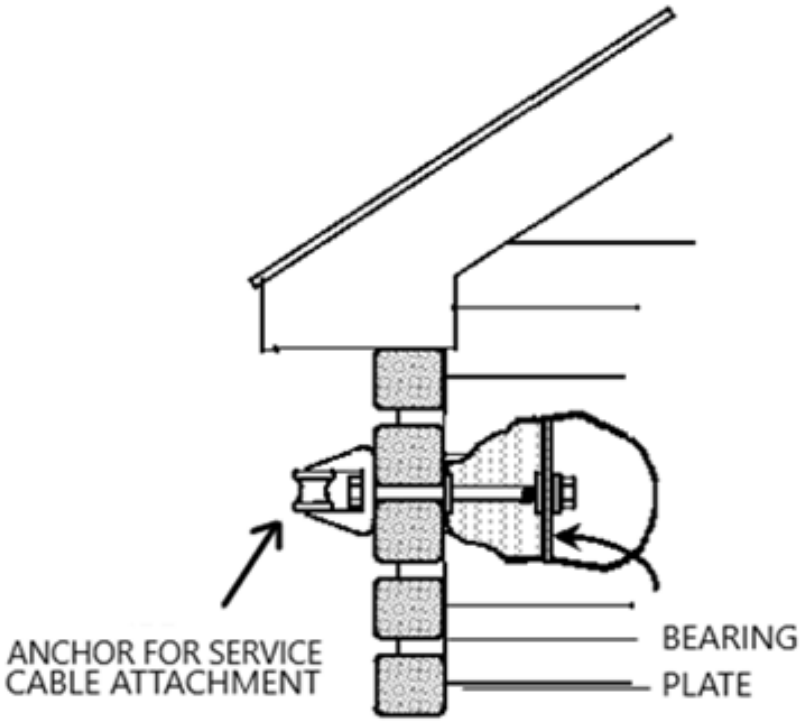
**Illustration is for best practices only and contractor should review requirements with the city electrical inspector.**




**Note:**

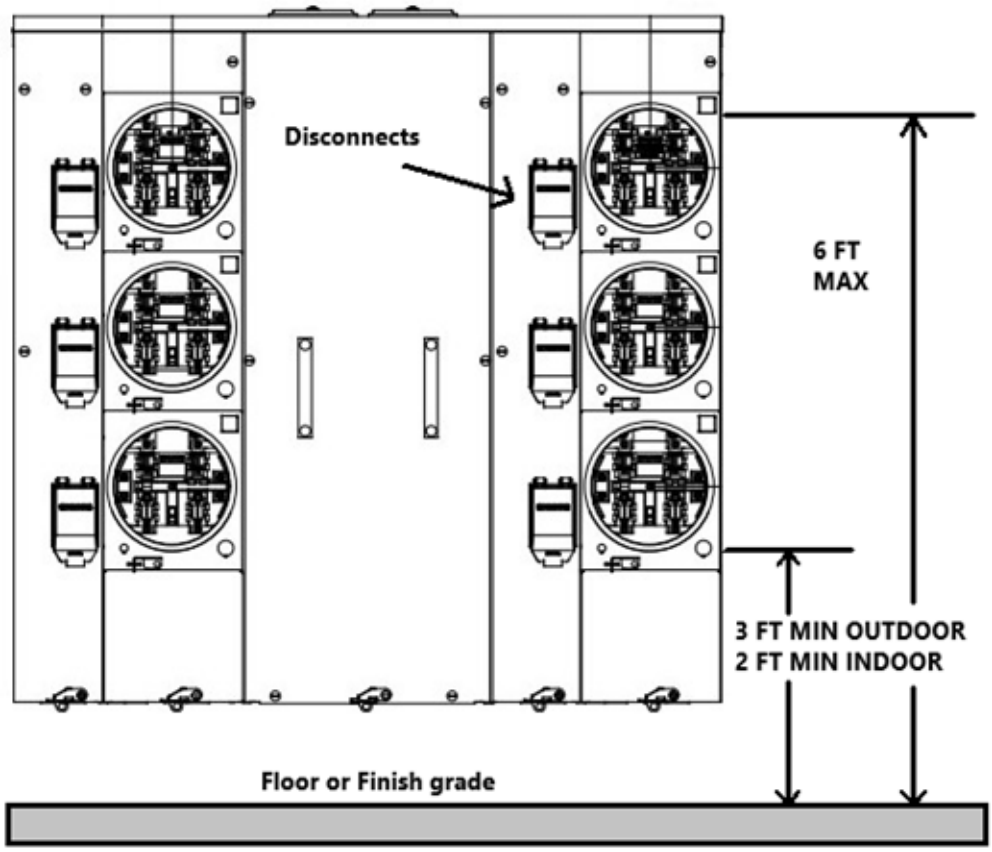
Only power service drop conductors shall be permitted to be attached to the service mast.

FIGURE 12: Service Attachment for Masonry Building




Installation is the responsibility the customer.

# FIGURE 13: Multiple Meter Panels for Group Metering
# Single Phase 120/240v or 120/208v

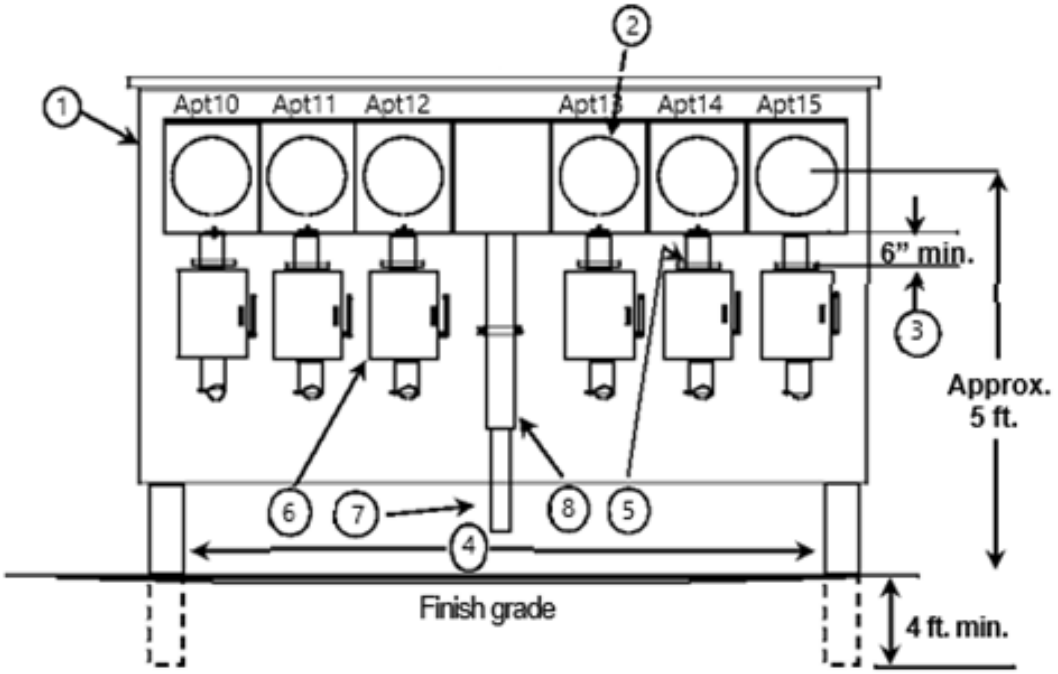



Service Load Disconnects Show Beside Meters May Be Located Below or Above Meters.

Notes:

A. Sketch of panel arrangements must be submitted to the Department for approval prior to installation and layout of equipment.
B. Ground at service equipment in accordance with the National Electric Code.
C. Always notify WG+E before installation, for meter locations and identification specifications.

# FIGURE 14: Modular Home Meter Panels for Group Metering Single Phase 120/240v or 120/208v

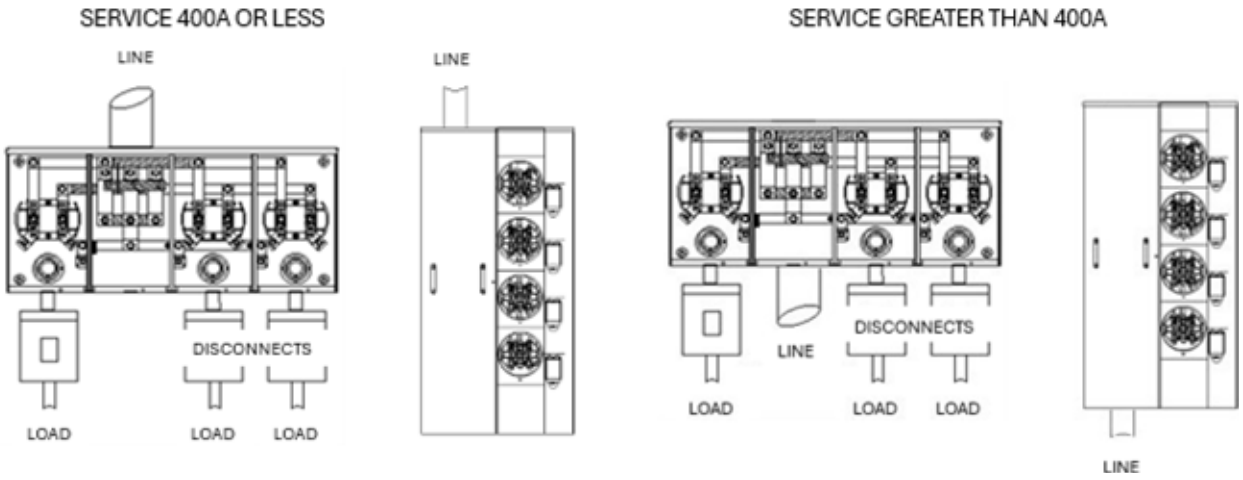



1. Suitable meter backer board
2. Meter socket trough
3. Minimum 6" space between meter socket and service equipment
4. Suitable supports to be galvanized steel in concrete or minimum 6" x 6" treated wood
5. Weatherproof joint
6. Service equipment 200 amps or less for each unit
7. Approved conduit type SCH40 PVC or steel with slip joint; service may be overhead or underground
8. UL listed slip joint

Note:

A. Ground at service equipment in accordance with the National Electric Code.
B. Each meter socket must be permanently identified with a lot or mobile number.
C. Always notify WG+E before installation, for meter locations and identification specifications.

# FIGURE 15: Examples of Vertical & Horizontal Multi Meter Sockets with Disconnects

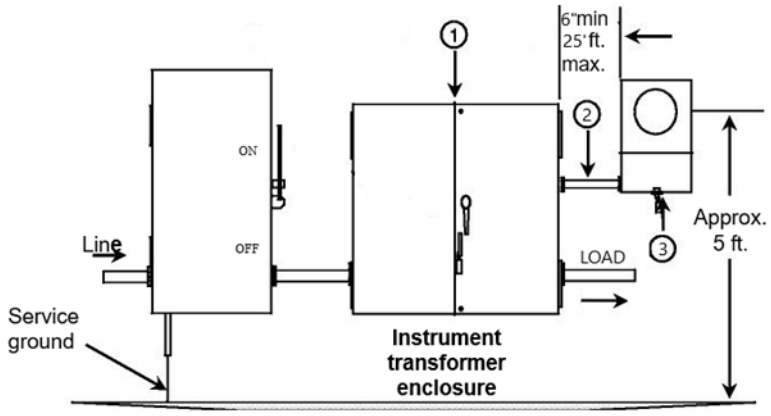



A. Services over 400A must go underground.
B. SE cable from weatherhead to meter socket shall not have any splices. Must be a solid run between the two.
C. Multiple SE cables are allowed at weatherhead, however, WG+E will only make one service connection at weatherhead. Contractor to bug multiple SE cables together if more than one is run.
D. Each premise, meter socket, and load disconnect must be permanently identified before meters will be installed.
E. Ground at service equipment in accordance with local code (City Electrical Inspector).

**Note:**

Trough, gutter boxes, and duct boxes between weather head and meter socket are not allowed.

# FIGURE 16: Instrument Transformer Installation




1. Minimum size of instrument transformer enclosure where current transformer mounting equipment is not required.

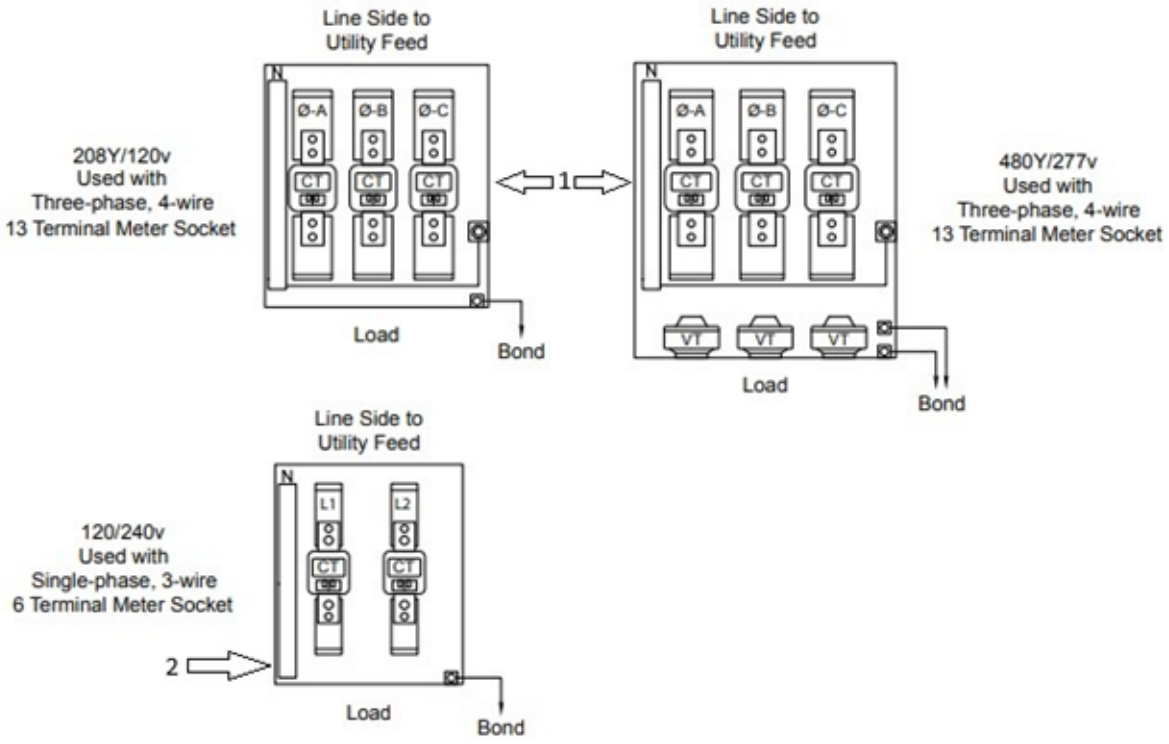
| SERVICE NOMINAL | | ENCLOSURE MINIMUM SIZE | | INSTRUMENT TRANSFORMERS | |
|---|---|---|---|---|---|
| VOLTAGE | WIDTH | HEIGHT | DEPTH | CURRENT | VOLTAGE |
| 208Y/120 | 36” | 36” | 10” | 3 ea. | --- |
| 480Y/120 | 48” | 48” | 10” | 3 ea. | 3 ea. |

2. Conduit to be minimum of 1-1/4 inches in diameter, max. 25 feet in length.
3. Refer to Figure 17 for information on outdoor meter enclosure requirements.

**Notes:**

A. Consult the Department before starting any job where any instrument transformer installation is required.
B. Customer will provide meter board, instrument transformer enclosure, test switch enclosure, conduit for meter wiring and primary connectors for current transformers.
C. Ground at service equipment in accordance with the National Electric Code.
D. Install a grounding connector in the bottom of the instrument transformer enclosure.

# FIGURE 17: Instrument Transformer Connections




1. Instrument transformer enclosure or compartment. Voltage transformers may be installed in a separate enclosure if room is not available in current transformer enclosure.
2. For 120/240 V single phase service. This is the neutral conductor.

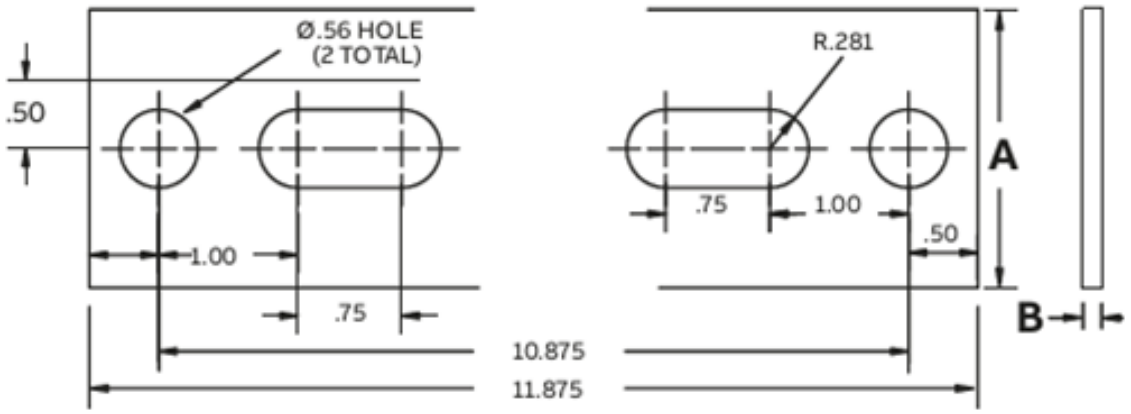
**Notes:** (Refer to Section 6-J1a)

A. For loads over 320 amps.
B. Where multiple conductors or a single conductor is used per phase, as described in section J1A, approved mounting equipment shall be provided for the service conductors and current transformers.
C. Install a grounding connector in the bottom of the instrument transformer enclosure.
D. Contact WG+E Engineering Department regarding CT size, type, and configuration.
E. The maximum conductor size accepted is 500 MCM.

# FIGURE 18: Instrument Transformer Connections under 1200 amps

## Mounting Provisions and Dimensions For Metering Current Transformers Rated 600 Volts <1200 amps

| Primary Amps | A | B |
|---|---|---|
| 50 - 200 | 2.0" | 0.25" |
| > 200 | 2.5" | 0.38" |



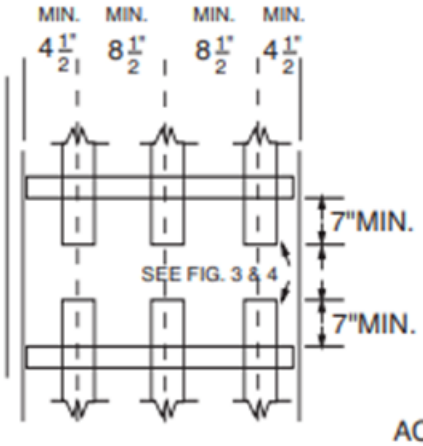




**FIGURE 1**
BUS SPACING
IN CUBICLE

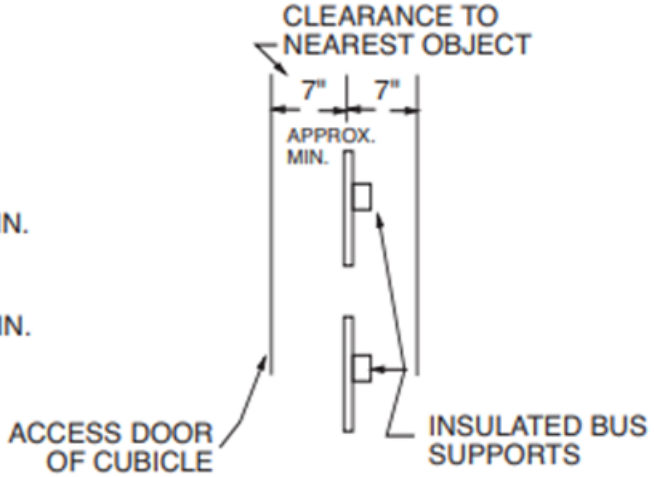



**FIGURE 2**
SIDE VIEW
OF CUBICLE

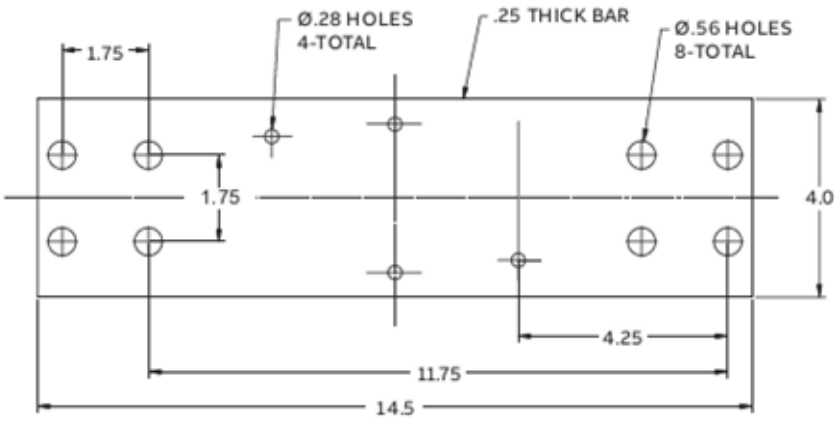
# FIGURE 19: Instrument Transformer Connections over 1200 amps

## Mounting Provisions and Dimensions For Metering Current Transformers Rated 600 Volts >1200 amps

**Primary Bar Assemblies**

| | |
|---|---|
| 800-1500 amps | 1 bar |
| 2000 amps | 2 bars |
| 3000 amps | 3 bars |
| 4000 amps | 4 bars |

**Bar assemblies**



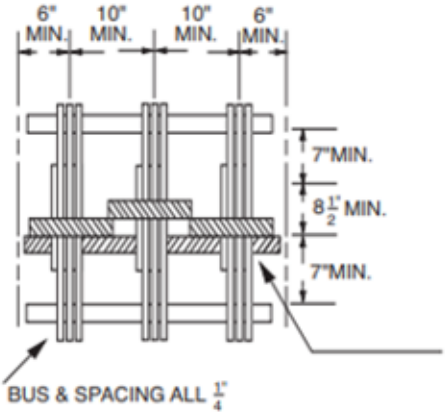




FIGURE 1
ACCESS VIEW OF CUBICLE

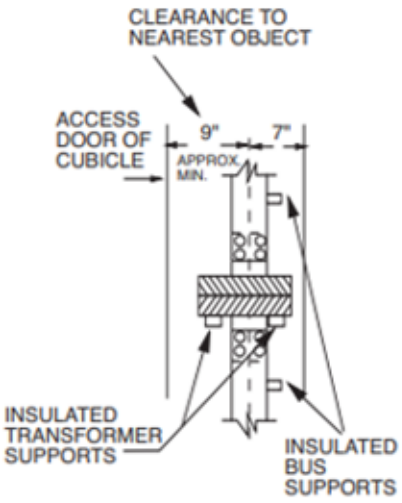



FIGURE 2
SIDE VIEW OF CUBICLE

FIGURE 20: Typical Backup Generator Transfer Switch Configuration

***MUST BE APPROVED BY CITY WIRING INSPECTOR***

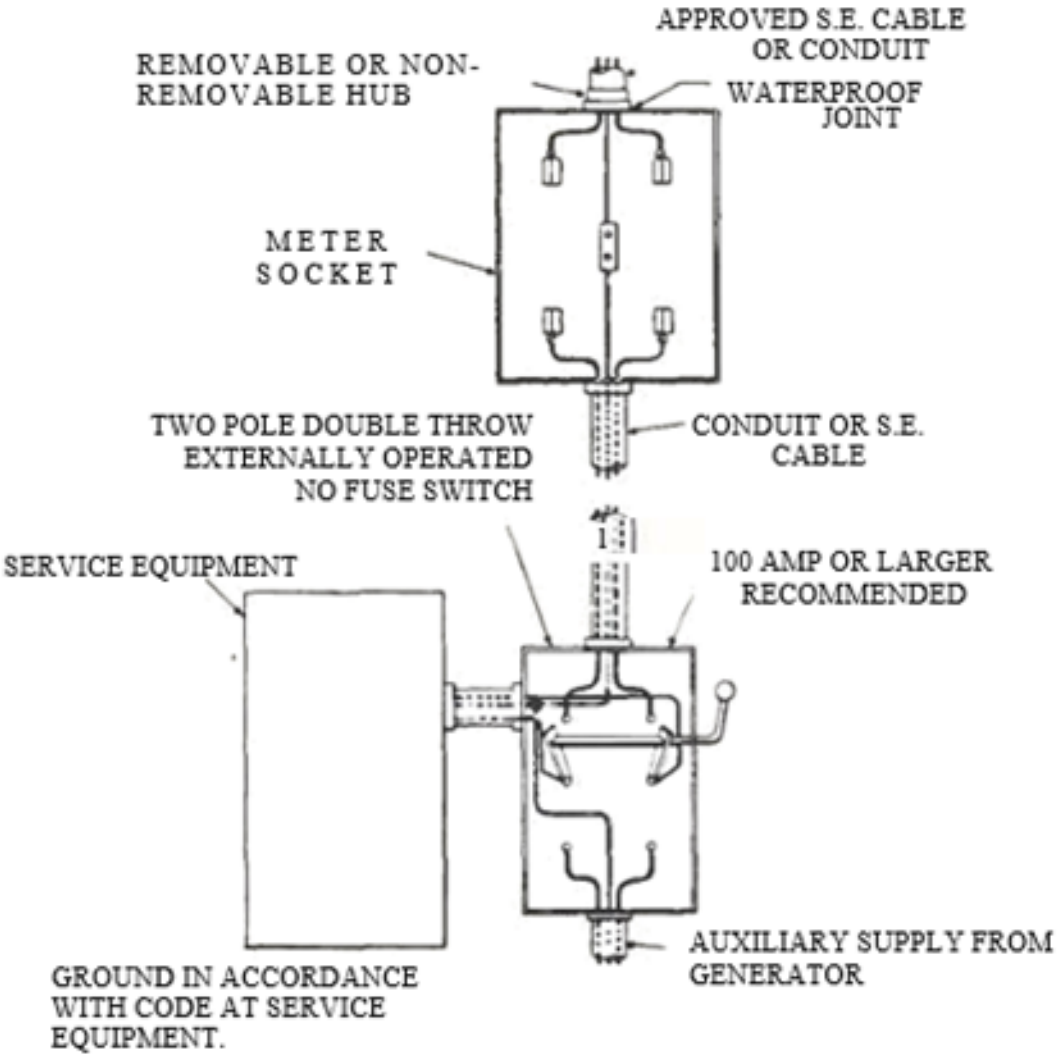
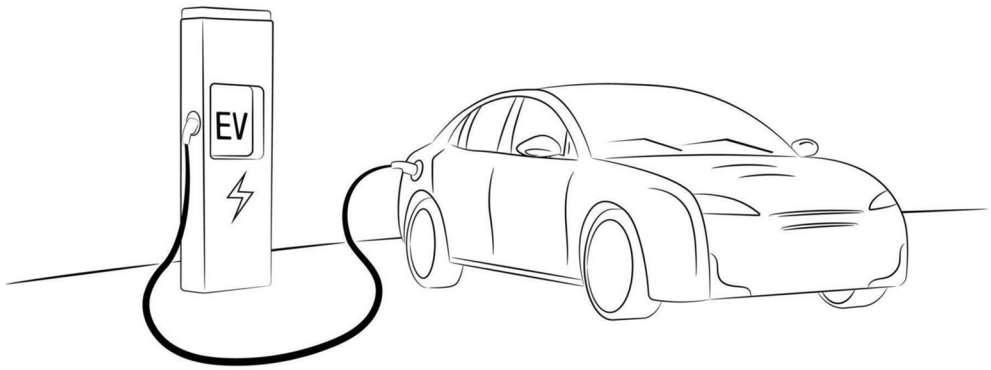


FIGURE 21: EV Car Charging Stations




## *WG+E must approve the stations before installation*

Contact WG+E Engineering Department regarding service installation requirements.

**EV01**: One Level 1 or Level 2 station may be behind the meter with total load not to exceed 49kW.

**EV02:** Total load over 49kW or two or more Level 1 or Level 2 stations will require on a separate utility meter.

**EV03:** DCFC station – requires a separate utility meter.

[ END OF SECTION 9]

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