Requirements for Installation of Electric Services and Meters

RG&E

An AVANGRID Company

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How to Obtain Service

To initiate requests for new services and upgrades:

Call
RGE's Energy Service Installations Department (ESI) directly at 585.724.8666 or 800.743.2110, select Option 3, and then select Option 3

- Or -

Go online to rge.com
- Click on Start/Stop Service
- Click on "Request New Construction" or "Upgrade or Relocate Service"
- Fill out the application completely and click on submit

Completed applications for new services and upgrades can be submitted by email, fax, or mail.

Email	rge_esi@rge.com
Fax	844.515.1574
Mail	Rochester Gas and Electric 180 South Clinton Avenue Rochester, NY 14604 Attention: West Ave/ESI Department

The company is not responsible for errors resulting from the oral transmission of information.

Non-Residential Customer/Contractor Responsibilities
(Refer to Section 4 for additional requirements and responsibilities)

1. Complete all written applications and forms accurately and with no missing information. If any information is missing, the applications and forms will be returned to the customer and the job will not be started.

2. Submit *Service Request* forms describing the proposed electrical installation and expected loads. Include the existing service designation and meter location for rewires or upgrades to the existing service.

3. Request service at least 90 days before date electric service is required. For residential rewires or upgrades, the customer may designate on the Service Request forms the service location, service pole, and meter location if the service remains at the same location and if there are no clearance violations caused by pools, additions, garages, or decks. Where there is a clearance issue or if the attachment is inaccessible by ladder from the ground, the company designates the service location.

4. Provide a security deposit (or sign up for Autopay if option exists based on request submitted) and/or tax-exempt forms (if applicable).

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5. Site plans are required for new constructions and additions. Answer the following question:

   Do you intend to install sub meters at this location?

   If yes, you may be required to submit a petition to the Public Service Commission and receive their approval. All approvals need to be received by the company before service can be energized.

6. Secure appropriate property rights (easements, licenses, permits, etc.) prior to the installation of any electrical service.

7. Contribute to the cost of the service installation and connection to the company's distribution system if the line on private property exceeds the allowance as provided in the *Tariff Schedules for Electric Service.*

Service Request Form Checklist – Rewire/Upgrade of Existing Service

For submittal

√ Fill in all customer and contractor information (if form is incomplete, it will be returned).

√ Check the appropriate application for type of service, phasing, voltage and load information.

For rewires or upgrades of residential overhead services only, the customer/contractor may spot the service location as long as the service meets all four of the conditions indicated in the request form. Check all four boxes and provide appropriate information; fill in the information section and sign the disclaimer. Then check the appropriate box for disconnect/reconnect. If qualified as defined by the NEC, the customer/contractor can disconnect the service on the load side of the company connectors and reconnect with company recommended connectors again on the load side of the company connectors.

The service request will be mailed, emailed or faxed back to the sender with the work management number for inspection, if the customer/contractor is spotting the service.

Note: If residential overhead service or underground service lateral from a pole and the customer/contractor wants the company to spot service location and meter due to obstructions, check the appropriate box (company will then spot job and leave the Instruction for Electricians sheet, along with the work management number, on site).

Figure 1

PROCESS

Service Request Form Checklist – New Service

For submittal

√ Fill in all customer and contractor information (if form is not filled out correctly, it will be returned).

√ Check the appropriate application for type of service, phasing, voltage and load information.

√ Check appropriate box for type heating and cooling load.

√ Fill in remarks area for scheduling and any exceptions requested prior to installation, e.g., meter box location from corner of house, services greater than 250 feet, large loads or the conductor size is different than what the company recommended.

Note: The service request will be mailed or faxed back to the sender with the work management number for inspection, pole number, property corner or transformer number (Service Point) to run service lateral for the company connection.

Please fill out the entire form with appropriate information to avoid a delay in the service installation.

Figure 1

Scheduling Service

Customer/Contractor Responsibilities

1. The inspector from an authority having jurisdiction provides a certificate of electrical inspection. This must occur before the company will connect the new service installation, rewire, or upgrade to the company's distribution system.

2. Once the certificate of electrical inspection is received and on file with RGE:
   A. **New Construction:** The service request will be released so service can be energized and the meter(s) installed.
   B. **Rewires/Upgrades:** Call the Energy Service Installations Department (ESI) Monday through Friday from 7:30 a.m. to 4:30 p.m. to schedule appointment.

SECTION 1 Introduction

Purpose

This booklet contains requirements and responsibilities for making electrical installations that protect the interest of both the customer and the company, and comply with regulations for safe, reliable, and satisfactory service.

In issuing this guide, the company is in no sense relieving its customers of their responsibility to install their wiring in accordance with the National Electrical Code (NEC) and local ordinances, or to maintain their wiring and equipment in a safe operating condition. Customers, or their duly authorized representatives, are fully responsible for approval and acceptance of the wiring, equipment, and timing of their installation. The company is in no way responsible for the design and condition of its customers' wiring and equipment. Customers are responsible for contacting all third parties and to obtain necessary rights-of-way, permits (including environmental and roadway access permits, if required), approvals, inspections, and underground facility locating services for their installation. The company may request documentation from the customer substantiating completion of any such activities.

Customers are responsible for providing and maintaining any facilities necessary to secure their own equipment against disturbances including, but not limited to, loss of phase, loss of neutral, transients, voltage pulses, or harmonic or carrier frequencies whether originating with their own equipment or elsewhere. The company is not responsible for uninterrupted, unreduced, or unimpaired electric service, and therefore, the customer is strongly encouraged to provide adequate protection for computers, solid-state devices, or other voltage-sensitive equipment. Protection may include grounding systems, line filters, solid-state, line-voltage regulators, transient suppressors, isolating transformers, uninterruptible power supply systems, or generators. The company is not responsible for protection of, or liable for damage to, such equipment.

The customers are responsible for the means, methods, and safety of the work of themselves or their contractors, including compliance with all applicable laws, regulations, codes, and ordinances. Customers must secure any necessary licenses, easements, permits, or other property rights as necessary to complete their work.

The customers are responsible for ongoing maintenance of their wiring and equipment in compliance with all regulations, codes, system design changes, and operating changes that pertain to their installation of customers' wires or equipment. The cost for such ongoing maintenance and compliance is the responsibility of the customer.

The adequacy of the wiring, equipment, and protection of customer equipment is the responsibility of the customer. Approval by the company should not be construed to be an approval of the customer's installation in regard to its overall safety or adequacy, but will simply signify that the proposed installation meets the company's minimum requirements under these specifications.

SECTION 1 Introduction

Scope

The requirements in this booklet cover conductors and equipment connecting the company's electric supply system at the customer's service point. It also includes other topics associated with the supply of electricity that are of mutual interest to the company, customers, architects, engineers, and electrical contractors.

Note: It is neither a complete set of specifications governing the installation of electrical wiring and equipment nor does it pertain to services above 600 volts (except as referenced in Sections 3 and 5). However, compliance with all specifications included in this booklet, as well as compliance with the current operating version of the *National Electrical Code (NEC)*, and municipal, state, and federal codes, helps eliminate delays in securing electric service.

Rate Schedule

For rate schedules and rules and regulations, refer to the *Tariff Schedules for Electric Service* on file with the New York State Public Service Commission (PSC). The schedule is available for examination at any customer service office and is available online at **rge.com**. It provides helpful information for the requirements for service and rate schedules.

Cooperation

The company wishes to provide the customer with safe, reliable, and satisfactory electric service in an efficient and courteous manner. The cooperation of customers and their agents is critical in providing safe, reliable, and satisfactory electric service. Accurate preliminary information supplied to the company early in the planning phase of new or enhanced electric service aids the company in ensuring proper scheduling and installation of the electric service.

Responsibility

Adequate electrical capacity of the service equipment is the customer's responsibility. The electrical contractor should assist the customer in determining existing and future needs. The customer is responsible for maintaining customer wiring and equipment in a safe and well protected operating condition. The customer is also responsible for the source of any backup, and any protection of customer equipment and facilities. Changes in connected loads must be reported to the company immediately. The company accepts no responsibility for the customer's wiring and equipment, and will charge for any service provided.

Residential Responsibilities

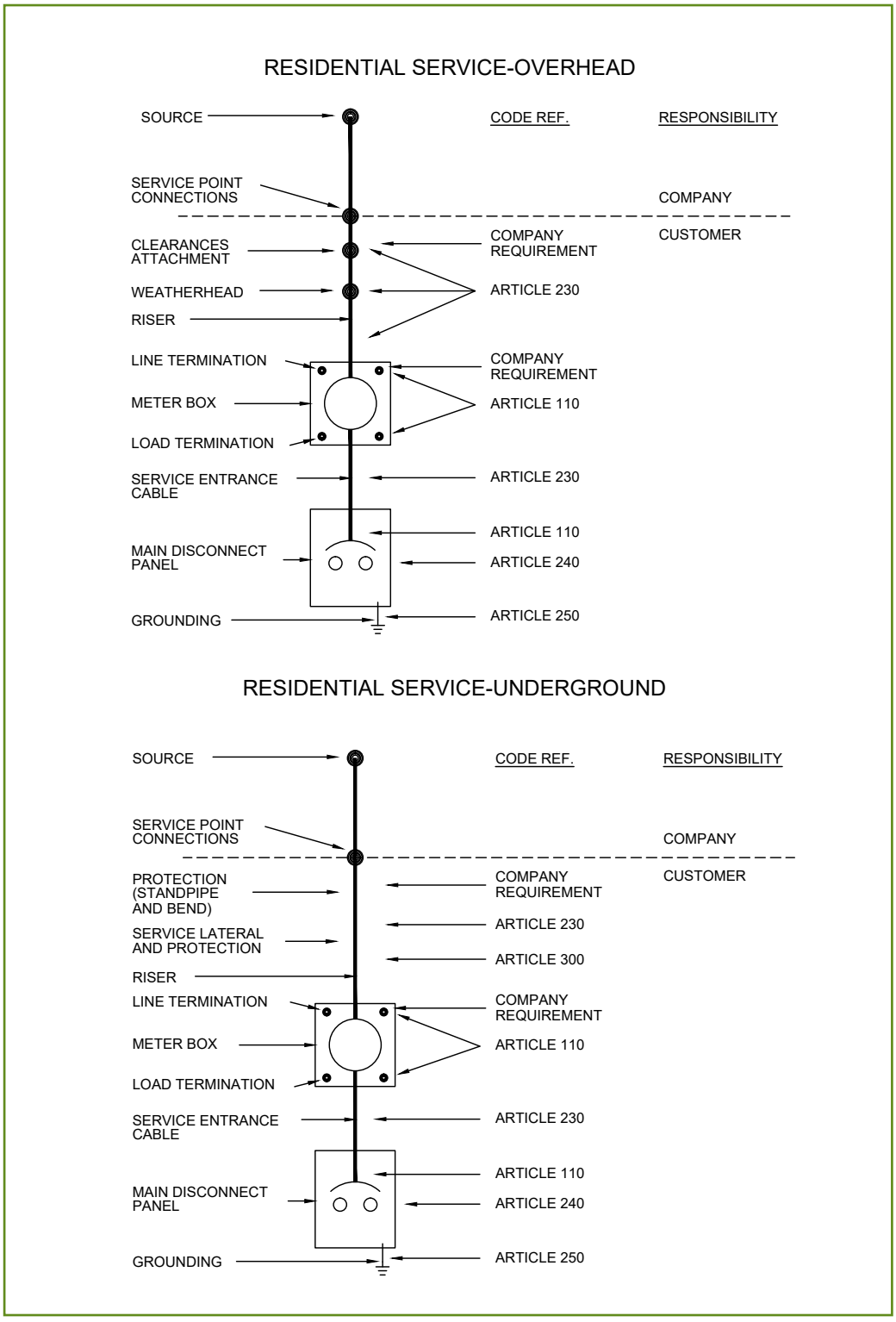


Figure 2

Non-Residential Responsibilities

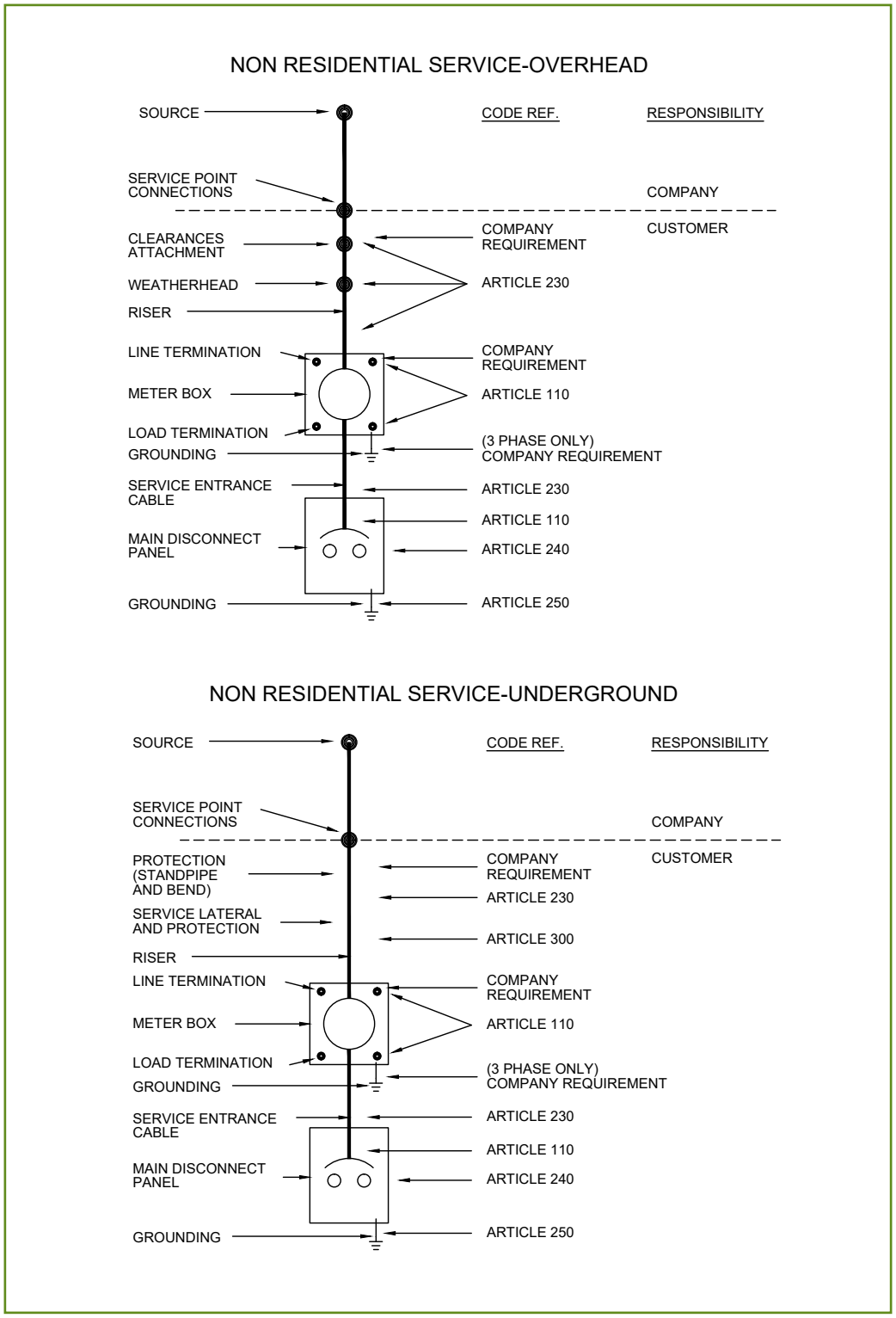


Figure 3

Electrical Inspections

To protect the customer's interests as well as its own, the company requires the customer to furnish, at the customer's expense, an electrical inspection certificate before energizing a new installation or for an upgrade to an existing electric service. Unsafe wiring will be denied service on both inactive and damaged facilities.

The company may also require a re-inspection before re-energizing a service.

The company requires a separate inspection for customer installed, high-voltage underground conduit systems. (Refer to Section 10)

Inspection certificates will only be accepted by the company from agencies approved by the company and the municipality in which the service is located. Inspections must confirm compliance with the current acceptable operational version of the NEC and municipal, county, state or federal codes, and any company specification that may supersede portions of the aforementioned codes. The company reserves the right to challenge the inspection when company personnel observe deficiencies in the installation at any time prior to energizing the service. The company refuses to provide service to unsafe wiring on both inactive and damaged facilities.

Note: These specifications are subject to revision without notice and will be revised or amended as required by developments within the industry to protect the mutual interests of the customer and the company. Additional copies of this booklet and any revisions can be obtained online at **rge.com.**

SECTION 2 Definitions

Accessible, Readily
Capable of being reached quickly for operation, renewal, or inspection without requiring company authorized personnel to step or climb on, over, or remove obstacles.

Accessible by Ladder
Capable of being reached from the ground at level grade with a 24-foot extension ladder.

Accessible Roof
Any roof (or platform) that has a pitch of 4 inches in 12 inches or less, and has accessibility via a window, door, or any other opening allowing access to service connections, conductors, or equipment.

Applicant (Residential Applicant and Non-Residential Applicant)
A Residential Applicant is an individual who requests service at a dwelling for his or her own residential use, or the residential use by another person. For purposes of the *Home Energy Fair Practices Act (HEFPA)*, a residential applicant is any person who requests service at a premises to be used as his or her residence or the residence of another person on whose behalf the person is requesting service, as defined in *16 NYCRR 11.2(a)(3)*.

A Non-Residential Applicant is an individual, corporation, or other entity requesting service from the company who is not a residential applicant, as defined in *16 NYCRR 11*.

Authority Having Jurisdiction
Governmental bodies or their Agents exercising legal jurisdiction over electrical installations. Inspectors must be approved by the municipality in which they are working and by the company, and are responsible for approving service equipment, material, installations, and/or procedures.

Building
A structure that stands alone or that is physically separated from adjoining structures. A utility pole is a structure.

Circuit Breaker
A device installed by the customer designed to open and close a circuit by non automatic means and to open the circuit automatically on predetermined over current without damage to itself, when properly applied and within its load rating.

Clearance
Required separation mandated by codes or the company.

Company
The electric utility or utilities operating within a defined franchise area (this booklet defines the company as Rochester Gas and Electric (RG&E) operating with the authority and approval of Avangrid).

Company Approval
Acceptance by the electric utility or utilities operating within a defined franchise area.

Company Requirements
Additional requirements for the installation of certain service equipment that may or may not supersede portions of the NEC but are required by the company in order to obtain service.

Conduit
A tube, pipe, or duct for enclosing electric cable, usually underground.

Cost and Expense
The cost of all materials and equipment, labor, and other applicable charges associated with work to be performed. These applicable charges include a reasonable percentage for engineering, purchasing, the use of construction equipment, and other costs of a general character.

Customer
A present or prospective user of the company's electric service.
A contractor or developer performing work on behalf of a customer is also considered a customer.

Drip Loop
Individual conductors formed to prevent the entrance of moisture, and that provide adequate length to meet company and code requirements. The company requires 36 inches of additional service conductors to form the drip loop.

Duct (Conduit)
A single enclosed raceway for conductors or cable. A tube or pipe for enclosing electric cable, usually underground.

Electric Service
The conductors and equipment for delivering energy from the company's line to the wiring system (service point) of the customer served. Maintenance of the voltage after the meter is the customer's responsibility.

Electrical Inspector
Inspectors external to the company who are approved by the municipality in which they are working and by the company, and are responsible for ensuring the installation complies with all applicable codes and company requirements, service equipment, material, installations, and/or procedures.

Goose Neck
Type SE service entrance cables installed without a weatherhead shaped in a downward direction (forming a "gooseneck"), and sealed by taping and painting. (Refer to Figure 4)

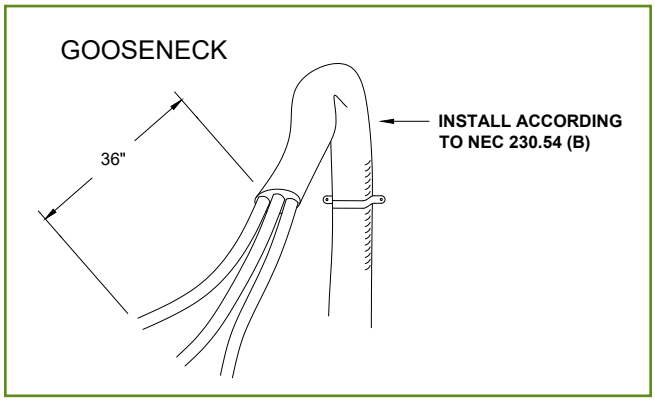


Figure 4

Ground
A conducting connection, whether intentional or accidental,
between an electrical circuit or equipment and the earth, or some conducting body that serves in place of the earth.

Grounding
Connecting to earth or to some conducting body that serves in place of the earth.

Grounding Electrode Conductor
The conductor used to connect the grounding electrode(s) to the equipment grounding conductor, to the grounded conductor, or to both, at the service, at the source of the separately derived system.

Labeling (Suffix)
Identification of load served.

Line
A system of poles or conduits, wires or cables, fixtures and accessory equipment used for the distribution of electricity.

Load Center Pole (Distribution Point) (Refer to NEC 547.2)
Metering pole that feeds a permanent or a temporary load.

Meter Box (Meter Socket Enclosure)
An enclosure comprised of a socket with connectors for line and load conductors and contact jaws to receive the meter terminal blades, thus completing connections between conductors and meter coils.

Meter Box with Bypass Horns
Tabs connected to the meter socket which allow the installation of jumpers to bypass the meter. This allows for the exchange of a meter without any service interruption to the customer.

Meter Box With Lever Bypass
A lever bypass that releases the jaws of the meter socket when in the bypass position, thus enabling the easy installation or removal of the meter without any service interruption to the customer.

Meter Box – Ringless
A meter box in which the cover holds the meter securely in the meter socket without the addition of a locking ring. These boxes require a tab to lock or seal the cover.

Meter – Self Contained
An electric meter in which the full current and voltage passes through the meter from the utility to the customer.

Meter – Transformer or CT Rated
An electric meter that uses step-down voltage and current transformers to accurately meter a customer's load. This type of meter is usually for services over 400 amps.

Mobile Home
A factory-assembled structure or structures equipped with the necessary service connection transportable on its own running gear and designed to be used as a dwelling unit(s) without a permanent foundation (basement).

Panel Board
A single panel, including buses and automatic overcurrent devices, equipped with or without switches for control of the load. Installed by the customer in or against a wall, partition, or other support, and accessible only from the front.

Permanent Foundation
A foundation structure for a mobile home or building to which the mobile home or building is securely attached and not readily moved.

Permanent Sewer System
An installation consisting of an approved septic tank, dry well, and/or leach fields, in compliance with local zoning laws, or connection to a municipal sanitary sewer system.

Permanent Structure
A structure is permanent when it connects to an approved permanent sewer and water system, is not readily moveable, and is in compliance with local zoning laws.

Permanent Water System
A supply of running water derived from connection to a municipal water-piping system, well, or other suitable source.

Point of Attachment
The location of the service drop conductors to a building or structure provided by the customer and installed to maintain clearances specified by the NEC (Article 230) and by the company requirements. Service conductors are mechanically attached to the building or structure (see Section 4). Conductors must be mounted on company-approved knobs as specified by the company. The company requires the point of attachment to be installed prior to providing service.

Premise (Premises)
Discrete contiguous real property under the customer's control through ownership or lease.

Premise Wiring (Premises Wiring)
The interior and exterior wiring that extends from the service point of the company's conductors or sources of power to the outlets, including the meter box and the riser, which are the customer's responsibility.

Right of Way
A portion of land acquired for the construction and operation of electric, or some other facility. It may be owned outright or an easement may be taken for a specific purpose.

Service Connection
A service connection is one service lateral or one service drop and its associated service entrance. Termination of the connection is to the company's distribution system.

Service Drop
The overhead service conductors between the company's last pole or other company's aerial support and the customer's first point of attachment to the building or other structure of the premises served.

Service Entrance
That part of the installation from the point of attachment, or termination of the service drop or lateral, to and including the service equipment on the customer's premises.

Service Entrance Conductors (SE cables)
The service conductors or cable that extend from the point of attachment or termination of the service drop or lateral to the terminal of the service equipment.

Service Equipment
The necessary equipment, usually consisting of circuit breakers or switches and fuses and their accessories, located near the point of entrance of supply conductors to a building and intended to constitute the main control and means of cutoff for the supply to the premises (premise wiring).

Service Heads (Weatherhead)
Service cable equipped with a raintight service head. (Refer to Figures 5 to the right and Figure 6 on page 19.

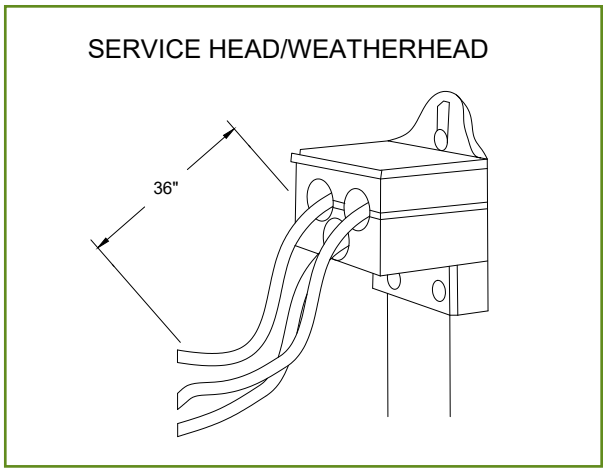


Figure 5

Service Knob
Customer-owned, -installed, and -maintained hardware attaching the service drop to customer equipment.

Service Lateral
A system of underground conductors and equipment delivering electricity from the company's distribution system to the customer's wiring system in a building or premises as defined by the current approved operational edition of the NEC and company requirements.

Service Point
The point of connection between the company's distribution and the customer's wiring (defined by the company).

Temporary Service
Service to be used for a limited time (normally not to exceed one year) for construction, exhibits, decorative lighting, or similar purposes, or service to non-permanent structures.

Underground Commercial Distribution
An underground electrical supply system using at-grade transformers and switchgear to service commercial and industrial customers outside the city network system. Underground service lateral is installed, owned, and maintained by the customer or the company for 600 volts and below.

Underground Residential Distribution
An underground electrical supply system to serve five or more residential customers. Underground service lateral for 600 volts and below is installed, owned, and maintained by the customer.

Voltage Drop
Resistance and/or impedance which may cause a substantial difference between voltage at the service entrance and voltage at the point-of-utilization equipment.

SECTION 3 General Requirements

3 – 1 Access

Access to Customer's Premises and Identification of Employees
The company's authorized employees or agents must have access, at all times, to its meters and equipment installed on the customer's premises.

The company furnishes employees or authorized agents with a company identification badge, which will be shown on request when accessing a customer's premises.

3 – 2 Electric Service

Type of Electric Service
The company supplies alternating current at a nominal frequency of 60 hertz. All voltages referenced in this booklet are nominal.

Character of Electric Service
The company designates the character of electric service.

The service voltage, number of phases, and wires depend on available lines, the customer's location, and the size and nature of the proposed service.

All types of systems are not available at all locations.

Available voltages and characteristics of service are normally considered to be those voltages and types of service that exist at the customer's location. Generally, only one service voltage is provided to a particular location. A second service to a premise(s) is chargeable.

The customer must consult with the company to determine the type of service to be provided before proceeding with the installation of wiring or ordering of electrical equipment.

New Service Less Than 600 Volts

Service is supplied at the company's option.

Phase	Wires	Nominal Voltage	Overhead	Underground
1	3	120/240 (a)	Yes	Yes
1	3	120/208 (a)*	Yes	Yes
3	4	208WYE/120	Yes	Yes
3	4	240Delta/120 (b)	Yes	No
3	4	480WYE/277	Yes (c)	Yes
3	3	480DELTA(d)	Yes	No
3	3	480DELTA/padmount	No	Yes

**5th jaw is required in the meter box for this type of voltage and is furnished and installed by the customer.*

Additional types of service may be unavailable at some locations:

(a) Not supplied for loads exceeding 100kva
(b) Not supplied for loads exceeding 150kva
(c) Not supplied for loads exceeding 500kva Minimum load required of 75kva
(d) Overhead distribution only
(d) Not supplied for loads exceeding 500kva, 800 amps

All loads in excess of 500kva must be served from a pad-mounted transformer and require underground service connections.

Existing services that are not covered by, or exceed, limits listed require a different voltage selection when expansion is necessary.

Service Greater Than 600 Volts
Service greater than 600 volts is supplied where conditions warrant. The company designates the type of service available.

Service to Multi-story Building
Service to multi-story buildings is at basement or ground floor level only. Meters may be located on upper floors. Consult the company before purchasing and installing this type of metering system.

Temporary Service
The company provides temporary electric service for construction purposes, non-permanent usage, or other non-recurring uses at a charge in accordance with the *Tariff Schedules for Electric Service*. Cost authorization is required prior to installation.

The company reserves the right to serve additional customers from temporary lines.

The service entrance must be installed in the same manner as required for permanent installations. Inspection and approval is required prior to energizing the electric service.

Connections
All connections between company conductors, three-phase padmounts, and premise wiring are made and removed exclusively by company authorized personnel.

Connection to the company's electric supply or any alteration of existing connections by anyone except company-authorized personnel is prohibited by New York State. The law provides that the user of an unauthorized connection is presumed to have made, or consented to, that unauthorized connection and is subject to prosecution. The party making the unlawful connection is also subject to prosecution. The company stresses that the performance of working on company equipment or property must be done only by company authorized personnel.

Qualified persons (as defined in the NEC) who wish to do their own disconnect/reconnect must submit a signed service request to the company and must follow all safety and technical rules and regulations, and are responsible for any damages incurred as a result of their actions or inactions. Connections must be on the load side of the utility connectors (customer service entrance cable is for residential overhead only).

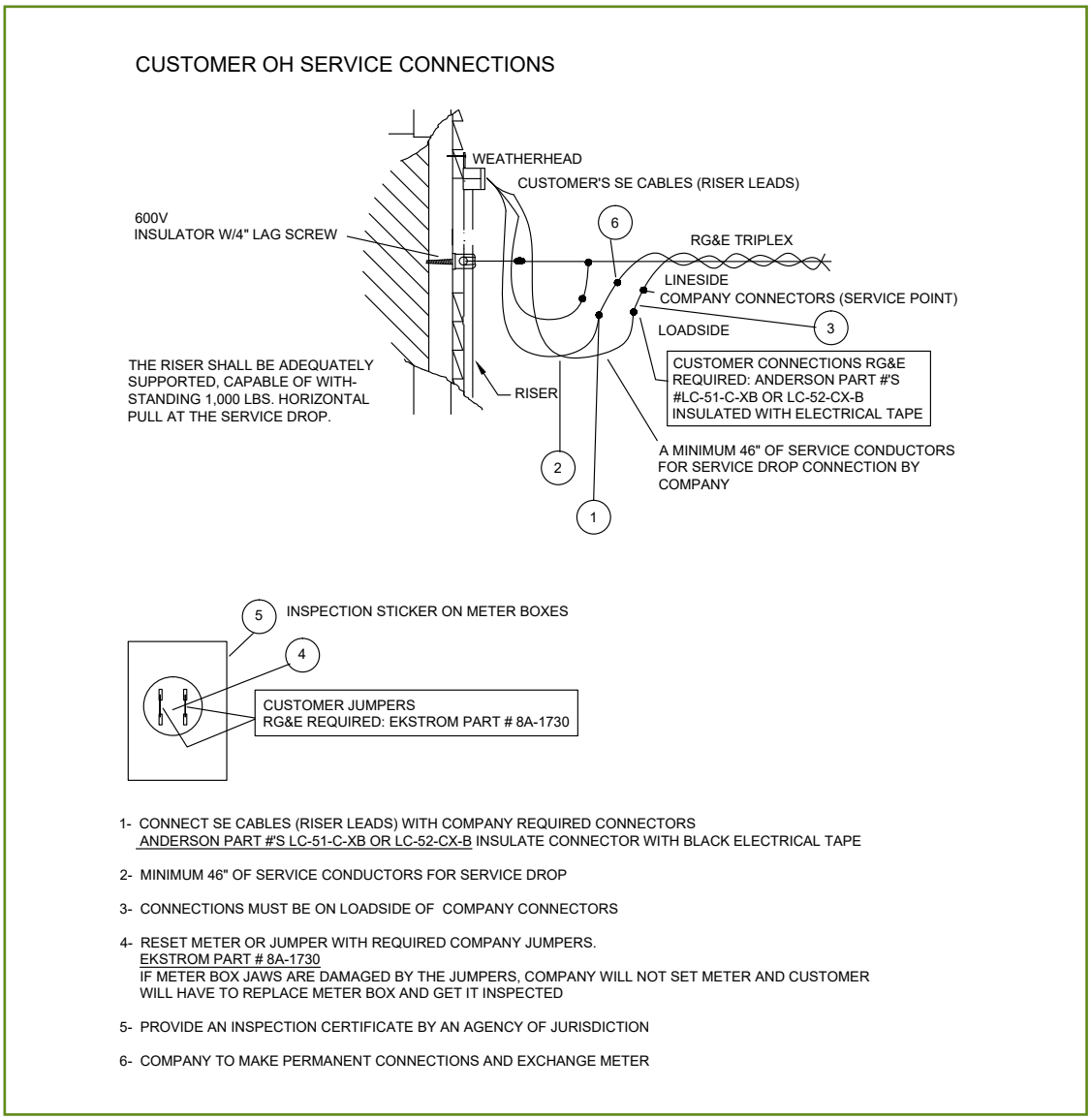


Figure 6

Connections to service equipment must be made without damaging conductors and must be made prior to the company's energizing the customer's equipment. All connections must be made safely and in compliance with the NEC and company requirements.

Unauthorized Attachments

The company forbids all unauthorized attachments to its poles, equipment, or property.

The company will remove all such unauthorized attachments or installations without notice and may seek criminal penalties.

Generating Equipment

Generating equipment connected to circuits which are, or may be, supplied from the company's lines must be installed according to the company's specifications (Refer to Section 14), the NEC, and the specifications of any other regulatory agency. If the unit is fueled by natural gas, consult the company prior to purchasing and installing this type of generator.

3 – 3 Loads

Load Balancing
The customer must connect the load so that a minimum of unbalanced current occurs.

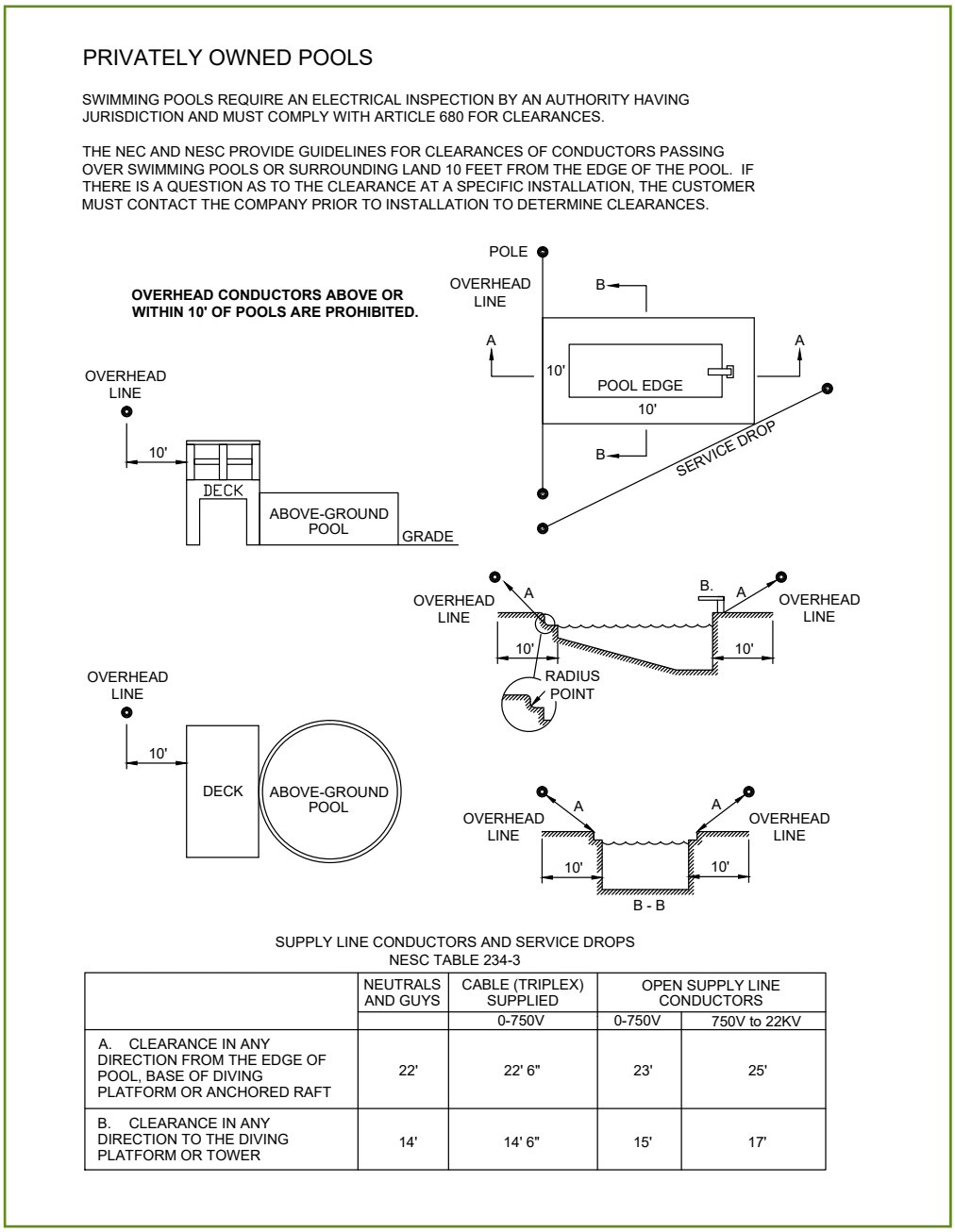
Fluctuating Loads
A fluctuating load interferes with satisfactory service to other customers. Service for such loads requires special consideration.

The company reserves the right to discontinue service unless proper corrective measures are taken when equipment used by the customer results in objectionable effects upon other customers. If the company has to take corrective action, the company charges the customer.

3 – 4 Pools

Swimming Pools
Swimming pools must be properly wired and grounded in accordance with the NEC. Circuits serving pools or associated areas must be protected by Ground Fault Circuit Interrupters (GFCIs).

Improperly Wired Swimming Pools Are Dangerous!



SUPPLY LINE CONDUCTORS AND SERVICE DROPS
NESC TABLE 234-3

	NEUTRALS AND GUYS	CABLE (TRIPLEX) SUPPLIED	OPEN SUPPLY LINE CONDUCTORS	
		0-750V	0-750V	750V to 22KV
A. CLEARANCE IN ANY DIRECTION FROM THE EDGE OF POOL, BASE OF DIVING PLATFORM OR ANCHORED RAFT	22'	22' 6"	23'	25'
B. CLEARANCE IN ANY DIRECTION TO THE DIVING PLATFORM OR TOWER	14'	14' 6"	15'	17'

Figure 7

Privately Owned

The swimming pool (including the diving structures), hot tubs and the area 10 feet horizontally from the inside walls of the pool or hot tub must not be installed under any existing or proposed overhead wiring operating under 600 volts. In addition, the outside wall of the swimming pool or hot tub must remain a minimum of five feet from any underground service connector. The company will not allow service drops over pools or hot tubs or within 10 feet.

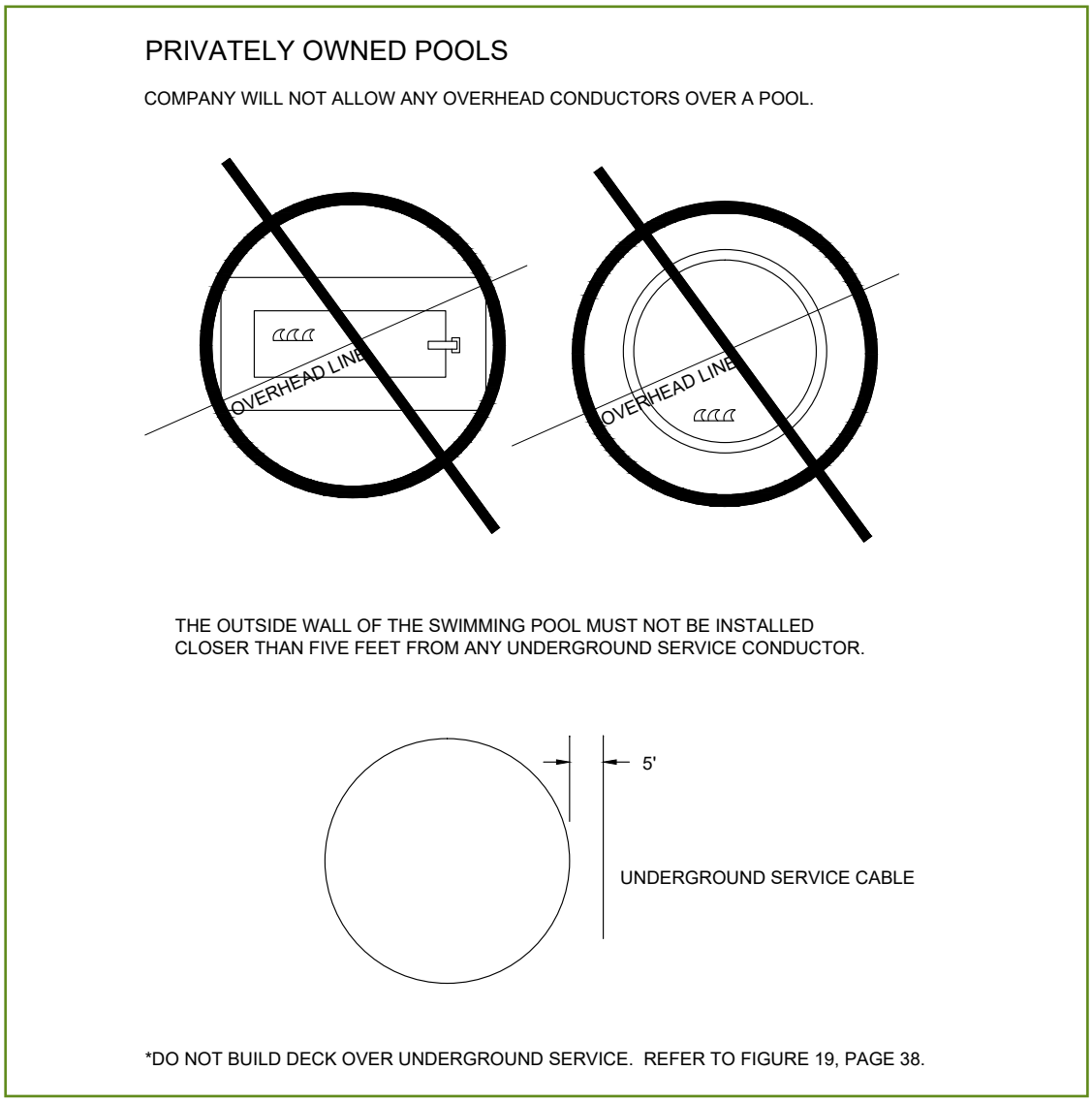


Figure 8

Publicly Owned
The New York State Sanitary Code requires that overhead electrical wires have a minimum clearance of 20 feet measured horizontally from the edge of public swimming pools, or from the mean high-water mark at public bathing beaches. This does not apply to private swimming pools or other bathing facilities owned and maintained by an individual for private use.

Private and Public
The customer is responsible for the relocation of a swimming pool where violations exist. Relocation may be necessary to correct violations created by improper placement and minimum clear ances of the company's overhead electric lines. The customer must contact the company when company electric lines require relocation. In addition, the customer is responsible for costs associated with the relocation of company electric lines.

3 – 5 Vacant Accounts

If a premise (premises) is vacant more than six months, the company requires an electrical inspection by an authority having jurisdiction.

If service was removed by the company for any reason, an inspection is required no matter how long the account has been inactive.

Fire Jobs
If service was shut off by the company at the request of the fire department, an inspection will be required prior to turning the electrical service back on.

Note: A company inspection is required prior to energizing any service and/or meter(s). Access to customer electrical equipment is mandatory. If unsafe conditions exist, the service will remain off and repairs will be necessary at the customer's expense. An inspection by an authority having jurisdiction is also required. A permit must be filed by a qualified electrical contractor to meet the ordinance of the municipality.

Exception: A 12-month seasonal account where the building structure is a vacation or cottage home. Multiple dwelling with multiple metering and 1 active meter (account).

SECTION 4 Service Requirements and Responsibilities

4 – 1 New and Existing Service Installations

General

4 – 1a Customer/Contractor

- Fulfill the Customer/Contractor Requirements in the How to Obtain Service section at the beginning of this booklet.
- Submit a completed Service Request form before beginning any electrical work. Only one service of the same voltage is available to a customer's premises. Any deviations are at the company's discretion, subject to the NEC and the total service limitations defined in New Service Less Than 600 Volts.
- Ensure that the minimum service entrance and service equipment be rated at **100 amperes** for residential and commercial (exceptions are at the discretion of the company).
- Size services according to the NEC to meet both customer load and voltage drop requirements.
- Provide, install, own, and maintain all service entrance conductors, service laterals, and service equipment. Customer must install **copper** type cable if service is run from handhole or manhole.
- Provide, own, and maintain meter sockets, enclosures, and multiple metering installations.
- Provide a certificate of electrical inspection from an authority having jurisdiction. This must occur before the company will connect the new service installation, rewire, or upgrade to the company's distribution system.
- Reimburse the company for its expense in locating a fault on any service lateral repair.

4 – 1b Company

- Recommend that the capacity of service equipment be greater than the required minimum to provide for future growth.
- Determine the type of construction, route of the service connection, and location of metering equipment.
- Permit an exception for traffic signals or similar low consumption usage equipment.
- Provide current and voltage transformers for services greater than 400 amperes.
- Install, own, and maintain adequate metering to measure the energy and demand use in accordance with its rates.
- Connect and energize the service after receipt of the electrical inspection certificate.
- Refuse to connect and energize the service lateral tap if not installed in accordance with the company's underground specifications and the NEC.

4 – 2 Pullbox

Customer rewires or upgrades the premise service that has RG&E cables terminated in a pullbox, the pullbox will be removed and the meterbox must be moved outside. The customer must consult with the company to determine the type of service to be provided before proceeding with the installation of wiring or ordering electrical equipment.

Accessible by Ladder
Capable of being reached from the ground at level grade with a 24-foot extension ladder.

Customer Premise Wiring shall be accessible by *Ladder Reference Drawing*. (Refer to Figure 9 on page 26)

1. Capable of being reached from the ground at level grade with a 24-foot extension ladder (without climbing off ladder.) Ladders shall be used only on stable and level surfaces unless secure.

   1A. **Acceptable** for final grade:
   1. Grass/dirt
   2. Blacktop driveway
   3. Sidewalk

   1B. **Unacceptable**
   1. Stamped concrete patio
   2. Decks
   3. Sloped yard

2. Ensure that the point of attachment is not less than 12 feet or more than 25 feet above final grade. The point of attachment must be of sufficient height to provide minimum clearances. These clearances are required by the *NEC, Article 230*, and vary dependent on the type of service and types of terrain the service drop crosses.

3. Any exception made for posting a service will be via conversation with RG&E and the inspector or meeting with RG&E and the inspector on-site.

4. Electrical inspection by the authority having jurisdiction – Final Inspection Service Determination Inspector by field verification and approval; references *NYSCE, NFPA Electrical Inspection Manual, NEC Article 90.7 Examination of Equipment for Safety, Article 110.2 Approval, Article 110.3 Examination, Identification, Installation, and Use of Equipment.*

Any exceptions for RG&E or electrician posting a service will be by conversation with RG&E and the Electrical Inspector. The exception will be documented in RG&E's Service Notification and the Electrical Inspector will document on the Final Inspection Certificate (cut in card) with specific exception information and RG&E contact references.

References

RG&E	*Accident Prevention Manual July 1, 2017-Fall Protection 1.12 (E) Ladders*
RG&E	*Ladder Selection and Safety*
RG&E	*Requirements for Installation of Electric Services and Meter Booklet September 2004*
NEC	*Adopted National Electrical Code by NYS*
NFPA-70	*National Electrical Code*
NFPA-70E	*Standard for Electrical Safety in the Workplace*
NYSCE	*New York State Code Enforcement*

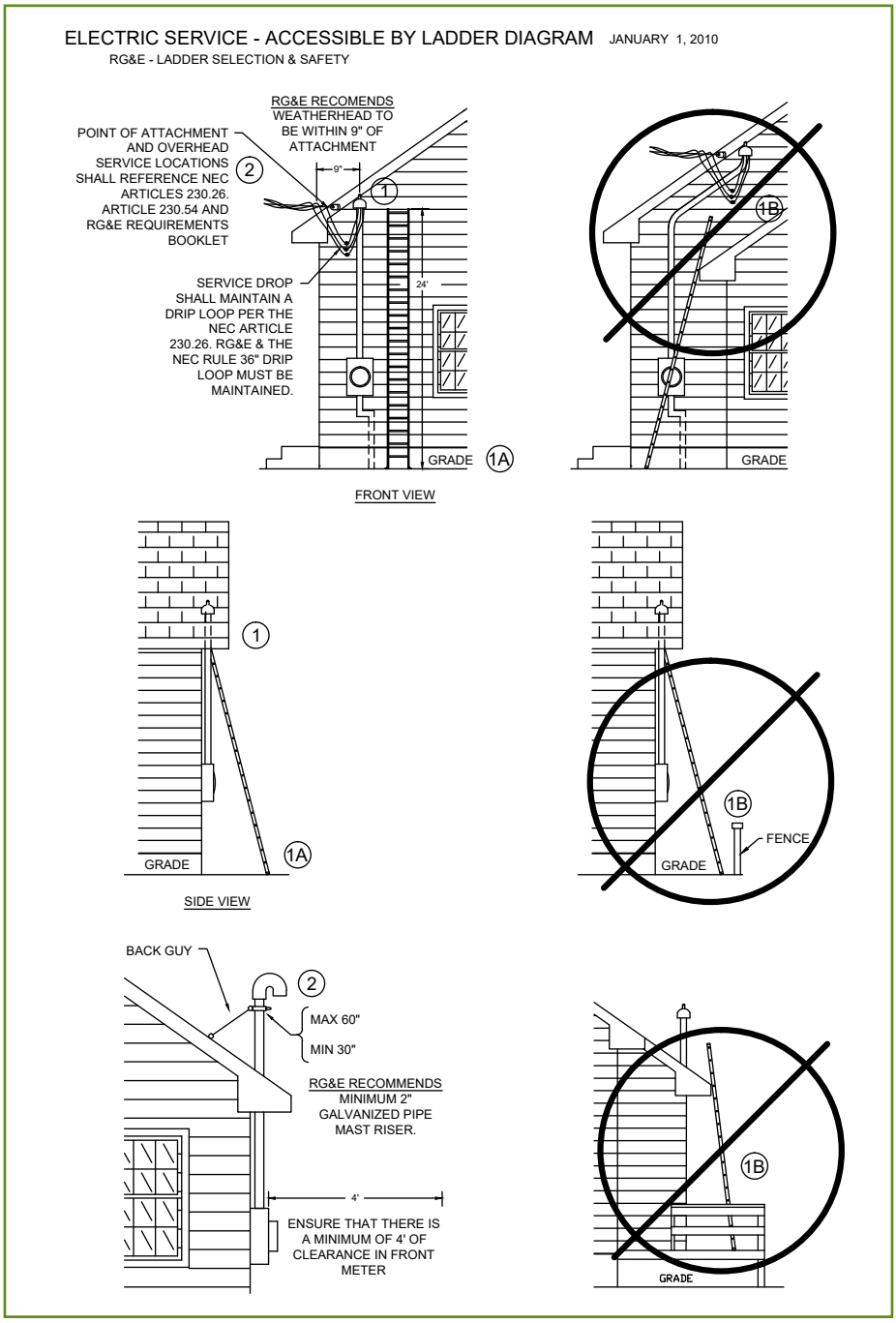
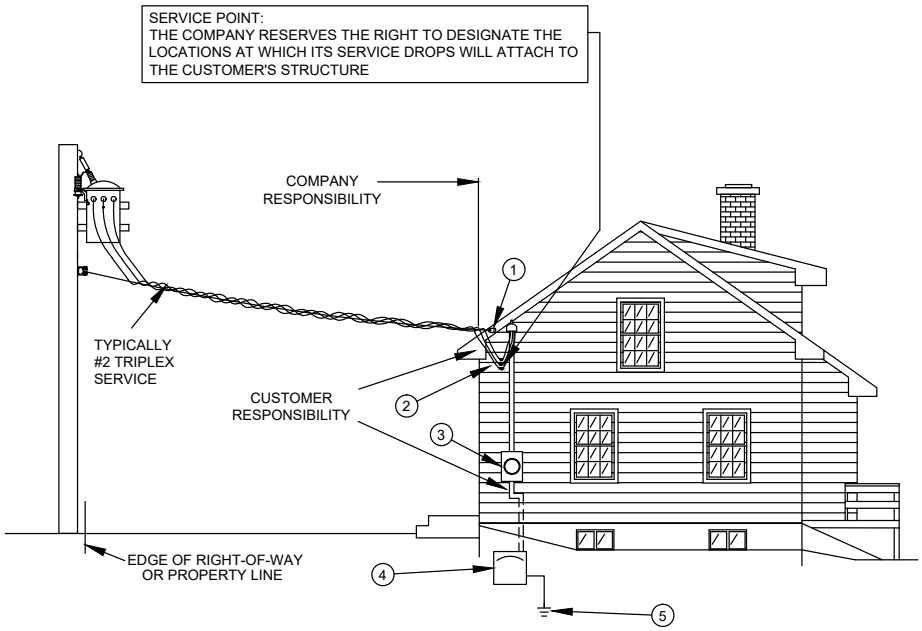


Figure 9

4 – 3 Residential Overhead Service

RESIDENTIAL OVERHEAD SERVICE

THE COMPANY INSTALLS, OWNS, AND MAINTAINS THE OVERHEAD SERVICE DROP.



CHECK LIST-BEFORE OBTAINING AN ELECTRICAL INSPECTION APPROVAL AND SCHEDULING WITH COMPANY

1. 600V INSULATOR INSTALLED AT PROPER HEIGHT TO MAINTAIN CLEARANCE. MUST BE ACCESSIBLE BY LADDER FROM GROUND.

2. DRIP LOOP- 36" MINIMUM LOOP FORMED ON INDIVIDUAL CONDUCTORS, TO PREVENT THE ENTRANCE OF MOISTURE.
   A. OPEN CONDUCTORS- 3' MINIMUM FROM WINDOW.

3. METER BOX- MOUNT 3' TO 6' FROM CENTER OF METER TO GRADE MAINTAIN 4' OF WORKING CLEARANCE IN FRONT OF METER BOX.
   A. UL-LISTED CERTIFICATION.
   B. CONDUCTORS TERMINATED IN METER BOX ACCORDING TO COMPANY REQUIREMENT AND THE NEC.
   *C. INSPECTION AGENCY STICKER ON RIGHT SIDE OF BOX, SIGNED BY INSPECTOR.

4. PANEL INSTALLED WITH MAIN
   A. CONDUCTORS TERMINATED IN MAIN DISCONNECT PANEL ACCORDING TO THE NEC.

5. MAIN DISCONNECT GROUNDED ACCORDING TO THE NEC.

* ELECTRICAL INSPECTION STICKER OF CERTIFICATION REQUIRED ON METER BOX:

1. NEW SERVICE INSTALLATION 2. CUSTOMER REWIRES AND/OR SERVICE UPGRADES
   A. DISCONNECTS AND RECONNECTS SERVICE RISER LEADS FOR CUSTOMER TO INSTALL SERVICE AND RECONNECTED BY THE COMPANY.
   B. SCHEDULES ELECTRICAL INSPECTOR ON SITE AFTER COMPANY DISCONNECTS SERVICE FOR CUSTOMER TO INSTALL SERVICE AND RECONNECTED BY THE COMPANY.

Figure 10

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 3a Customer/Contractor

- Contact the company for the point of attachment for new services or if the service point attachment changes. Connections must be accessible by ladder from the ground at level grade.
- Determine the location of the service drop.
- Ensure that the point of attachment is **not less than 12 feet or more than 25 feet above final grade**. The point of attachment must be of sufficient height to provide minimum clearances. These clearances are required by the *NEC, Article 230*, and vary dependent on the type of service and types of terrain the service drop crosses.
- Provide and install service drop attachments for single-phase services (600-volt insulator applications). Generally, an overhead service drop is limited to supply service equipment rated 800 amperes or less. The company recommends an underground service for a service larger than 800 amperes.

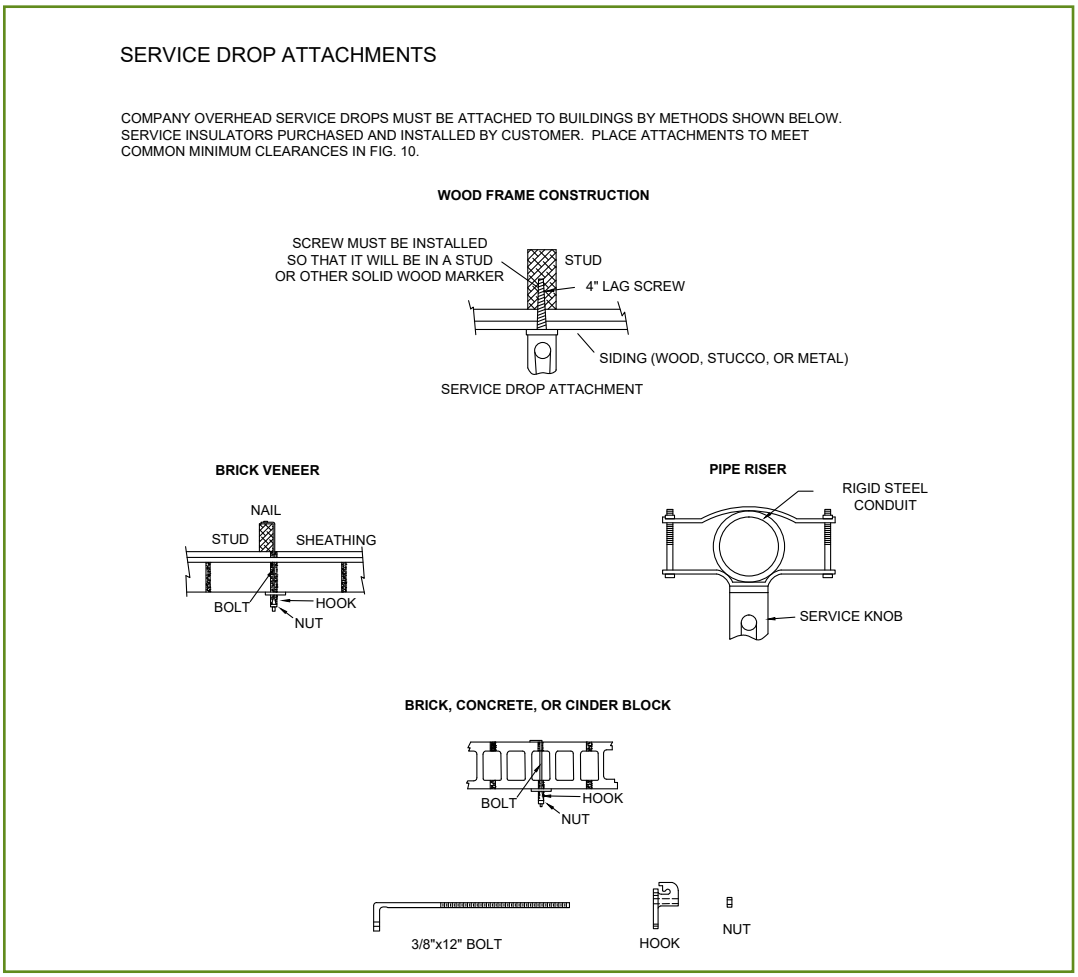


Figure 11

4 – 3b Customer/Contractor

- Ensure that there is a minimum of four feet of clearance in front of the meter.

4 – 3c Company

- Designate the location of the service, if there is an obstruction or clearance issue.

4 – 4 Service Head and Riser (Weatherhead)

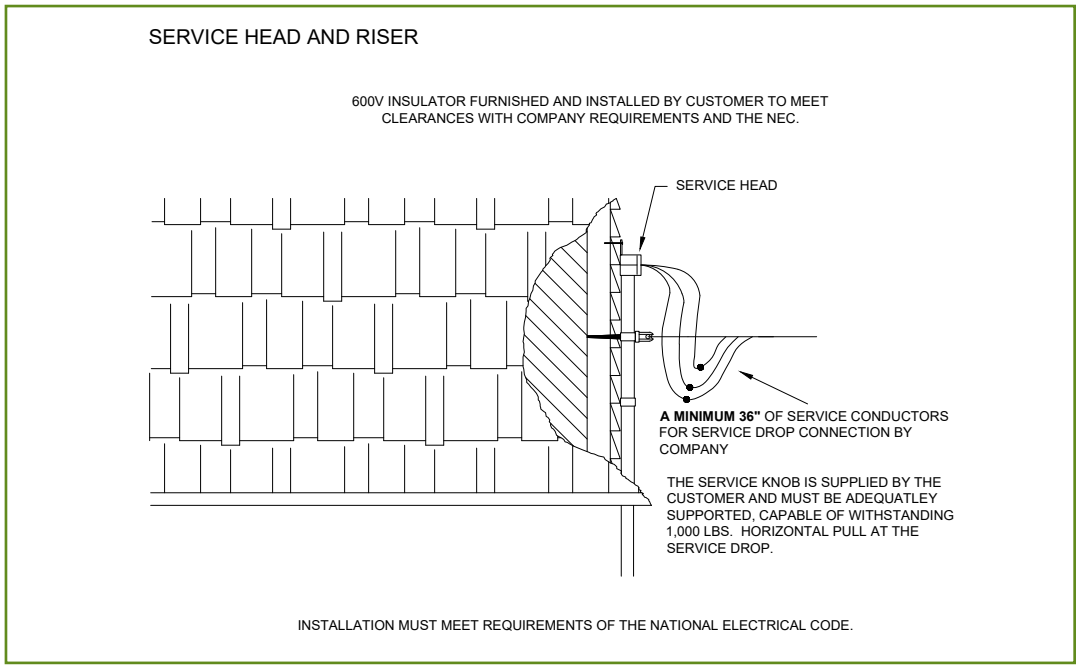


Figure 12

4 – 5 Pipe Mast Riser

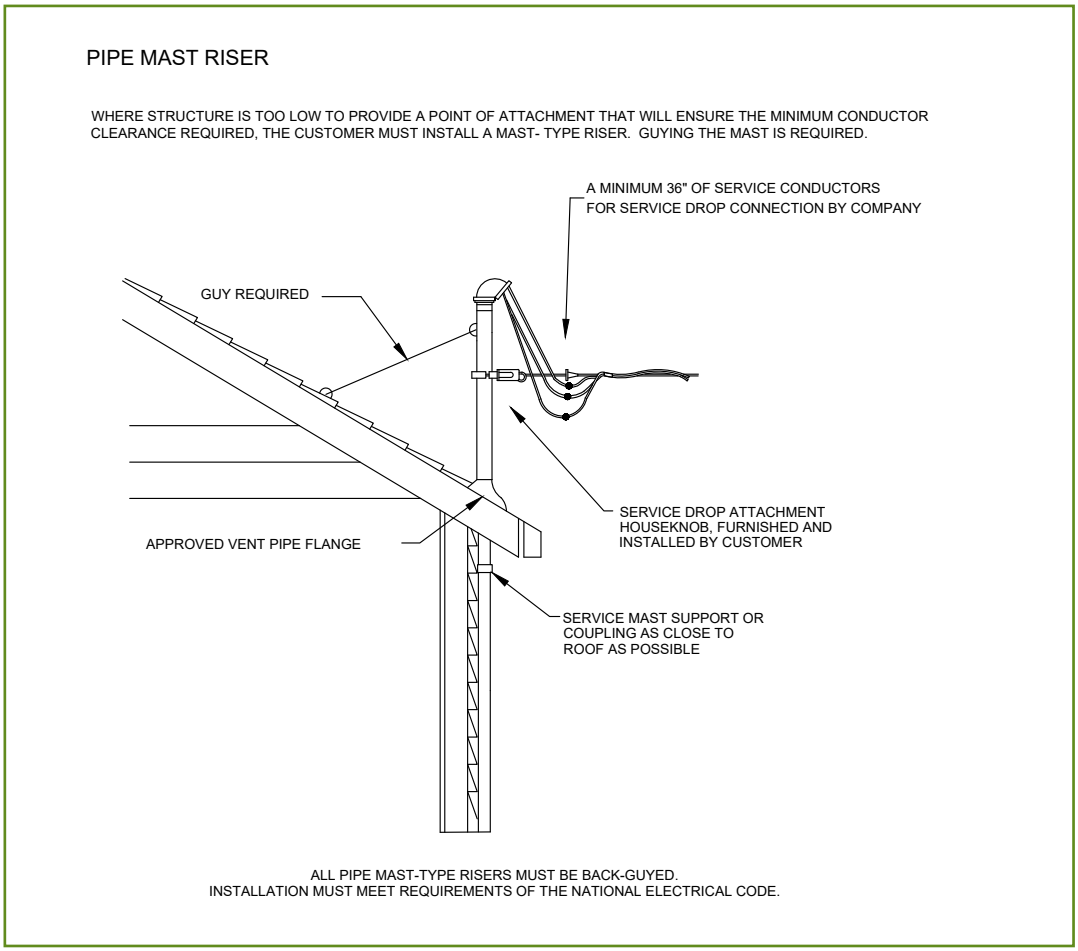


Figure 13

4 – 6 Common Minimum Clearances

MINIMUM CLEARANCES

MINIMUM CLEARANCES		
1.	3'	FROM WINDOWS, DOORS, PORCHES, FIRE ESCAPES, ETC.
2.	3'	ROOF WITH 4" IN 12" SLOPE OR GREATER (LIMITED 300V)
3.	10'	ABOVE ACCESSIBLE ROOFS, DECKS, OR PROJECTIONS, PLATFORMS OR PROJECTIONS FROM WHICH THEY MIGHT BE REACHED
4.	12'	ABOVE FINAL GRADE, SIDEWALKS, AND RESIDENTIAL DRIVEWAYS, 25 FEET MAXIMUM HEIGHT OF ATTACHMENT TO LOWEST WIRE ABOVE FINAL GRADE
5.	15'	ABOVE AUTOMOBILE PARKING LOT, DRIVE-IN ESTABLISHMENTS, AND SIMILAR COMMERCIAL AREAS NOT SUBJECT TO TRAFFIC OR DUMPSTER PICKUP
6.	18'	ABOVE PUBLIC STREETS, ALLEYS, ROADS, AND DRIVEWAYS OTHER THAN RESIDENTIAL PROPERTY, LAND, ORCHARD, GRAZING, OR FOREST

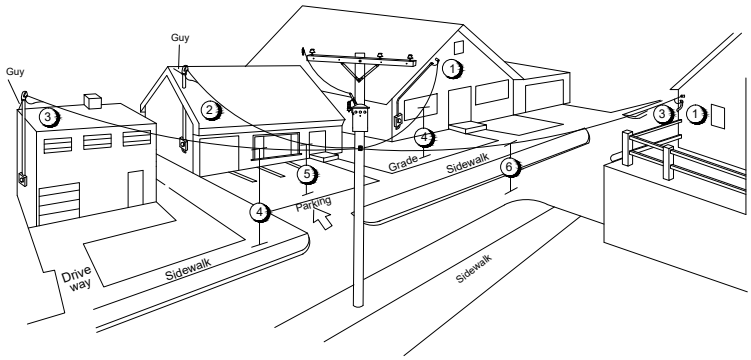


Figure 14

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 7 Temporary Service

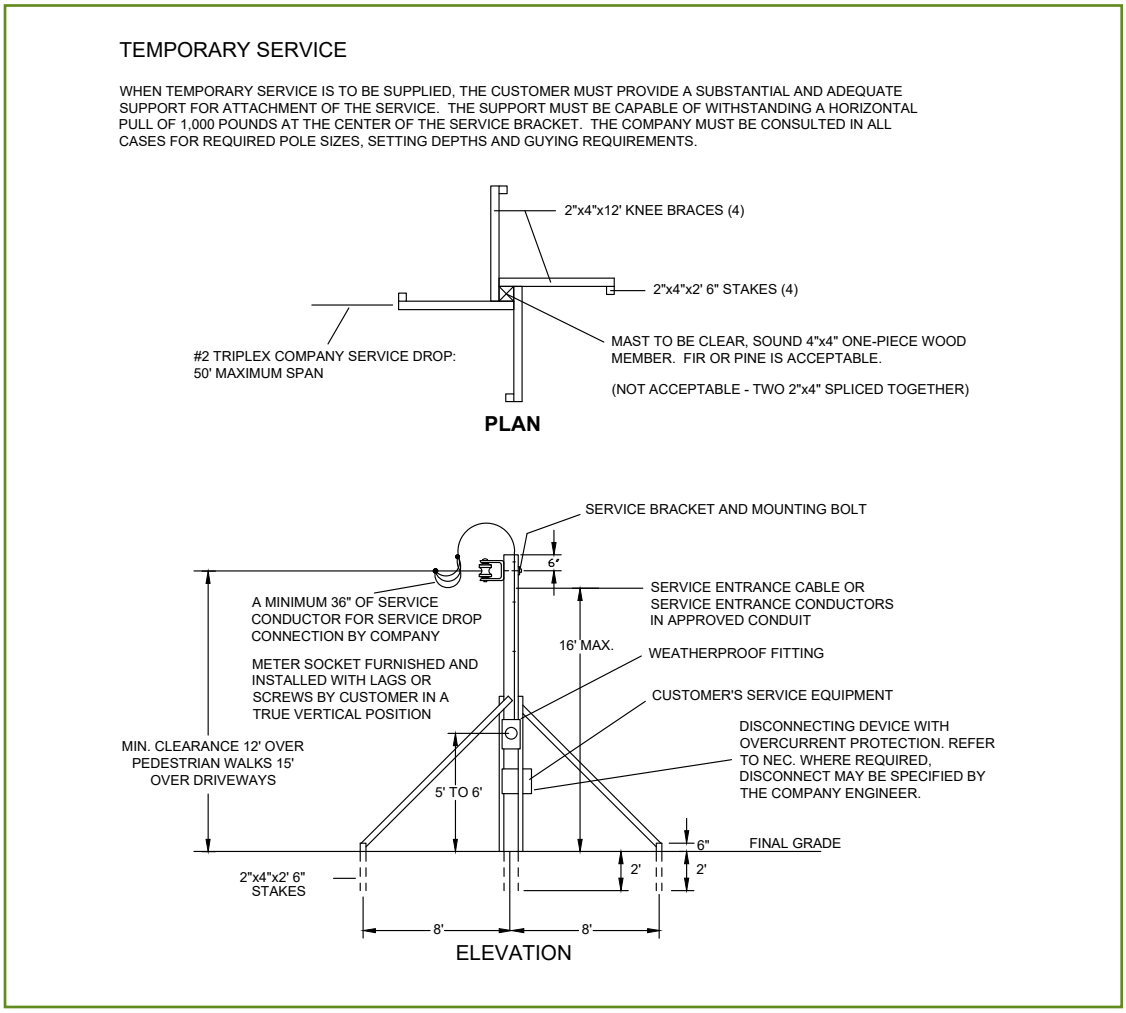


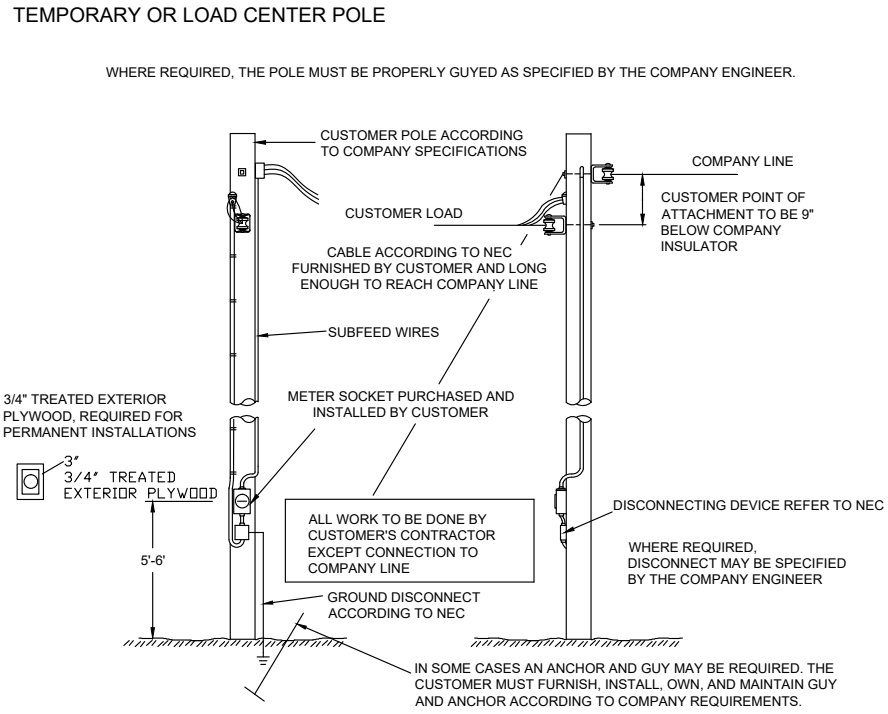
Figure 15

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 7a Customer/Contractor

- Pay the cost of installation and removal of temporary service in accordance with the *Tariff Schedules for Electric Service.*

4 – 8 Load Center Pole (Distribution Point, Refer to NEC 547.2)



ON CONSTRUCTION, FARMS OR OTHER PREMISES WHERE TWO OR MORE BUILDINGS UNDER A SINGLE OCCUPANCY OR MANAGEMENT ARE SUPPLIED THROUGH ONE METER, IT MAY BE APPROPRIATE TO INSTALL A TEMPORARY OR LOAD CENTER POLE (METER ON POLE). IN SUCH CASES, THE METER POLE WITH NECESSARY GUYS MUST BE FURNISHED, INSTALLED, OWNED, AND MAINTAINED BY CUSTOMER.

POLE TYPES

PERMANENT INSTALLATION
POLE MUST BE UTILITY GRADE AND **BRAND NEW**
MINIMUM 25' HIGH, 5' IN GROUND
SUPPORT METER BOX WITH 3/4" TREATED EXTERIOR PLYWOOD
SECURELY FASTENED TO THE METER BOX AND POLE
WITH MINIMUM 3" AROUND THE PERIMETER OF THE METER BOX

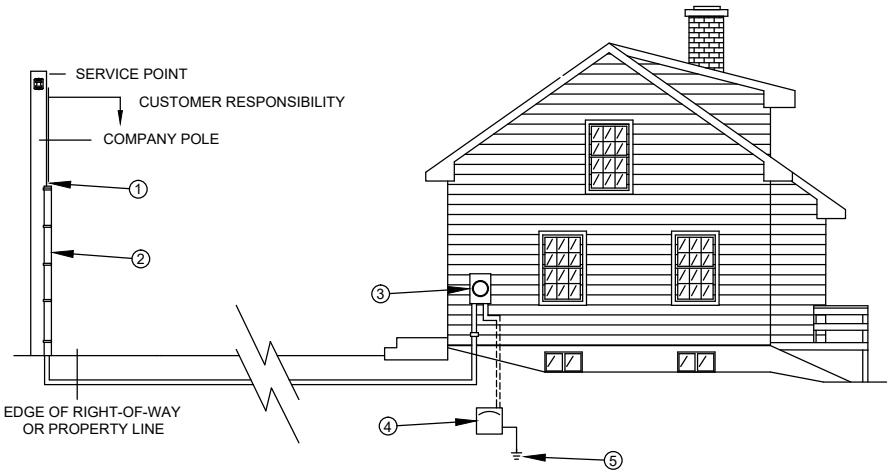
TEMPORARY INSTALLATION POLE MUST BE UTILITY GRADE
MINIMUM 25' HIGH, 5' IN GROUND ATTACH METER BOX TO POLE OR TO
3/4" TREATED EXTERIOR PLYWOOD AS DESCRIBED ABOVE

Figure 16

4 – 9 Residential Underground Service Connection from Overhead Lines Less Than 600 Volts

RESIDENTIAL UNDERGROUND SERVICE

THE CUSTOMER MUST FURNISH, INSTALL, OWN, AND MAINTAIN THE NECESSARY FACILITIES AT THE CUSTOMER'S EXPENSE. THE SERVICE CABLES AND THE INSTALLATION MUST BE IN ACCORDANCE WITH COMPANY REQUIREMENTS AND THE NEC AND IS MAINTAINED BY THE CUSTOMER.



CHECK LIST-BEFORE OBTAINING AN ELECTRICAL INSPECTION APPROVAL AND SCHEDULING WITH COMPANY

1. CABLE LENGTH MUST BE SUFFICIENT TO REACH COMPANY SECONDARY PLUS 48". COIL AND SECURE CABLE TO POLE.
2. STAND PIPE AND BEND MUST MEET COMPANY AND NEC REQUIREMENTS FOR PROTECTION AGAINST DAMAGE.
3. METER BOX- MOUNT 3' TO 6' FROM CENTER OF METER TO GRADE. MAINTAIN 4' OF WORKING CLEARANCE IN FRONT OF METER BOX .
   - A. UL- LISTED CERTIFICATION
   - B. CONDUCTORS TERMINATED IN METER BOX ACCORDING TO COMPANY REQUIREMENTS AND THE NEC
   - *C. INSPECTION AGENCY STICKER ON RIGHT SIDE OF BOX, SIGNED BY INSPECTOR
4. PANEL INSTALLED WITH MAIN
   - A. CONDUCTORS TERMINATED IN MAIN DISCONNECT PANEL ACCORDING TO THE NEC.
5. MAIN DISCONNECT GROUNDED ACCORDING TO THE NEC.

* ELECTRICAL INSPECTION STICKER OF CERTIFICATION REQUIRED ON METER BOX:

1. NEW SERVICE INSTALLATION
2. CUSTOMER REWIRES AND/OR SERVICE UPGRADE
   - A. REWIRES FROM OVERHEAD TO UNDERGROUND
   - B. SCHEDULES ELECTRICAL INSPECTOR ON SITE AFTER COMPANY DISCONNECTS SERVICE FOR CUSTOMER TO INSTALL SERVICE AND RECONNECTED BY THE COMPANY

Figure 17

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 9a Customer/Contractor

- Consult the company if requesting an underground service lateral from the company's overhead line.

- Install and maintain the service cable.

  Note: For residential services, the company recommends the use of a single three-phase conductor (2-4/0 & 1-2/0) aluminum direct burial 200 amp. 600-volt cable for up to 250 feet.

- Choose between these two options if the underground service is longer than 250 feet:
  1. Install a metering pedestal as detailed in Section 8.
  2. Request the installation of primary cables and padmount transformer on the customer's premise (premises).

- Fulfill these requirements if Option 2 is selected:
  1. Follow the *Common Utility Trench Requirements*, Section 4–20.
  2. Provide a trench according to company specifications from the company's distribution system to the transformer location.
  3. Provide an excavation on the customer's property for the transformer pad according to company specifications.
  4. Coordinate the installation of gas and/or communication facilities, if these will be installed in the same trench. (Refer to Section 4–20)
  5. Consult the company before work begins so that the company can locate the service point at the pole, the conduit location from which service will be taken, the route to be followed, and the meter location.

  Note: The cable must be carefully coiled, capped, and fastened to the pole above the conduit.

  6. Install standpipe and bend. (Refer to Figure 18 on page 36)
  7. No more than two (2) electrical conduits on any company pole.
  8. If #2 ground wire is already installed on the pole, it can be used for grounding customer standpipe.

4 – 9b Company

- Install a pole and appropriate guy on the customer premises to be served, if the company's distribution is on the opposite side of the highway. Charges may be applied according to the *Tariff Schedules for Electric Service*.

- Allow only two electrical conduits on any company pole.

- Provide and install, without charge, the protective covering above the standpipe, the necessary cable supports and fittings.

- Connect the cable to its secondary system.
- Install primary cables and transformer pad in the customer-provided trench and excavation, if the customer chooses to have a padmount transformer placed on the customer's premise (premises) (service lateral longer than 250 feet). Install padmount transformer foundation and padmount transformer.
- Require that all buried conductors pass a 1,000 volt direct current (VDC) megger test performed by the company, after the trench is backfilled and prior to energization. The minimum acceptable megger resistance value for new cables is 2,000 megaohms.

4 – 10 Standpipe and Bend on Pole

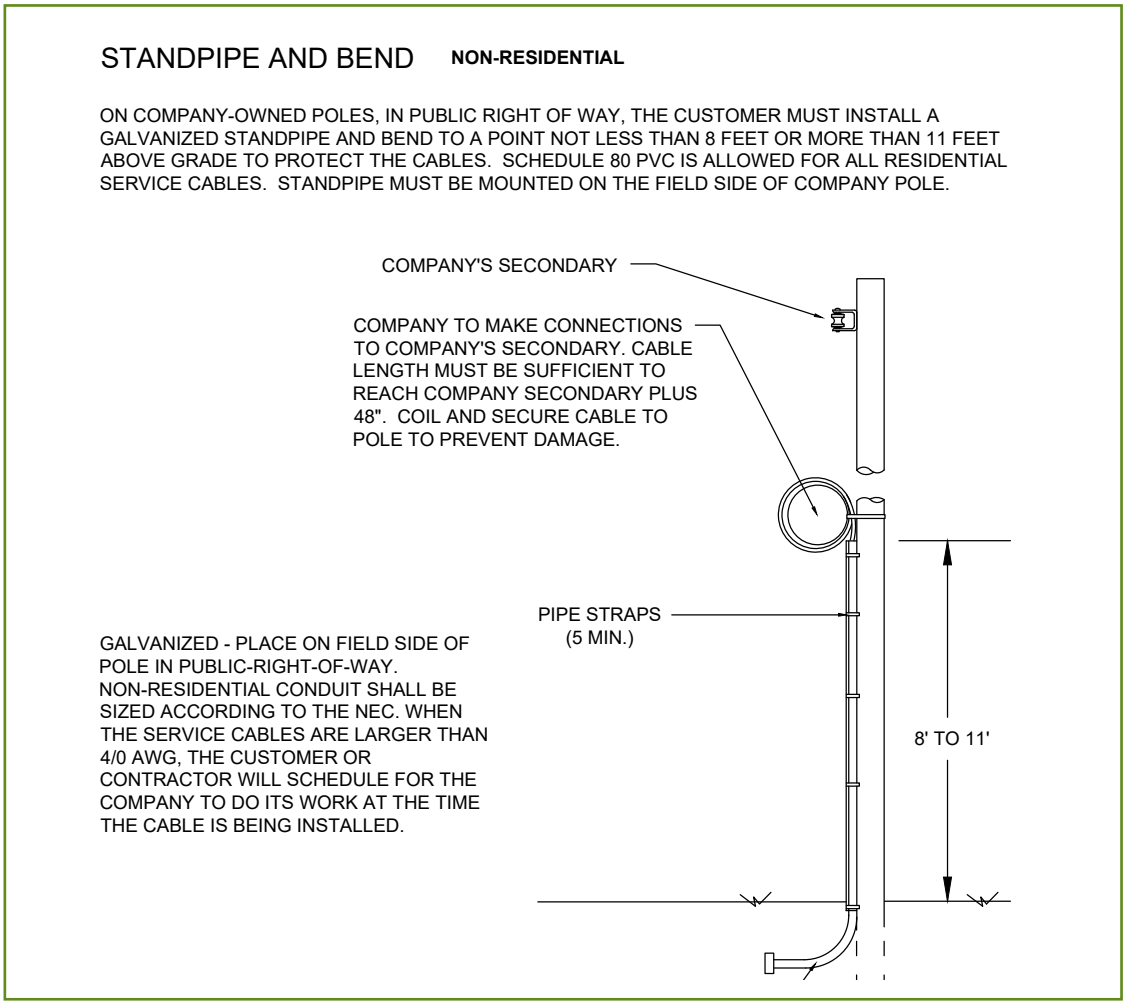


Figure 18

4 – 11 Meter Pedestals (Refer to Section 8)

4 – 12 Residential Underground Service Lateral

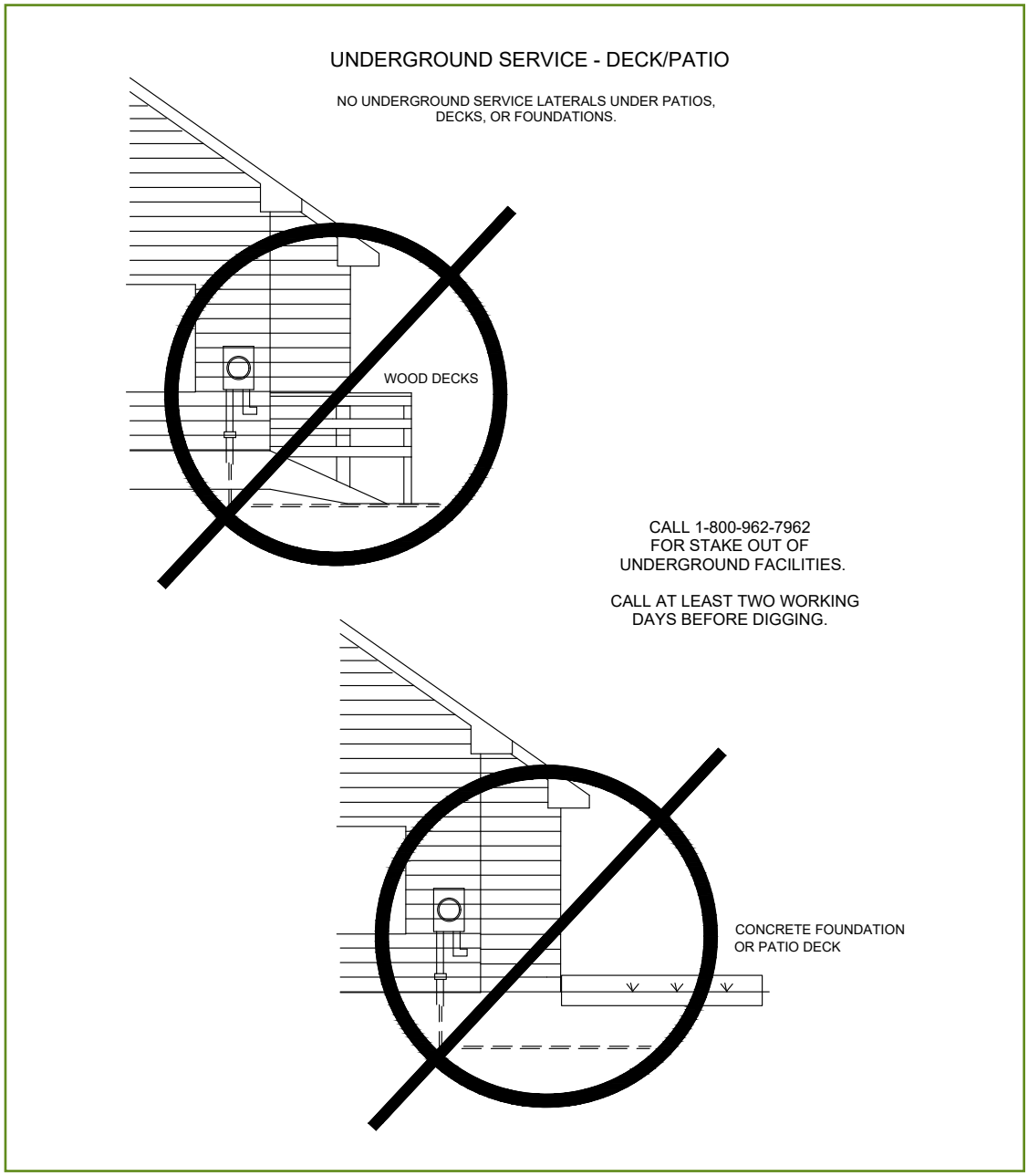


Figure 19

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 12a Customer/Contractor

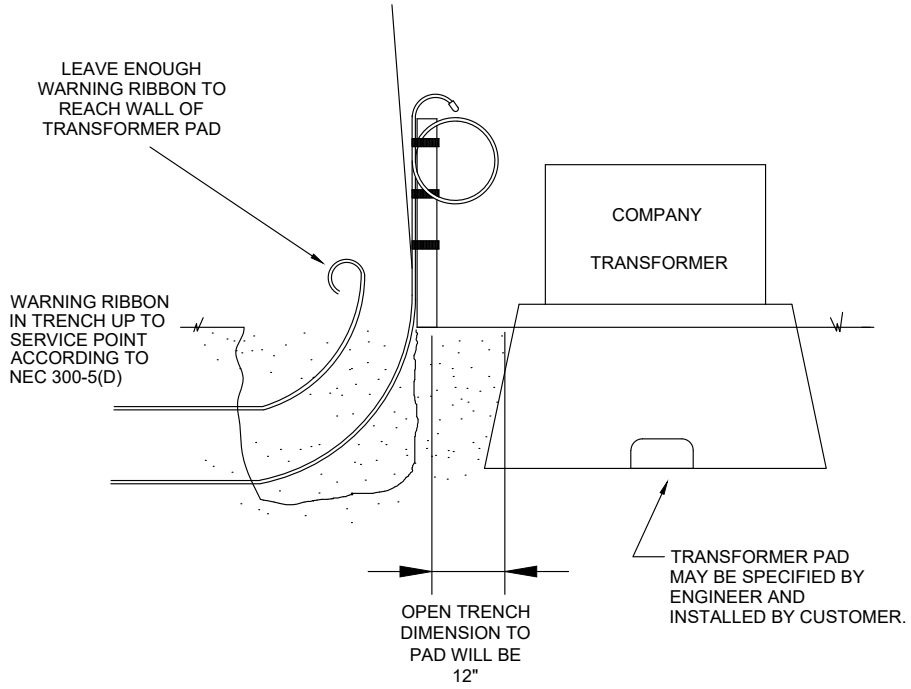
- Install and maintain underground service cable in accordance with the NEC and company requirements.

4 – 13 Transformer Pad

TRANSFORMER PAD

CUSTOMER MUST:

- LEAVE 9 FEET OF CABLE COILED AND SECURED ABOVE GRADE.
- LEAVE 4 FEET OF TRENCH OPEN WITH CABLE 12 INCHES AWAY FROM TRANSFORMER PAD WALL, WITH ACCEPTABLE SOIL PROVIDED FOR COMPANY CREW TO BACKFILL TRENCH AND CABLE.



CONTRACTOR MUST REFER TO THE COMPANY ENGINEERING SKETCH FOR SERVICE POINT LOCATION. THE BUILDER/DEVELOPER HAS THE SKETCH ON FILE AND THE SERVICE REQUEST WILL BE RETURNED WITH THIS INFORMATION. IF THE CONTRACTOR RUNS THE SERVICE TO THE WRONG SERVICE POINT LOCATION, THE SERVICE WILL NOT BE ENERGIZED AND IT WILL HAVE TO BE RELOCATED AT THE CONTRACTOR'S EXPENSE TO THE RIGHT LOCATION. COMPANY MAY CHARGE FOR A SECOND TRIP.

Figure 20

4 – 14 Service Point (Property Line)

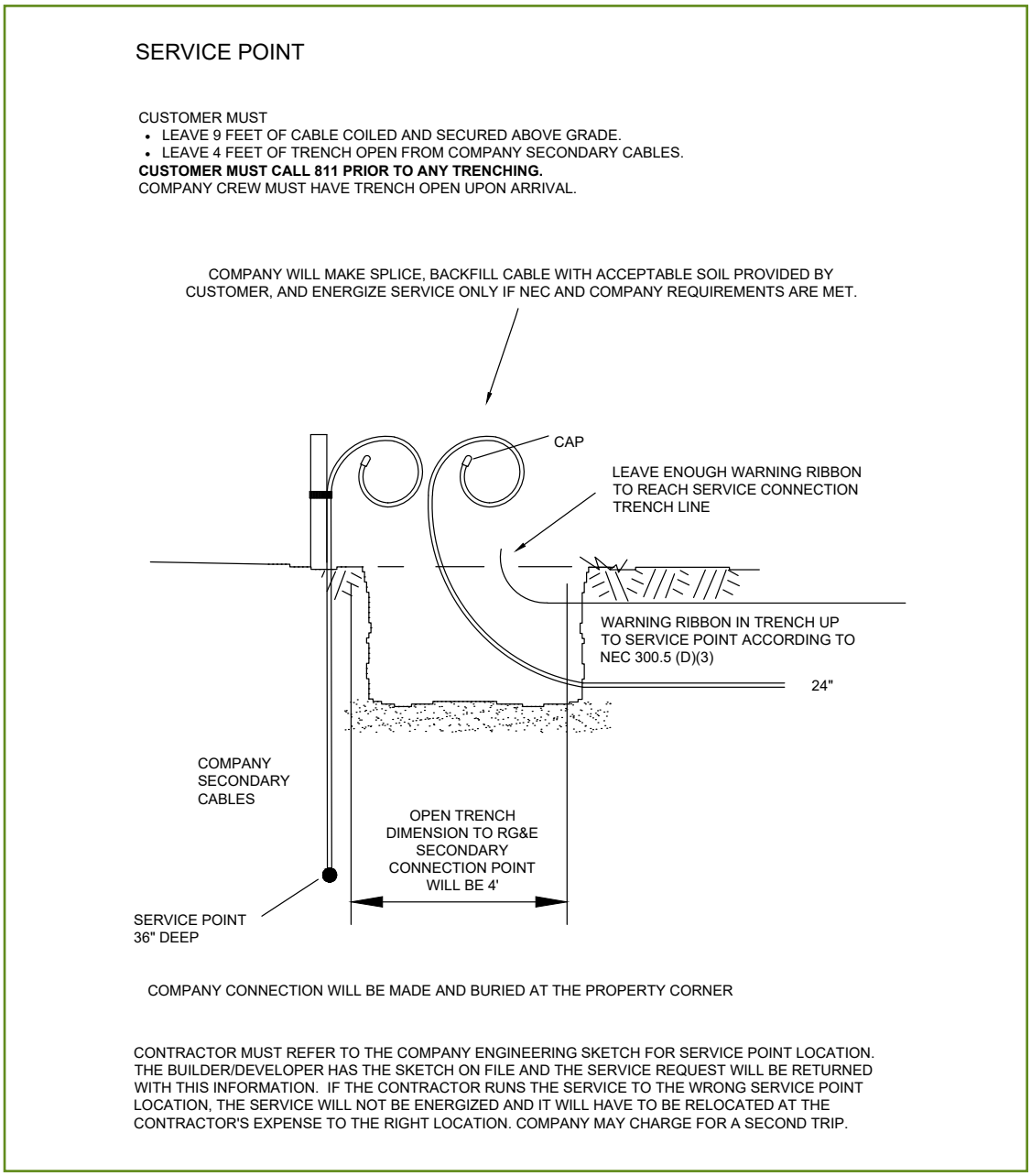
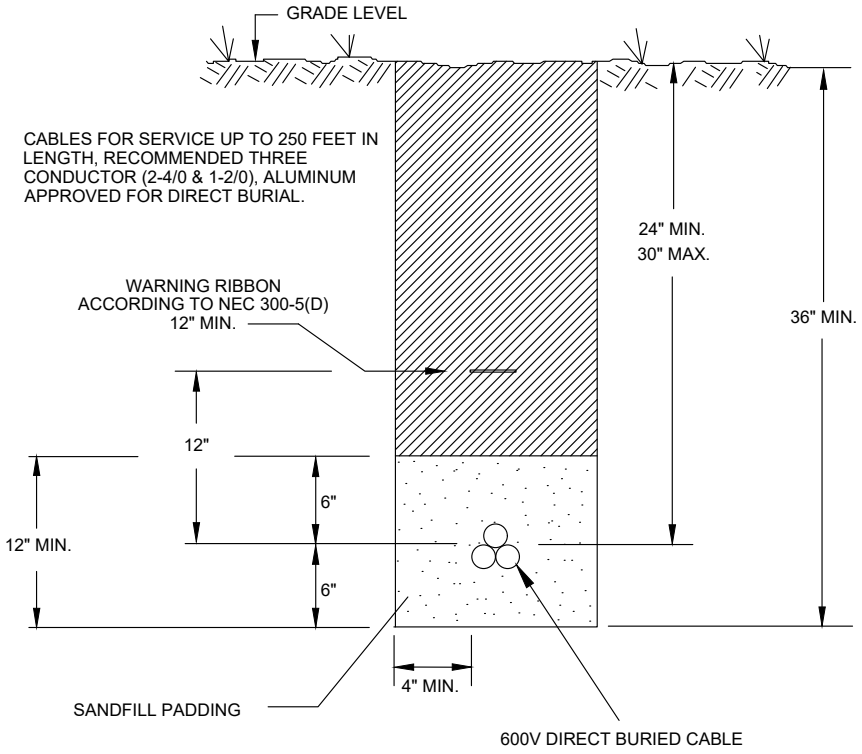


Figure 21

4 – 15 Direct Buried Service Lateral

DIRECT BURIED SERVICE LATERAL

UNDERGROUND SERVICE CABLES MUST BE INSTALLED AND MAINTAINED BY THE CUSTOMER. CABLES MUST BE BURIED A MINIMUM OF 24 INCHES BELOW FINAL GRADE LAID IN THE CENTER OF A 12-INCH VERTICAL LAYER OF ACCEPTABLE SAND PADDING, WITH WARNING RIBBON ACCORDING TO NEC REQUIREMENTS. BACKFILL MUST BE CLEAN EARTH WITH NO DEBRIS OR ROCKS OVER 2 INCHES IN DIAMETER FOR THE FIRST 12 INCHES OF COVER OVER THE SAND PADDING. NO ROCKS LARGER THAN 6 INCHES IN DIAMETER ARE ALLOWED IN THE REMAINING BACKFILL.



IF CUSTOMER REQUESTS TO RUN SERVICE GREATER THAN 250 FEET, AN APPROVED METER PEDESTAL MUST BE INSTALLED. THE PEDESTAL LOCATION WILL BE DESIGNATED BY THE COMPANY.

Figure 22

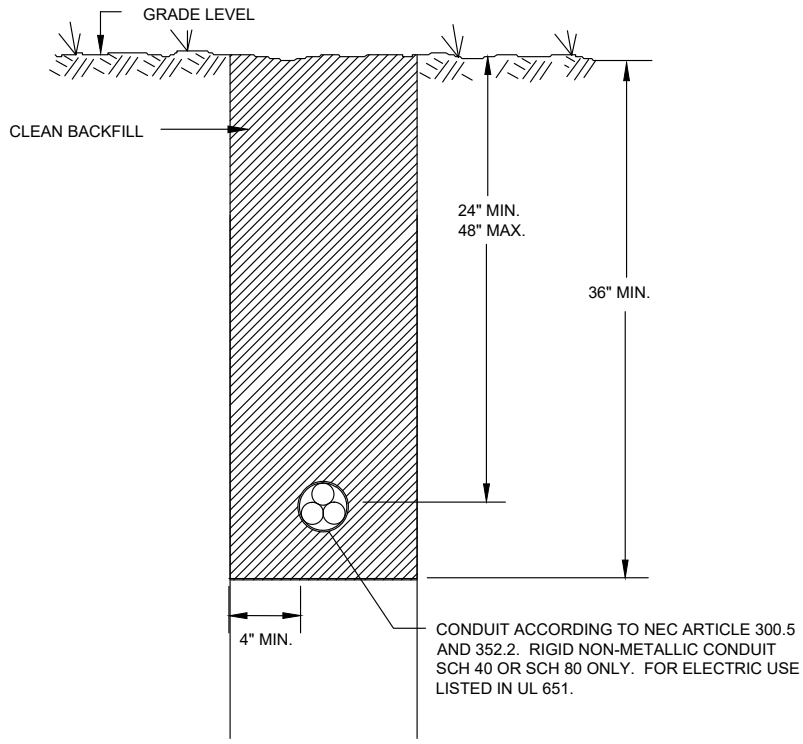
4 – 16 Service Lateral Installed in Conduit

SERVICE LATERAL INSTALLED IN CONDUIT

IF UNDERGROUND SERVICE CABLES ARE TO BE INSTALLED IN CONDUIT, THE CONDUIT SYSTEM MUST BE SCHEDULE 40 PVC DB, LISTED RIGID NON-METALLIC CONDUIT IN ACCORDANCE WITH ARTICLE 300 OF THE NEC AND MAINTAINED BY THE CUSTOMER.

CABLES FOR SERVICE UP TO 250 FEET IN LENGTH, RECOMMENDED THREE CONDUCTOR (2-4/0 & 1-2/0) ALUMINUM.

IF CUSTOMER REQUESTS TO RUN SERVICE GREATER THAN 250 FEET, AN APPROVED METER PEDESTAL MUST BE INSTALLED. THE PEDESTAL LOCATION WILL BE DESIGNATED BY THE COMPANY.



CONDUIT MUST BE USED UNDER ROADS OR DRIVEWAYS.

Figure 23

Note: If customer chooses to install more than 250 horizontal feet with 600-volt service cables, a metering pedestal must be installed. The company will designate the location for this type of installation. (Refer to Section 8)

4 – 17 Service Lateral Under Driveway

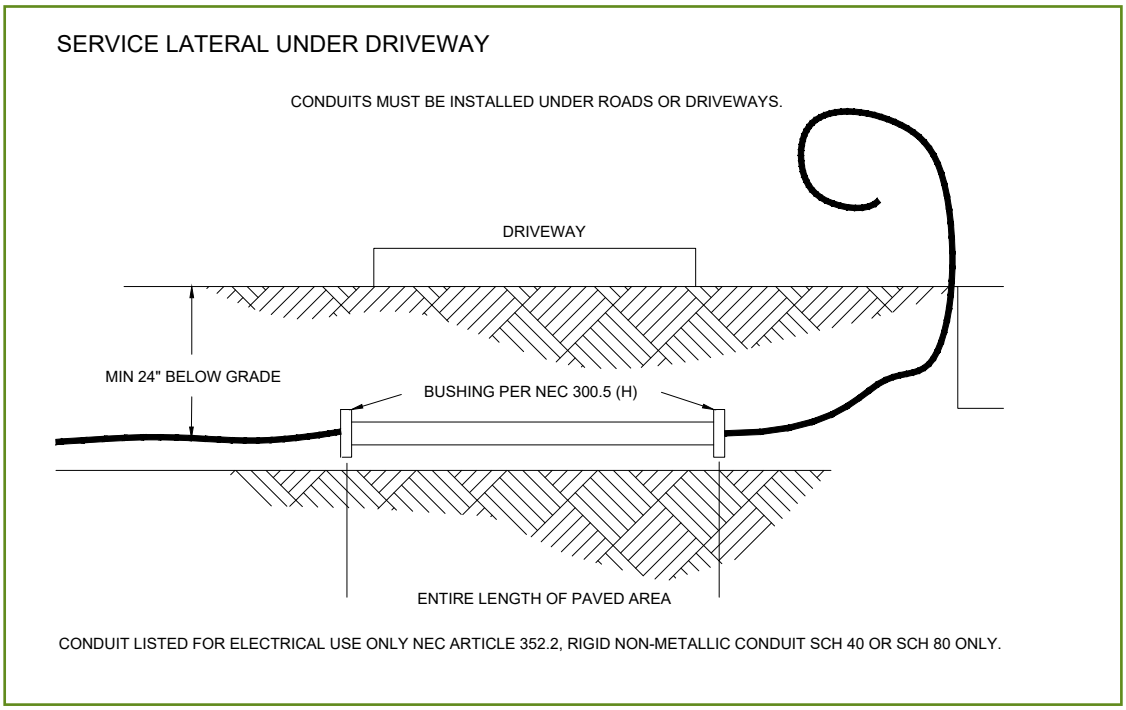


Figure 24

4 – 18 Continuous Service Lateral Riser

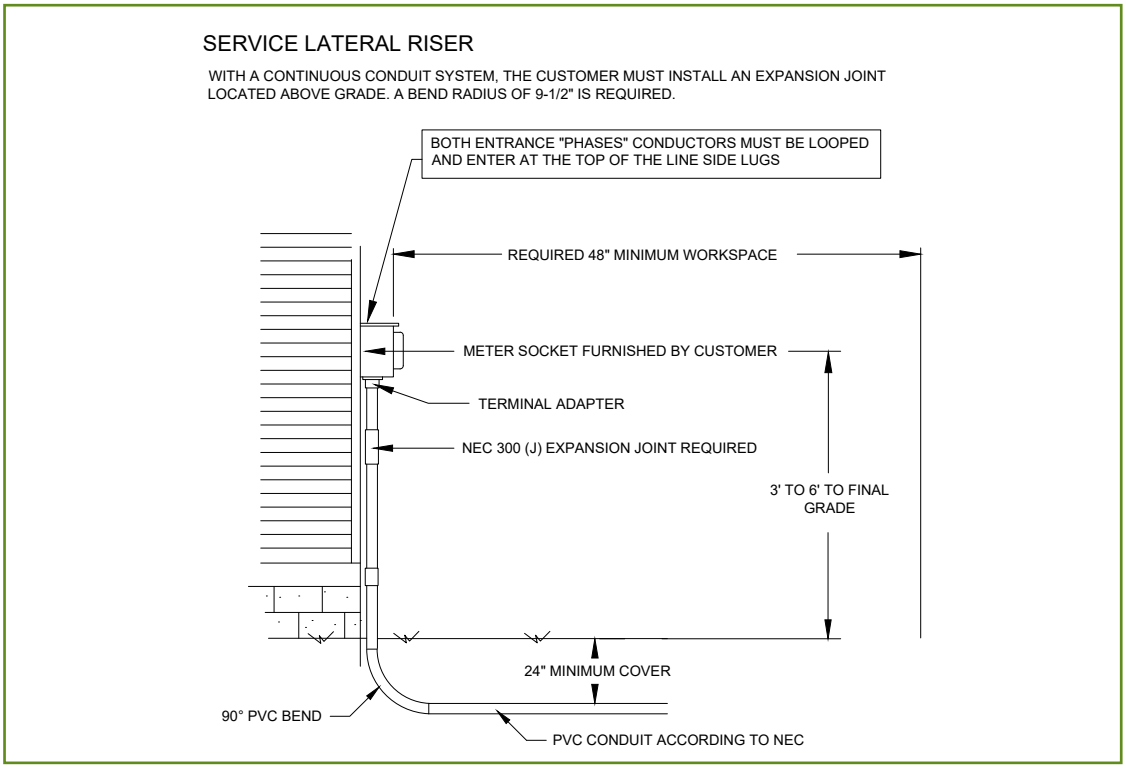


Figure 25

4 – 19 Service Lateral Riser – Direct Buried

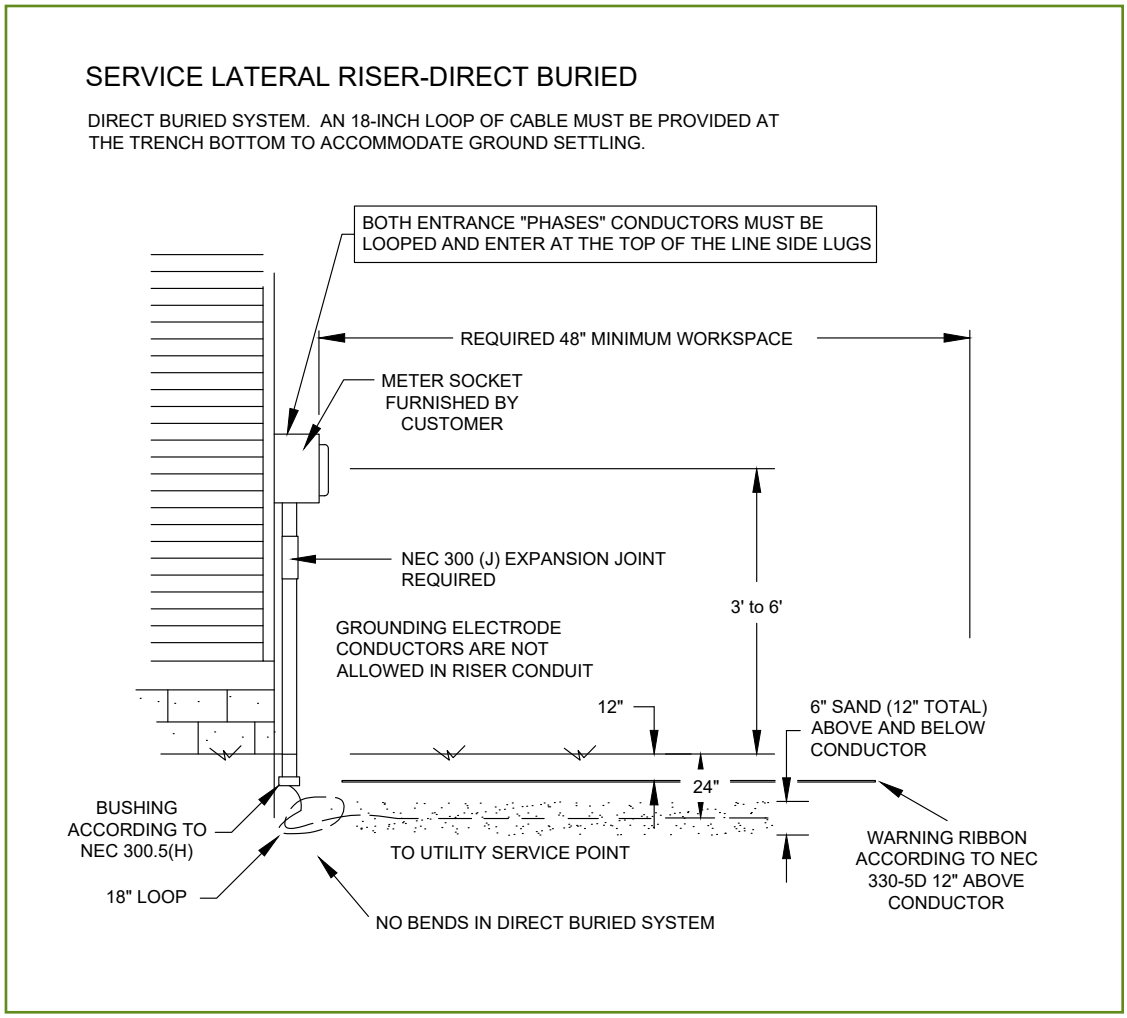


Figure 26

4 – 20 Common Utility Trench (See Requirements in Section 4 and 10)

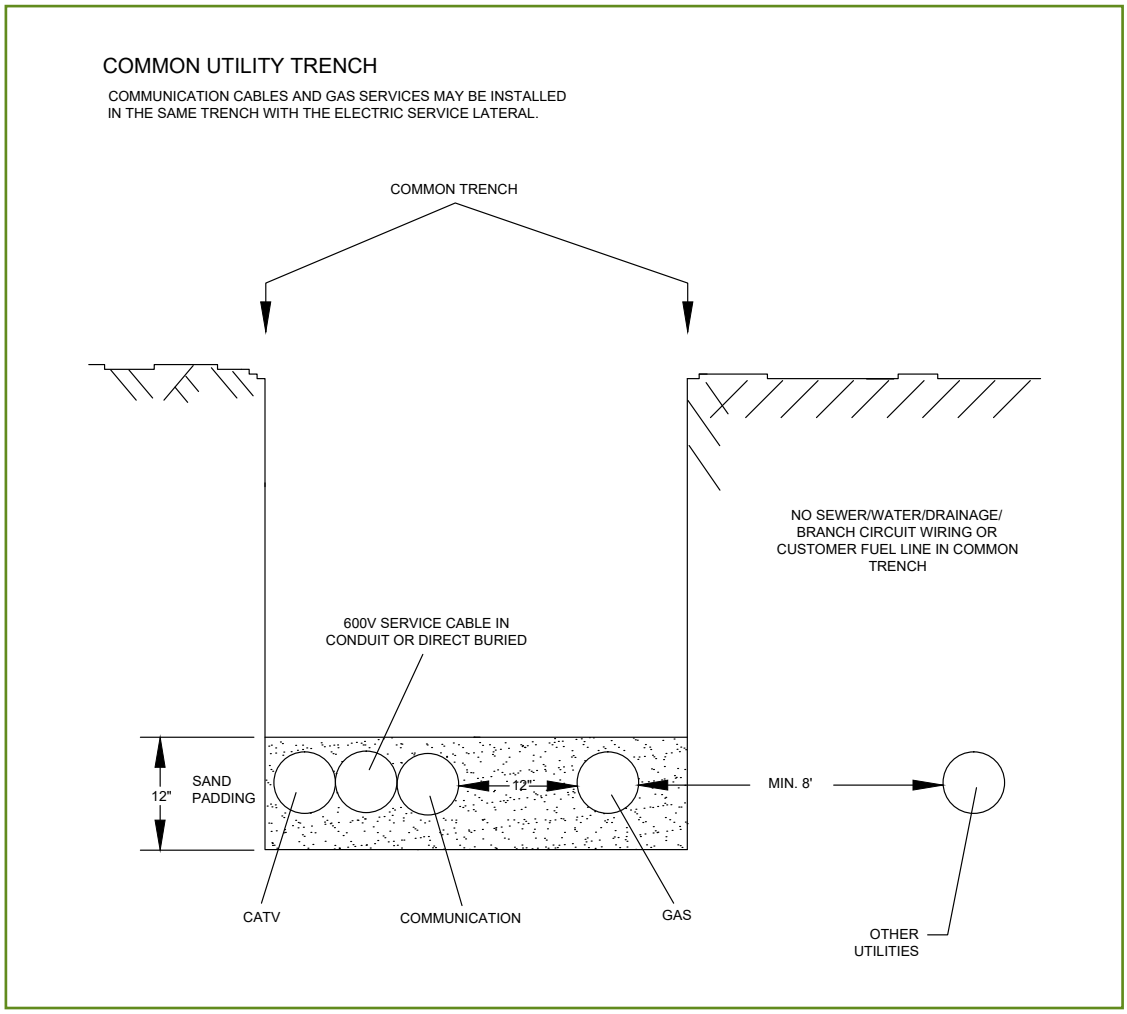


Figure 27

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 20a Customer/Contractor

- Contact the appropriate utility to coordinate the communication cable installation. The trench width will vary depending on occupancy from a minimum of eight inches for electric, telephone, and CATV, to 18 inches when a gas fuel line is included.
- Ensure a 12-inch separation between all cables and the gas fuel line.

  Note: Under no circumstances will other occupants such as sewer, water, drainage systems, feeders, or branch circuit wiring be allowed in the service trench.
- Maintain a minimum eight-foot separation from other occupants to the service lateral.
- Maintain a minimum of two feet of vertical separation if other utilities cross the common trench.

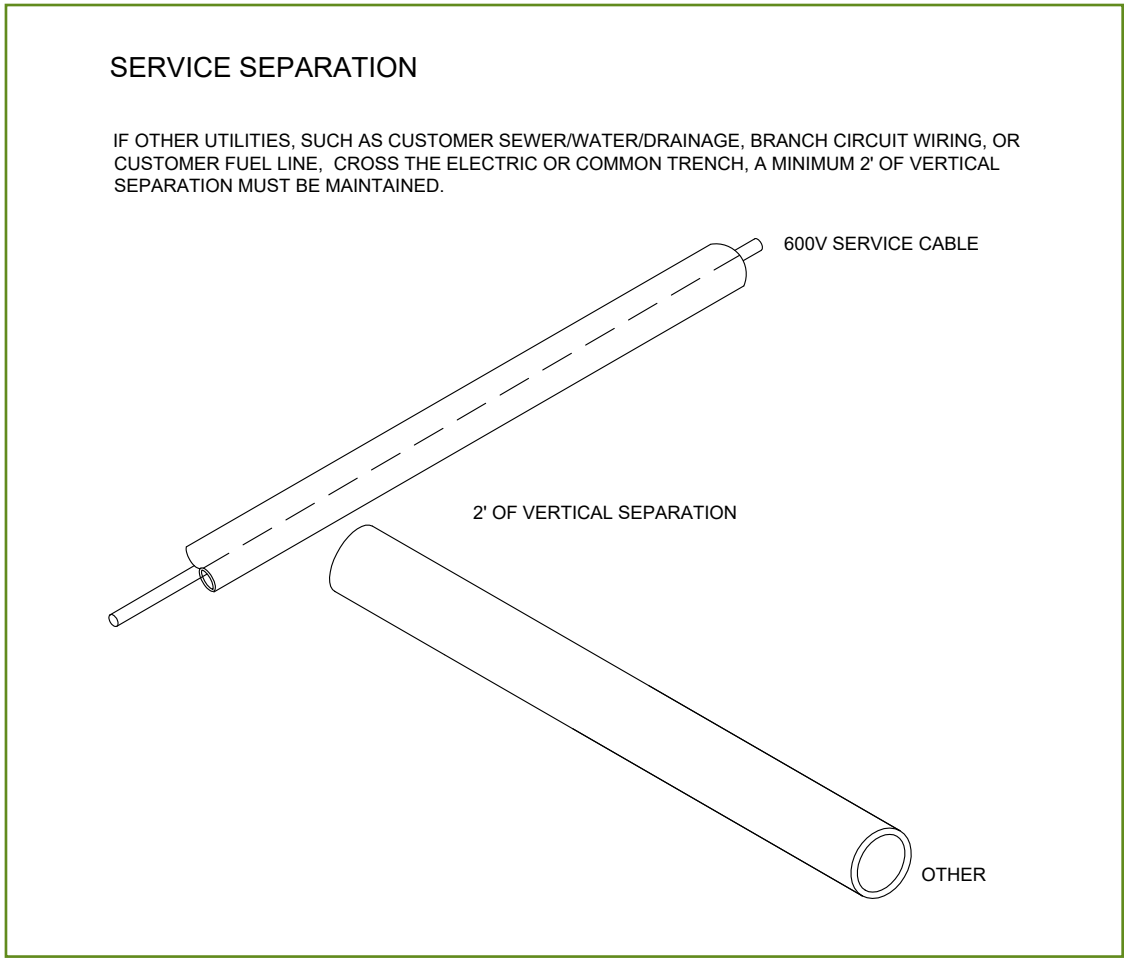
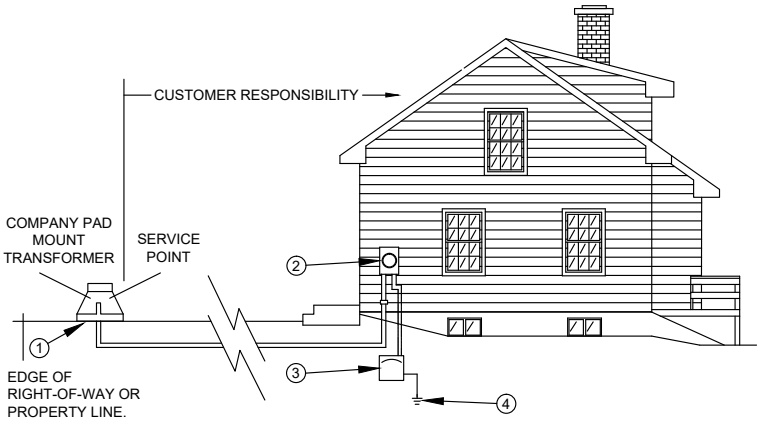


Figure 28

4 – 21 Underground Residential Distributions (URD)

UNDERGROUND RESIDENTIAL DISTRIBUTION (URD)

CUSTOMER-INSTALLED UNDERGROUND SERVICE LATERALS MUST BE MAINTAINED BY THE CUSTOMER. THE INSTALLATION MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND THE COMPANY SPECIFICATIONS WHEN APPLICABLE. THE APPLICANT MUST PROVIDE, INSTALL, AND MAINTAIN ALL SINGLE-PHASE METER BOXES.



10' MINIMUM SPACE REQUIREMENT FOR TRANSFORMERS FOR URD INSTALLATIONS IN SUBDIVISIONS FROM ANY STRUCTURE WALL.

CHECK LIST-BEFORE OBTAINING AN ELECTRICAL INSPECTION APPROVAL AND SCHEDULING WITH COMPANY

1. CABLE INSTALLED AND PROTECTED ACCORDING TO COMPANY REQUIREMENTS AND THE NEC
2. CONDUCTORS TERMINATED IN METER BOX ACCORDING TO COMPANY REQUIREMENTS AND THE NEC
   - A. UL-LISTED CERTIFICATION
   - *B. INSPECTION STICKER ON WALL OF ENCLOSURE
3. CONDUCTORS TERMINATED IN MAIN DISCONNECT PANEL ACCORDING TO THE NEC
4. MAIN DISCONNECT PANEL GROUNDED ACCORDING TO NEC

* ELECTRICAL INSPECTION STICKER OF CERTIFICATION REQUIRED ON METER BOX:

1. NEW SERVICE INSTALLATION
2. CUSTOMER REWIRES AND/OR SERVICE UPGRADES
   - B. SCHEDULES ELECTRICAL INSPECTOR ON SITE AFTER COMPANY DISCONNECTS SERVICE FOR CUSTOMER TO INSTALL SERVICE AND RECONNECTED BY THE COMPANY

Figure 29

General
Underground residential distribution (URD) systems are provided to a government-approved subdivision consisting of five or more dwelling units or to a multiple dwelling of four or more units. Underground systems are required for most new residential developments. The design and installation of this type of system requires close coordination between customer/developer and the company. The company must be consulted during the earliest planning stages. Information on URD and related installation costs is available through the company's website. The company will not install the underground electric facilities until water and sewer are installed and the site is within six inches of final grade. The developer must rough grade the easement strip, and place and maintain construction survey stakes indicating grades, property lines, and location of other utilities. The service cable and its installation must be in accordance with the NEC and company requirements and must be maintained by the party of ownership.

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

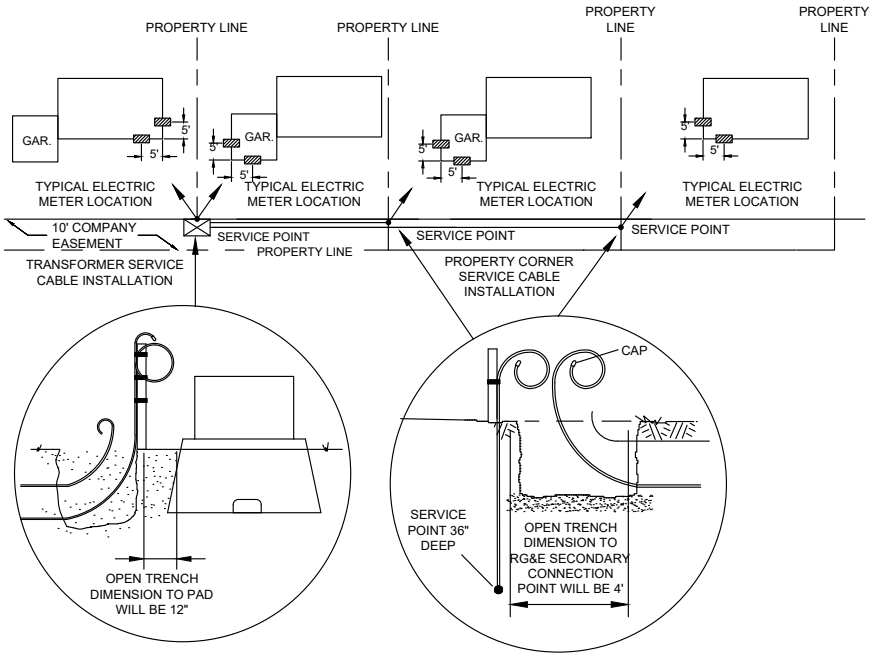
4 – 21a Customer/Contractor

- Ensure trench is open for inspection by the authority having jurisdiction before backfilling.
- Correct the violation and then have the same agency reinspect, if the service fails to meet approval.

4 – 22 Service Point and Meter Locations

SERVICE POINT AND METER LOCATIONS

THE METER BOX MUST BE A MAXIMUM OF 5 FEET FROM THE BUILDING CORNER (INCLUDING GARAGES) CLOSEST TO THE COMPANY'S SERVICE POINT (TRANSFORMER OR PROPERTY CORNER). THE METER BOX MUST HAVE A UL-LISTED LABEL.



● SERVICE POINTS: CONNECTIONS TO COMPANY DISTRIBUTION SYSTEM

CONTRACTOR MUST REFER TO THE COMPANY ENGINEERING SKETCH FOR SERVICE POINT LOCATION. THE BUILDER/DEVELOPER HAS THE SKETCH ON FILE AND THE SERVICE REQUEST WILL BE RETURNED WITH THIS INFORMATION. IF THE CONTRACTOR RUNS THE SERVICE TO THE WRONG SERVICE POINT LOCATION, THE SERVICE WILL NOT BE ENERGIZED AND IT WILL HAVE TO BE RELOCATED AT THE CONTRACTOR'S EXPENSE TO THE RIGHT LOCATION. COMPANY MAY CHARGE FOR A SECOND TRIP.

Figure 30

4 – 23 Permanent Service Prior to Framing

SERVICE PRIOR TO FRAMING

PERMANENT CUSTOMER-INSTALLED UNDERGROUND SERVICE LATERAL MAY BE ENERGIZED PRIOR TO FRAMING OF THE BUILDING (RESIDENTIAL APPLICANTS ONLY), ONLY IF THE SERVICE MEETS NEC REQUIREMENTS FOR WEATHERPROOFING SERVICE EQUIPMENT IN AN EXPOSED BASEMENT.

FOR WEATHERPROOFING, CUSTOMER MUST INSTALL A PLASTIC COVER SEAL TIGHT TO BASEMENT WALL OR INSTALL THE DECK.

PANEL MUST BE GROUNDED ACCORDING TO NEC REQUIREMENTS.

METER BOX MUST HAVE PROPER SUPPORT, AND THE METER BOX MUST HAVE A "UL APPROVED" LABEL.

SUPPORT METERING WITH A WOODEN STRUCTURE SECURED TO FOUNDATION

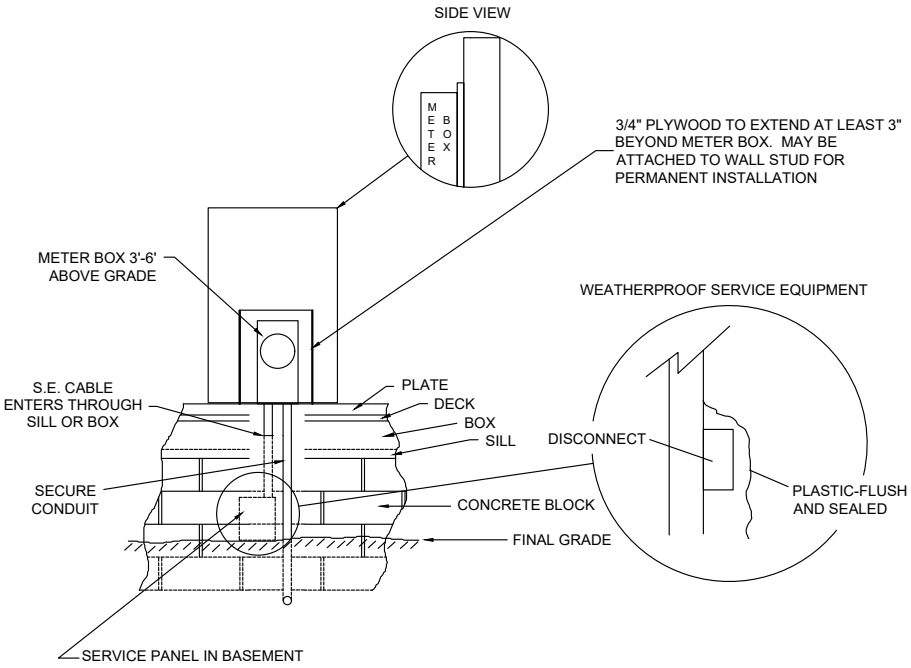


Figure 31

4 – 24 Non-Residential Overhead Services

General
A Non-Residential overhead service is a service that feeds single-phase or three-phase to a person, corporation, or other entity who is not a residential applicant requesting overhead service from the company. Generally, an overhead service drop is limited to supply service rated 800 amperes or less. The company recommends an underground service for services larger than 800 amperes.

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 24a Customer/Contractor

- Install all three-phase metering equipment (refer to Section 8 for metering requirements).
- Provide and install service drop 600-volt insulator attachments for single-phase and three-phase services.

4 – 24b Company

- Designate the location of the service, if there is an obstruction or clearance issue.

4 – 25 Non-Residential Underground Service Connections from Overhead Lines Less Than 600 Volts

General
A Non-Residential underground service is a service that feeds single-phase or three-phase to a person, corporation, or other entity who is not a residential applicant requesting underground service from the company.

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 25a Customer/Contractor

- Consult with the company if requesting a single-phase or three-phase underground service lateral from the company's overhead distribution line.

- Contact the company before work begins to designate the service point at the pole, the conduit location from which service will be taken, the route to be followed, and the meter location.

  Note: If the municipality refuses to permit the overhead crossing, the customer is responsible for obtaining a permit, then excavating or boring, and installing the road crossing to the company's existing distribution facilities according to company specifications.

  Note: For Non-Residential underground services, an exception may be made for more than two conduits on the pole. **The exception must be approved by company engineering and meet the NEC requirements so that the service cables meet the service loading.**

- Install standpipe and bend. (Refer to Figure 32 on page 52)

- If #2 ground wire is already installed on the pole, it can be used for grounding customer standpipe.

4–25b Company

- Install a pole and appropriate guy on the customer premises to be served, if the company's distribution is on the opposite side of the highway. Charges may be applied according to the *Tariff Schedules for Electric Service.*

- Number of service conduits for Non-Residential will be proposed to company with sets of cables, RG&E engineering to review and approve before installed. If cables are larger than 4/0 AWG, the customer or contractor will schedule for the company to do its work at the time the cable is being installed.

- Provide and install, without charge, the protective covering above the standpipe, the necessary cable supports and fittings.

- Connect the cable to its secondary system.

4 – 26 Standpipe and Bend

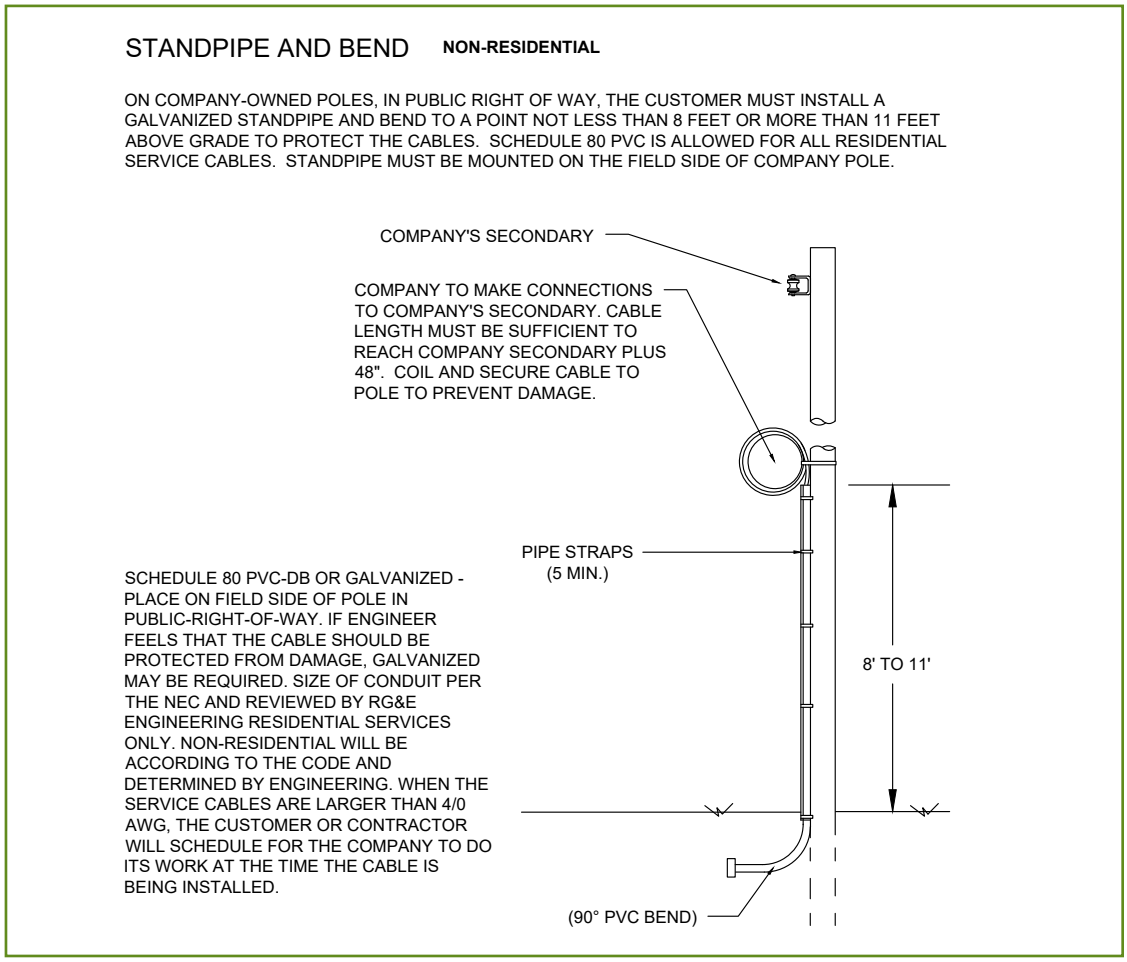


Figure 32

In addition to fulfilling the requirements listed in Section 4 – 1a and 4 –1b, these additional requirements apply.

4 – 27 Non-Residential Underground Service Connection in Padmounted Transformers

General

A Non-Residential underground service is a service that feeds single-phase or three-phase to a person, corporation, or other entity, who is not a residential applicant, requesting underground service from the company.

4 – 27a Customer/Contractor

- Provide the company with final approved site plans.
- Allow sufficient lead time for the company to design the underground electric facilities.
- Provide property on which to construct the transformer foundation and paved access by vehicle to the transformer pad according to company requirements.
- Install, own, and maintain the concrete pad foundation for the transformer according to company specifications.
- Ensure proper grounding system is in place.
- Install and maintain service laterals, service cables, and conduits in accordance with the NEC and company requirements.
- Ensure cables are long enough to form a coil at the floor of the pad to the roof, plus eight feet of additional cable for support.
- Ensure cables are insulated and terminated at the **dead** transformer end with Burndy Type YA or approved equivalent type lugs, one-half-inch stainless steel or bronze bolts, washers, and nuts, according to company specifications. The customer must purchase bronze bolts, washers, and nuts, and ensure that these lugs have a two-hole NEMA drilled tongue and a long shank for a minimum of two compression indents one-and-three-quarter inches in width.

  Note: If there is an existing padmounted transformer, the customer must make shutdown arrangements to de-energize the transformer. In addition, the customer must pull in new service cables terminated with one-and-three-quarter-inch lugs according to company specifications. The company must terminate on the transformer's two-hole spade on the customer's additional cables.
- Contribute to the cost of the service connection as well as the charges associated with the shutdown if it occurs after regular working hours.

  The company will refuse to energize services until all requirements are met.

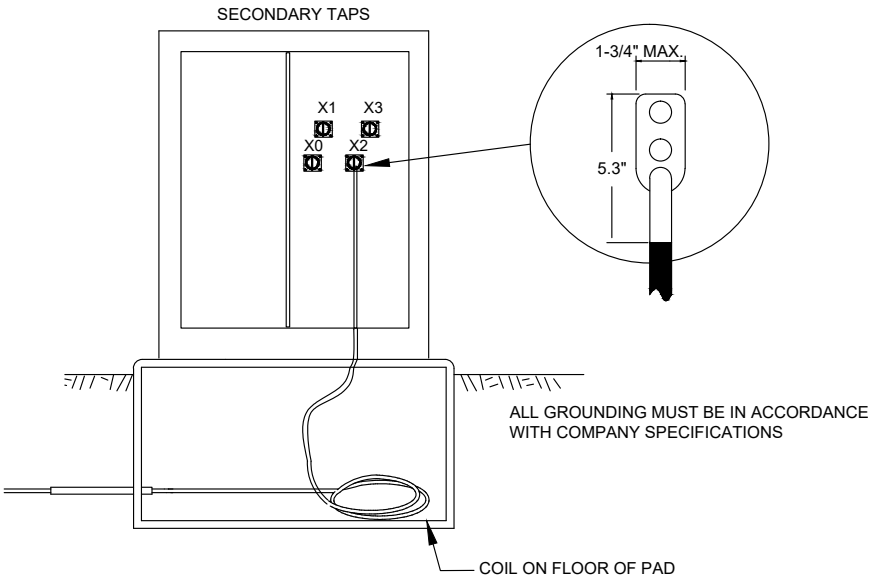
4 – 27b Company

- Provide underground distribution systems to Non-Residential service loads using at-grade transformers and switchgear.
- Supply design requirements for the installation of this type of service.
- Provide to the customer a copy of the design sketch and copies of the company standards for Outdoor Three-Phase Padmounted Transformer and Customer Provided Primary Conduit Systems. The company will provide the sketch and cost estimate.

PADMOUNTED TRANSFORMER

THREE-PHASE PAD-MOUNTED INSTALLATIONS MUST BE INSTALLED IN ACCORDANCE WITH COMPANY SPECIFICATIONS.

THE CUSTOMER'S CABLES MUST BE INSULATED STRANDED CABLE TERMINATED AT THE TRANSFORMER END WITH BURNDY TYPE YA (OR APPROVED EQUIVALENT) COMPRESSION-TYPE LUGS. THESE LUGS MUST HAVE A TWO-HOLE NEMA-DRILLED TONGUE AND A LONG SHANK FOR A MINIMUM OF TWO COMPRESSION INDENTS 1 3/4" WIDE. THE CUSTOMER MUST TERMINATE THE LUGS ON THE DE-ENERGIZED TRANSFORMER SPADES ACCORDING TO COMPANY REQUIREMENTS.



THE CUSTOMER/DEVELOPER MUST INSTALL, OWN, AND MAINTAIN THE CONCRETE PAD FOUNDATION FOR THE TRANSFORMER. THE FOUNDATION MUST BE INSTALLED IN ACCORDANCE WITH COMPANY SPECIFICATIONS.

Figure 33

SECTION 5 Service Equipment

5 – 1 Customer Service Equipment

5 – 1a Customer/Contractor

- Provide each service entrance with disconnecting means and overload protection.
- Install the service equipment in a clean, dry, readily accessible location as near as practical to the service entrance point. Service equipment must conform to NEC and applicable local requirements.
- Ensure the voltage rating is suitable to the service available.
- Ensure an ampere rating that is adequate for the initial and anticipated future load current requirements. The device must be capable of interrupting load current at its ampere rating.
- Ensure a short-circuit current interrupting capability at the service voltage of not less than the value specified by the company and NEC Article 110-9. (See section 15 for available fault current data)
- Conform with the latest standards of American National Standards Institute, Inc. (ANSI)
- Consider using a circuit breaker as a disconnecting means, which meets these requirements:
  - An operating mechanism of mechanically trip-free construction.
  - An overload-tripping device on each pole arranged for delayed over-current protection with instantaneous tripping for currents of fault magnitude.

5 – 1b Company

- Determine the short circuit current available from its system at the service location, upon request.

5 – 2 Service Greater Than 400 Amperes

Note: In most cases, metering transformers are required for this type of installation.

5 – 2a Customer/Contractor

- Contact company to discuss this type of service installation and the related requirements.
- Install equipment in accordance with the NEC and company requirements.
- Provide connections made ahead of the main service equipment for fire pumps, control power for circuit breakers, etc., with disconnecting means and overload protection adequate for the duty. Such connections must be made only when in compliance with the NEC, where specifically approved by the company and the authority having jurisdiction, and must be metered, either by the existing meter or an additional meter.

5 – 2b Company

- Provide the equipment that is to be installed by the customer (CT Metering).
- Connect all power and control conductors.

5 – 3 Service Greater Than 600 Volts

General
Service greater than 600 volts is supplied where conditions warrant. A cost is associated with the higher voltage metering installation. The company designates the type of service available and nominal voltage.

The location of the service equipment and the general electrical arrangements are selected by mutual agreement between the customer and the company.

5 – 3a Customer/Contractor

- Consult with the company regarding its requirements for basic insulation level (BIL), protective equipment, metering facilities, short circuit data, relay recommendations, etc.
- Supply a fused load break switch (manual or automatic) on the load side of the company's metering.
- Submit detailed plans and loading information to the company prior to the purchase of equipment or proceeding with the installation (e.g., switchgear, transformers, etc.).

  More detailed information is available by obtaining a copy of the Metal Clad Switchgear Guidelines booklet. The publication is available at the company's regional offices upon request.

  Remember to follow NEC and company requirements to make every service installation a safe one.

5 – 3b Company

- Approve metal-enclosed switchgear prior to customer purchase.

SECTION 6 Network Services

6 – 1 General

The majority of the network grid is located within the City of Rochester's downtown Inner Loop. The company informs the customer regarding the number and size of the service conductors and the magnitude of the short circuit that the service equipment may be called upon to interrupt. It is important that the customer or agent contact the company regarding any new installations or alterations on network services.

These are general standards of the network system and requirements:

- The majority of the services are 120/208 volt.
- The short circuit rating for the 120/208 volt network grid is 100,000 amperes.
- Network services above 800 amperes require a cable limiter junction box.
- The company engineer determines the requirements for service for 277/480 volt spot network services.
- Any single-phase 120/208 volt metering 200 amperes or less requires a 5th jaw to be furnished and installed by the customer according to the manufacturer's specifications.

SECTION 7 Grounding

7 – 1 General

The grounding electrode conductor will not be terminated in the meter box (meter socket enclosure).

Exceptions: For temporary metering, load center (distribution point NEC 547.2) poles where there is no disconnect, CT and three-phase metering, the company recommends #4 AWG minimum copper grounding electrode conductor. Achieving a resistance to ground value that exceeds the NEC requirements provides better protection from lightning transients and can help improve power quality.

The company is not responsible for problems or damage to customer equipment due to a less-than-optimum grounding electrode system.

SECTION 8 Meters and Meter Sockets

8 – 1 Meter and Meter Sockets

8 – 1a Customer/Contractor

- Consult with the company for service greater than 400 amperes or 600 volts.
- Provide a company-approved meter socket or meter transformer enclosure as part of the service equipment for multi-socket panel assemblies or prewired combination meter and service equipment pedestals. This is subject to advance approval by the company. The customer is responsible for maintenance and repair of this equipment.
- Install metering transformers for service above 400 amperes, in most cases.
- Contact the company to discuss the service equipment requirements and arrangements.
- Install Number 4 AWG copper grounding electrode conductor from CT meter sockets and all three-phase, self-contained meter sockets to an exposed five-eighths-inch by eight-foot driven ground rod.
- All meter installations with multiple meters shall be labeled permanent marking per NEC articles 110 and 230.
- Do not use meter mounting boxes as junction boxes.

  Note: Customer devices cannot be installed on the line (supply) side of any meter except:
  – Those installations consisting of more than six meters on a single service entrance.
  – Self-contained meters for services above 240 volts (up to 400A).

  Gutters, pull boxes and main distribution panels ahead of the meter are not permitted. For these two exceptions the customer disconnect must be installed on the line side of the meters.
- Connect metering on the line side of the service equipment, except as Noted in this section. Mechanical/high pressure connections may be allowed in metering equipment as specified by the company.

  Unauthorized jumpers are not allowed in meter boxes; no lubricant is allowed to be applied to any meter socket jaws. The company must approve all exceptions.
- Ensure that metering enclosures greater than 400 amperes serving more than one service entrance have a disconnecting device capable of disconnecting all loads served by that meter.
- Ensure that there is a minimum of four feet of clearance in front of the meter.

  Note: All meter sockets and enclosures must comply to the latest revisions of ANSI/UL 414, ANSI CI 2, NEMA 250 and must carry the UL label. They must be of ringless design with bypass horns and have a sealing mechanism, which allows the cover to be sealed. In addition, meter techs must be consulted before purchasing any equipment for non-residential applications.

8 – 1b Company

- Provide and connect all meters and associated equipment required for billing purposes.
- Provide the equipment that is to be installed by the customer.
- Connect all power and control equipment.
- Seal all meter facilities and all points of access to unmetered wiring on customer's premises.
- Refuse to connect the service if the customer installation is defective, or is in violation of company or NEC standards. Unauthorized jumpers are not allowed in meter boxes; no lubricant is allowed to be applied to any meter socket jaws. The company must approve all exceptions.

8 – 2 Meter Location

General
It is in the interest of both the customer and the company that a suitable and adequately protected meter location be provided to ensure accuracy and to facilitate installation, reading, and maintenance.

All metering equipment must be readily accessible to company personnel at all times.

Meter Separation
The company requires that the meter location for all new installations for residential service be installed outside. If the meter is indoors, the meter must be relocated to the outside of the building structure for rewiring or upgrading of services.

Meters supplied from new underground residential systems must be located within five feet of the corner of the building nearest the service point from which the service will originate.

At locations where it is necessary to install four or more meters adjacent to each other, the meters may be installed in a room provided for this purpose. Refer to *Multiple Metering Installations*, Section 8-6, 8-9, for specific service requirements.

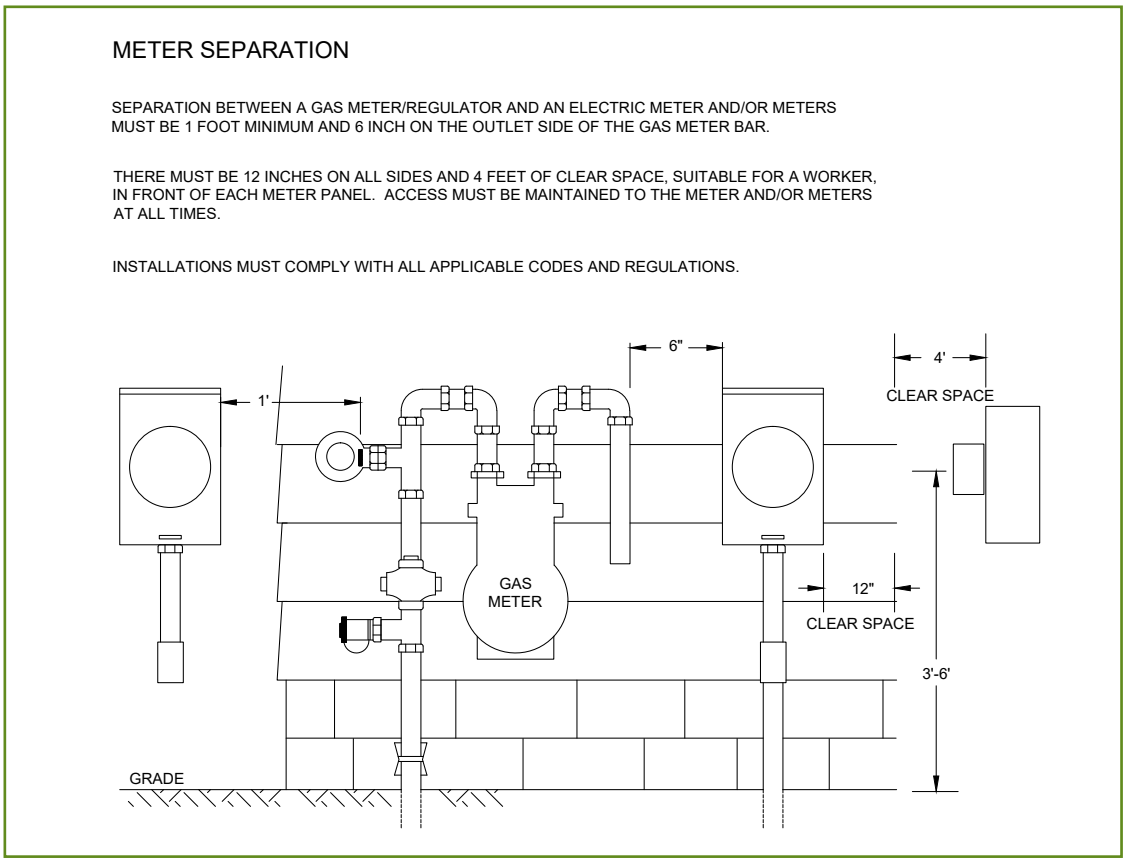


Figure 34

The metering equipment must be readily accessible and installed in locations free from vibration, dust, and corrosive atmospheres.

When the service is supplied from transformer vaults, meters must be located outside such vaults.

For customer load center pole installations, an over current disconnect device may be required. For these types of situations consult company engineering.

8 – 3 Meter Installations

All metering equipment, including service pedestals, must be adequately supported, securely fastened, and must be in a level and plumb position. Meter sockets must be installed such that the horizontal centerline of the meters will be no more than six feet, or less than three feet, above finish floor or final grade. Ensure that there is a minimum of four feet of clearance in front of the meter.

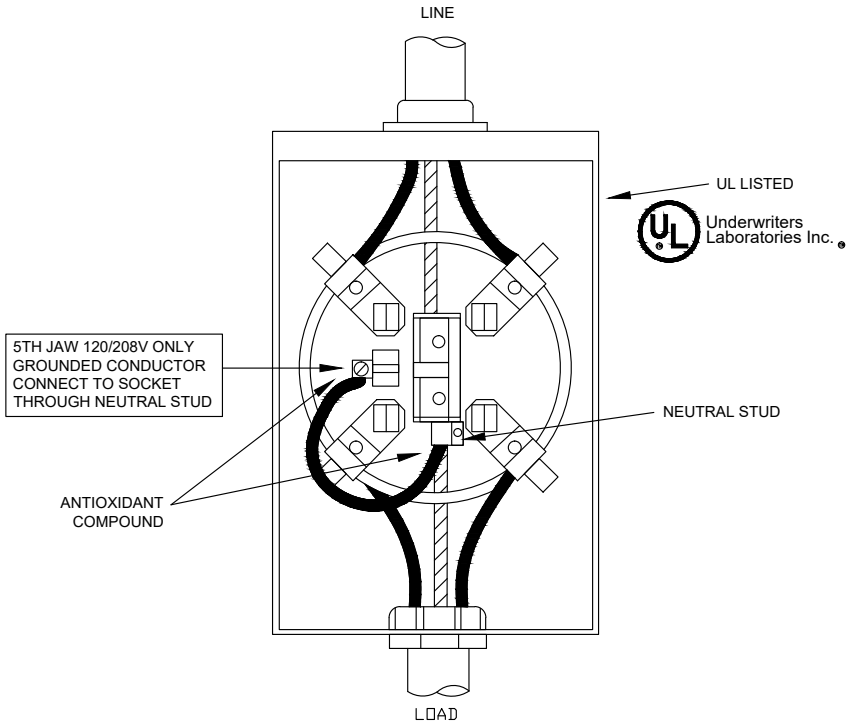
8 – 4 Single-Phase (Refer to Figures 35–38)

8 – 5 Overhead and Underground Meters

200 AMP OH METER BOX

SERVICE APPLICATION
200 AMP OH (ALSO 100 + 150 AMP)
1-PHASE, 3-WIRE 120/240V
*120/208V

FOR 1-PHASE RESIDENTIAL OR NON RESIDENTIAL APPLICATIONS



*FOR 1-PHASE, 3-WIRE, 120/208V APPLICATIONS, A COMPATIBLE 5TH JAW MUST BE INSTALLED IN THE METER SOCKET AT THE 6 OR 9 O'CLOCK POSITION. WHEN USING A 5TH JAW CONFIGURATION, THE 5TH JAW MUST BE MANUFACTURER APPROVED FOR THE METER SOCKET IN WHICH IT IS INSTALLED AND BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS.

Figure 35

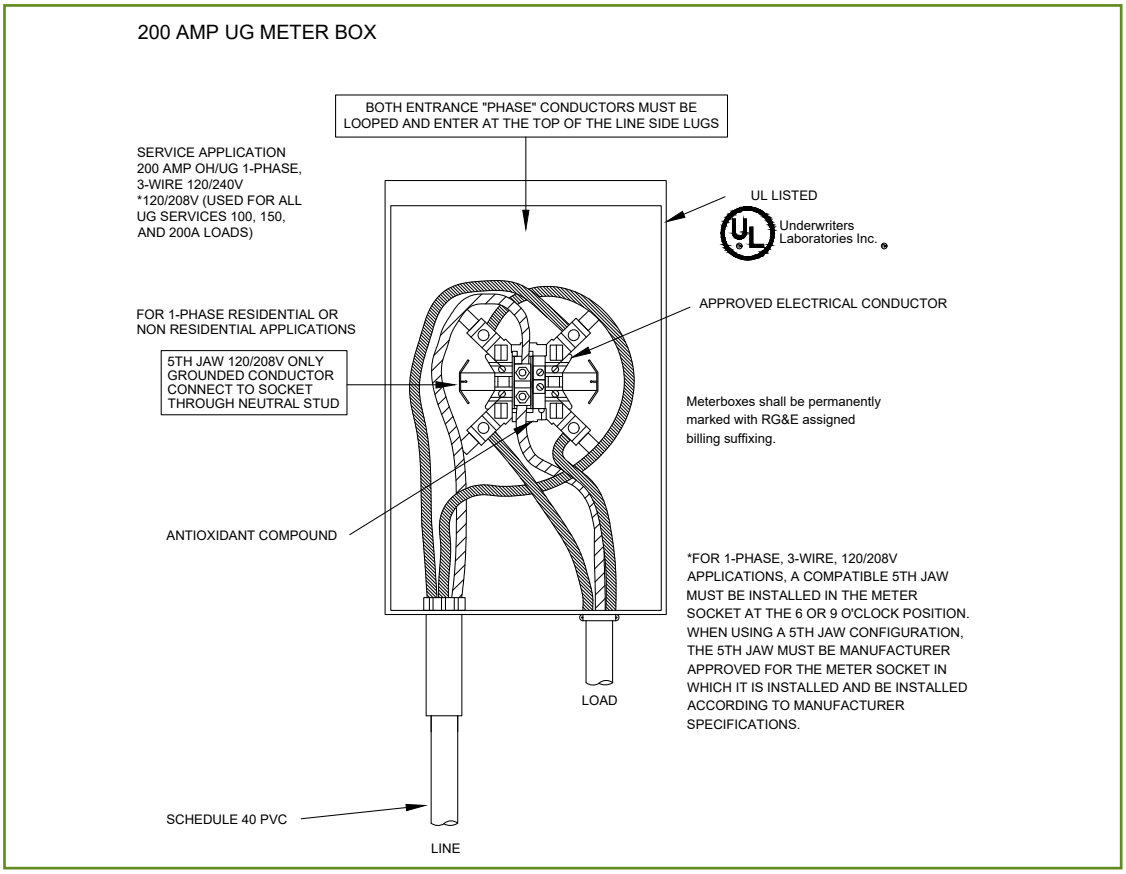


Figure 36

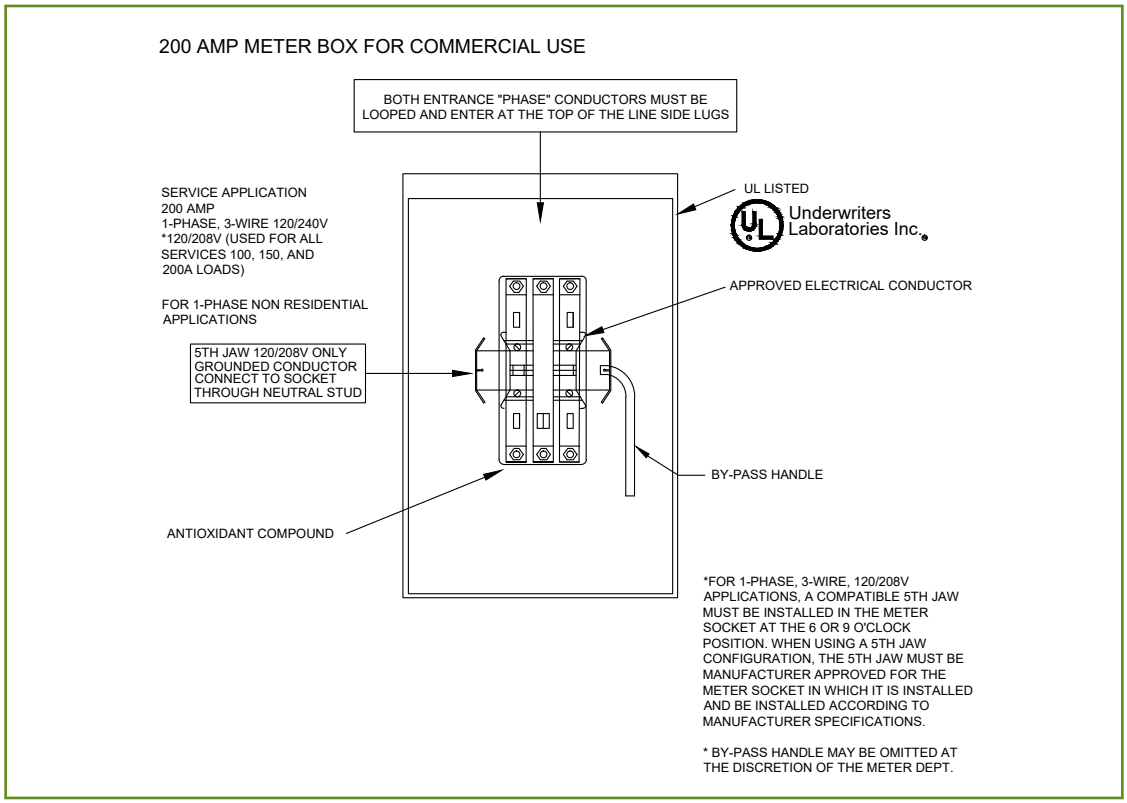


Figure 36A

8 – 6 Multiple Gang and 320 Amp Meter

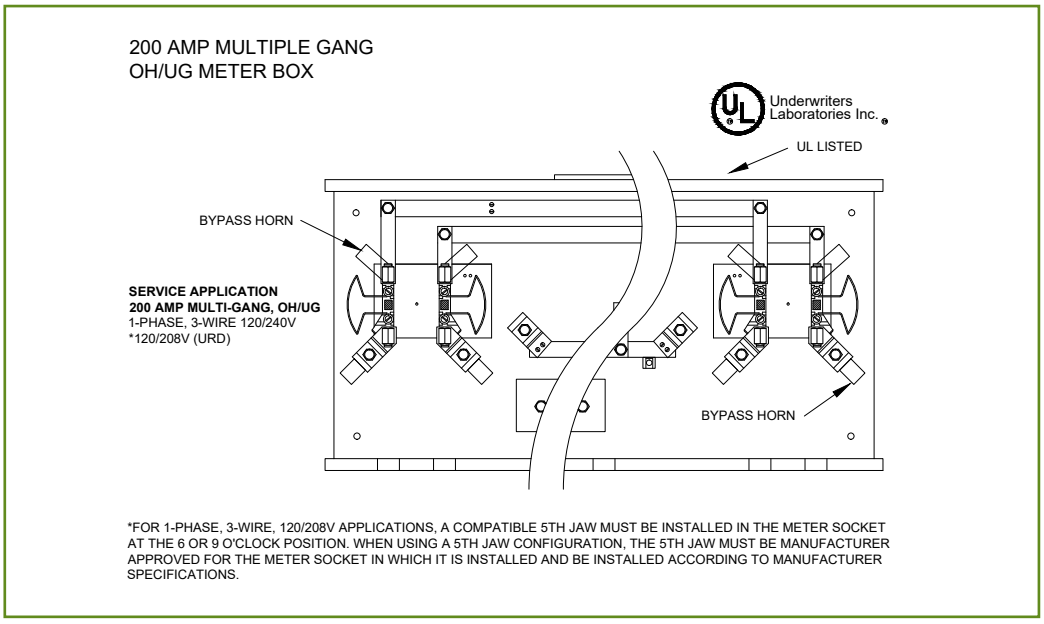


Figure 37

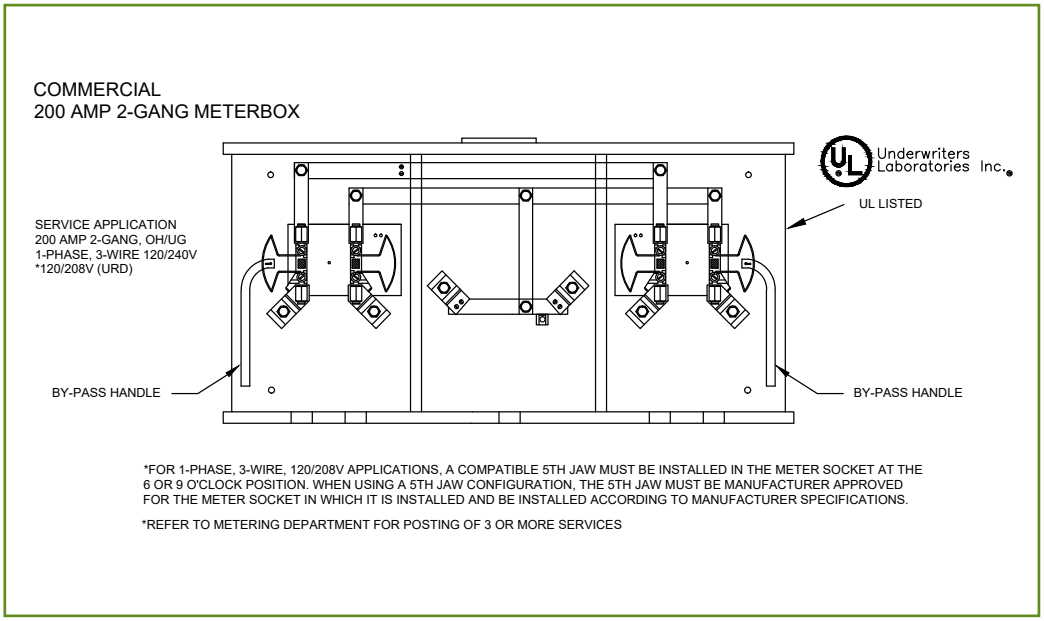


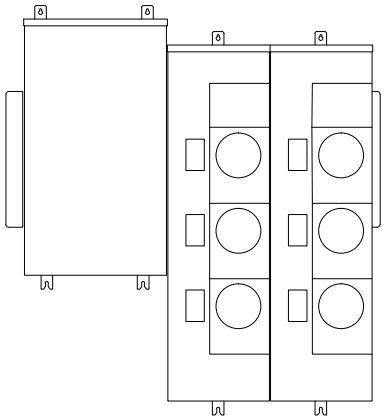
Figure 37A

MULTI-GANG METERBOX

SERVICE APPLICATION MULTI-GANG, OH/UG
1-PHASE, 3-WIRE 120/240V *120/208V (URD)
OR OH/UG 3-PHASE 4 WIRE
208Y/120V

Underwriters Laboratories Inc.®

UL LISTED



*FOR 1-PHASE, 3-WIRE, 120/208V APPLICATIONS, A COMPATIBLE 5TH JAW MUST BE INSTALLED IN THE METER SOCKET AT THE 6 OR 9 O'CLOCK POSITION. WHEN USING A 5TH JAW CONFIGURATION, THE 5TH JAW MUST BE MANUFACTURER APPROVED FOR THE METER SOCKET IN WHICH IT IS INSTALLED AND BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS.

*REFER TO METERING DEPARTMENT FOR POSTING OF 3 OR MORE SERVICES

*GREATER THAN SIX SOCKET POSITIONS REQUIRES A NON-FUSED MEANS OF DISCONNECT.

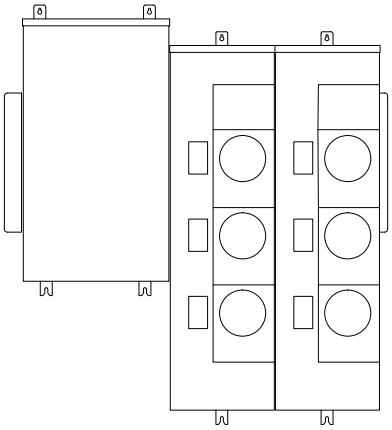
Figure 37B

MULTI-GANG METERBOX

SERVICE APPLICATION MULTI-GANG,
OR OH/UG 3-PHASE 4 WIRE
277/480V

Underwriters Laboratories Inc.®

UL LISTED



*REFER TO METERING DEPARTMENT FOR POSTING OF 3 OR MORE SERVICES.

*GREATER THAN SIX SOCKET POSITIONS REQUIRES A NON-FUSED MEANS OF DISCONNECT.

*MUST BE COLD SEQUENCE METERING.

Figure 37C

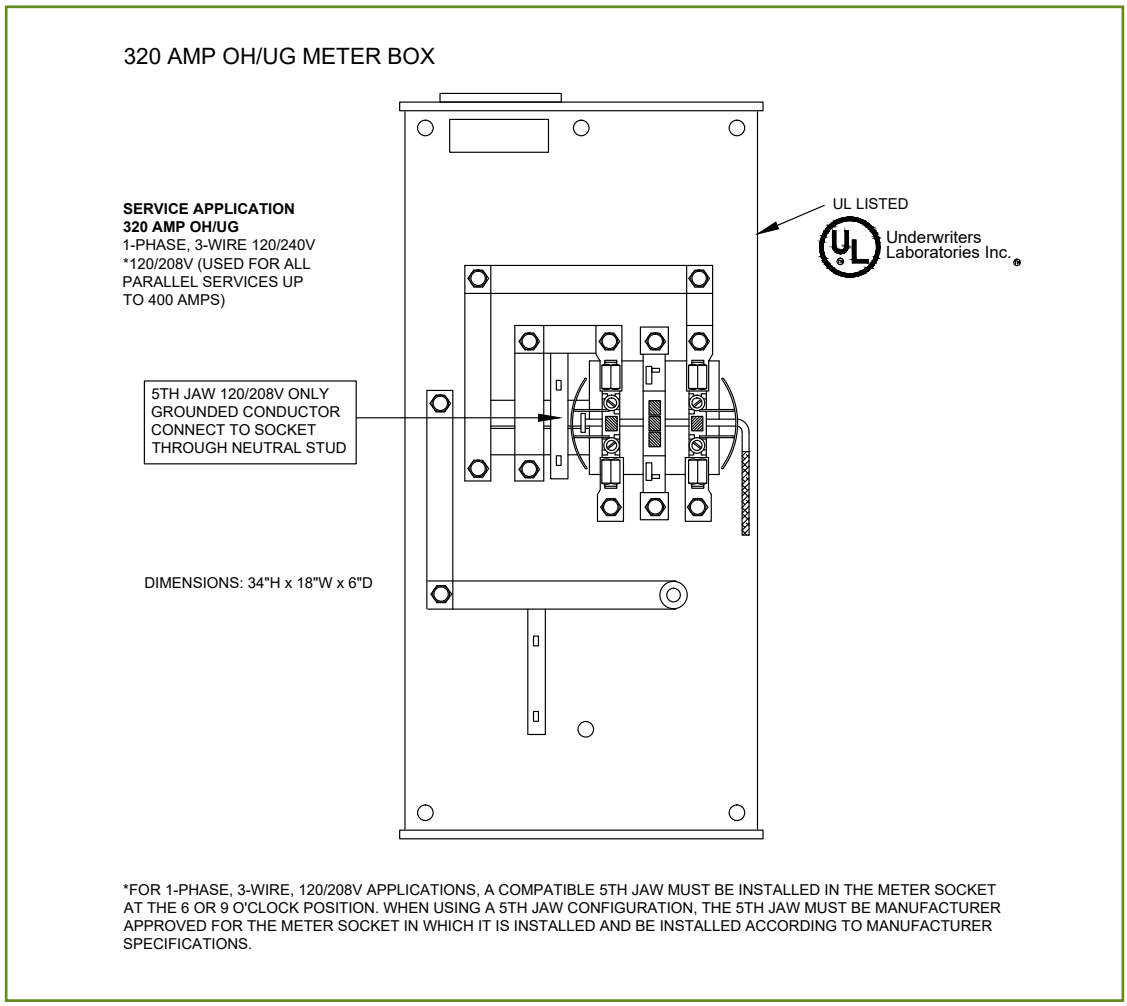


Figure 38

8 – 6a Customer/Contractor

- Provide, install, own, and maintain meter socket equipment approved by the company where electric service is less than 600 volts and the current is less than 400 amperes.
- Ensure that all meter sockets and enclosures comply with the latest revisions of ANSI/UL 414, ANSI C12.7, NEMA 250, and carry the UL label. Also, they **must be of ring-less design with bypass horns and have a sealing mechanism which allows the cover to be sealed**.
- Ensure when using a 5th jaw configuration that the 5th jaw is manufacturer approved for the meter socket in which it is installed and must be installed according to the manufacturer's specifications at the six or nine o'clock position.
- Provide and install approved service entrance cable or conductors.

- Provide and install a watertight connector where a cable entry is made in the top of a meter box.
- Purchase and supply any meter hubs and cover plates.
- Ensure that there is a minimum of four feet of clearance in front of the meter.
- Permanently mark meter boxes with RG&E assigned billing suffixing.

8 – 6b Company

- Spot new meter locations for Non-Residential service.

8 – 7 Three-Phase and Metering Transformers

3-Phase 4-Wire WYE 480/277v Self-Contained Meter Box

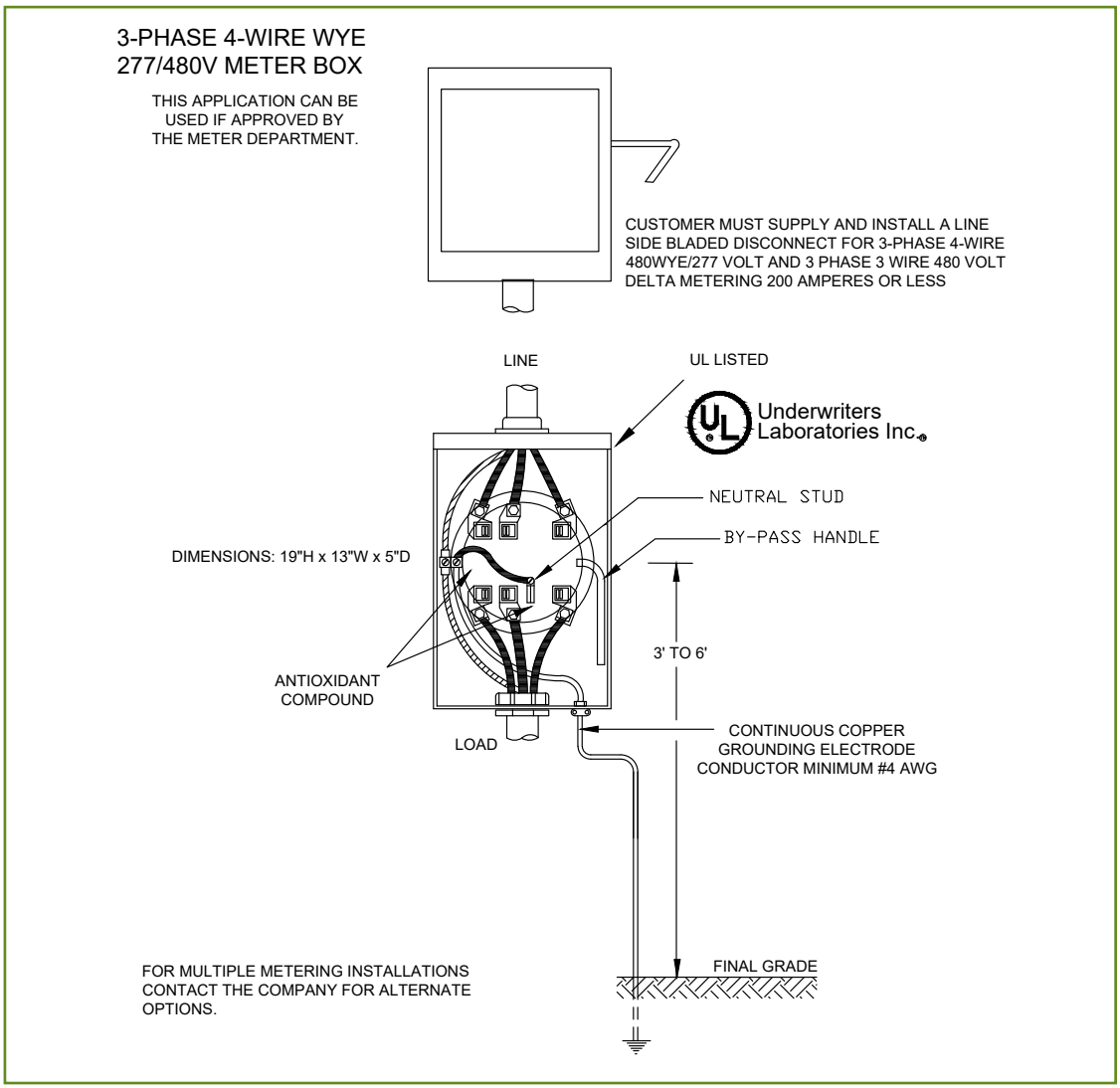


Figure 39

3-Phase 4-Wire Self-Contained Meter Box

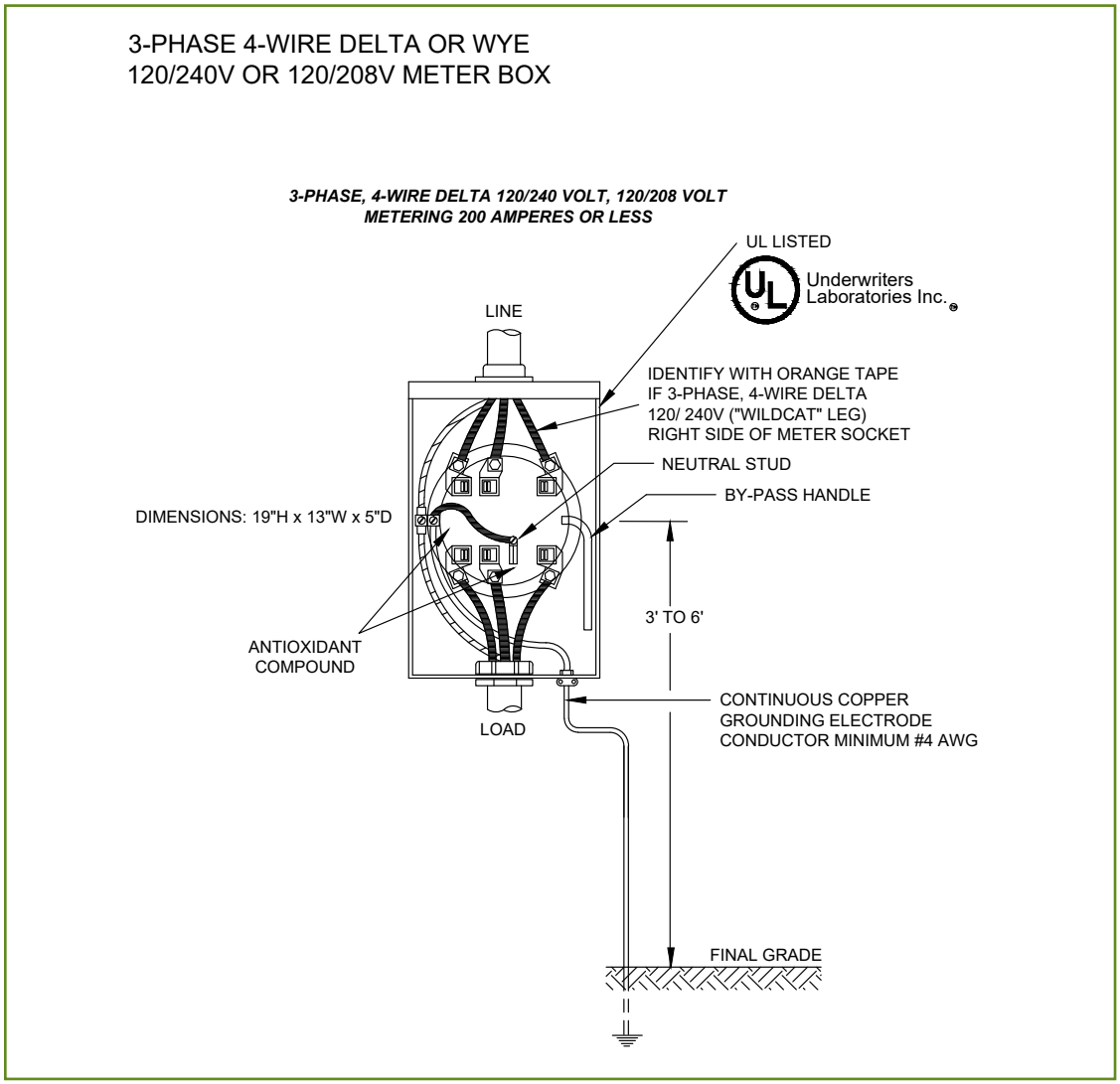


Figure 40

3-Phase 3-Wire Delta 480v Self-Contained Meter Box

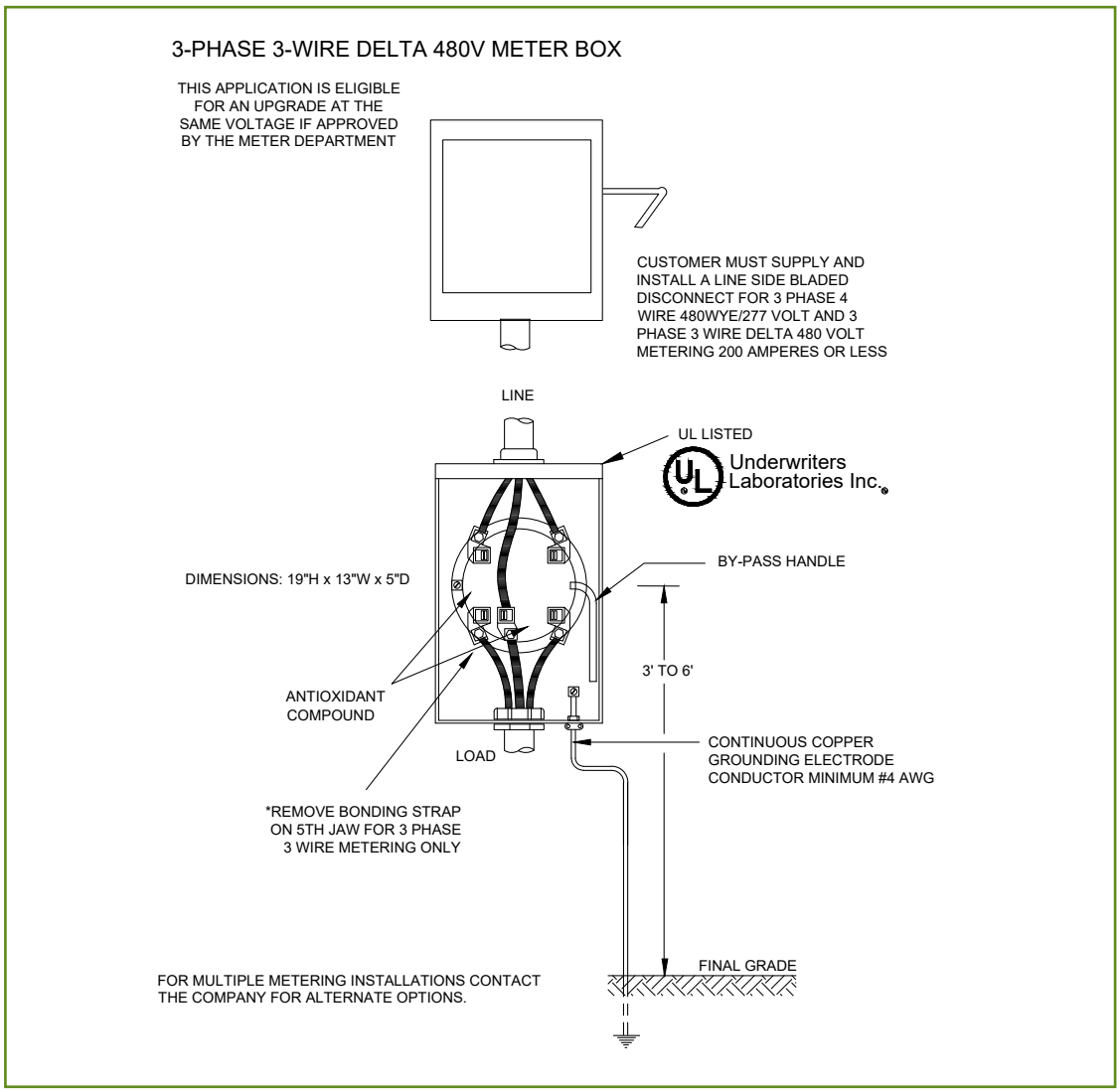


Figure 41

320 Amp 3-Phase 4-Wire OH/UG Meter Box

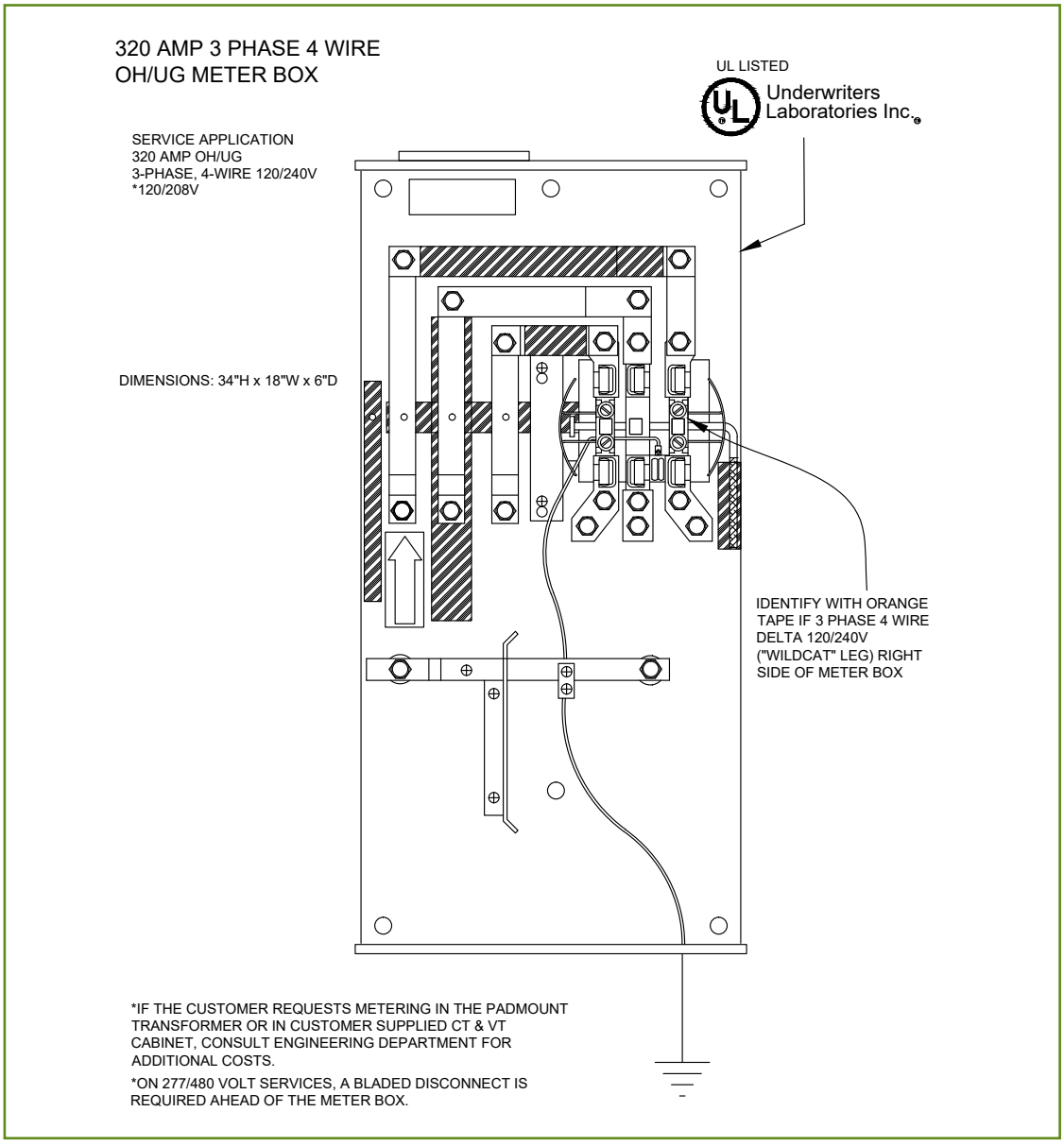


Figure 42

8 – 7b Company

- Provide metering transformers.
- Install all meters and connect metering transformers, and associated equipment for commercial and industrial applications.

Note: In most cases, metering transformers are required for service greater than 400 amperes.

8 – 8 CT Metering

- Provide lug for #12 wire. To be provided and terminated on the neutral bar.
- Minimum of 1" steel conduit between CT cabinets and meter box.
- CT's VT's shall be installed with self-tapping screws or drilled and tapped.

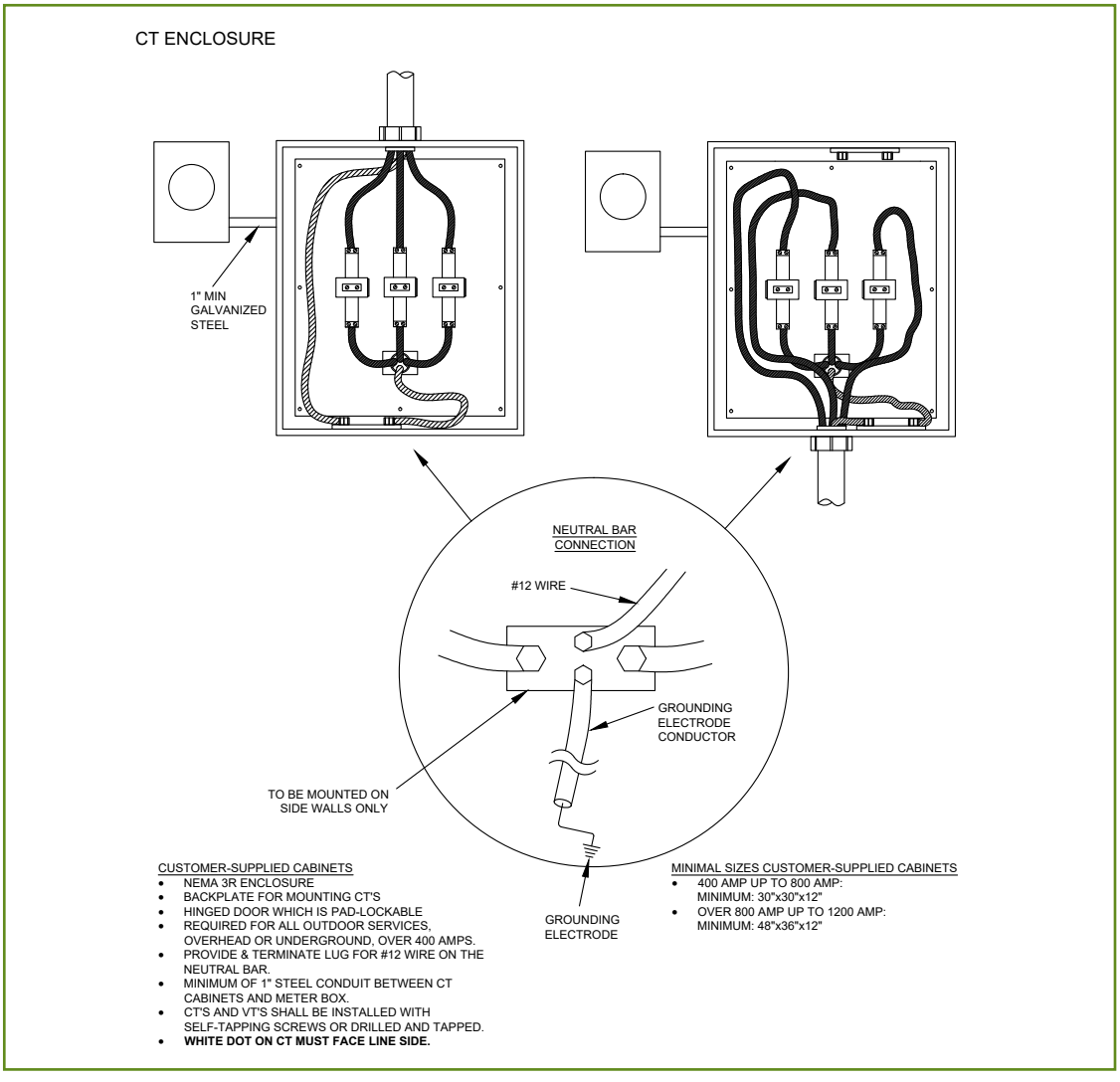


Figure 43

8 – 8a Customer/Contractor

- Contact the company to discuss the service equipment requirements and arrangements.
- Provide a drawing of the proposed installation before proceeding.
- Install 4 AWG copper grounding electrode conductor from CT meter socket (cabinet) and all three-phase self-contained meter sockets (box) to an exposed five-eighths-inch by eight-foot driven ground rod.
- Provide and install min. 1" galvanized conduit from the metering transformer enclosure to the meter location.
- Provide pull string for company to install metering wire.
- Consult with the company when metering transformers are to be mounted in a vault, metal-enclosed switchgear, or on a switchboard.
- Provide communication facilities, when required.

8 – 8b Company

- Permit no meters or instruments other than its own to be connected to its metering transformer secondary.
- Mount the meter on the outside of padmounted transformers (commercial and industrial services only), if applicable.
- Supply meter control wire.
- Determine the size of the conduit and the number and size of the metering wires.
- Approve the switchgear prior to customer purchase when the company's metering transformers are to be installed in metal-enclosed switchgear owned by the customer. In this case, the company may have the transformers installed by either the customer or the switchgear manufacturer.

8 – 9 Multiple Meter Installation

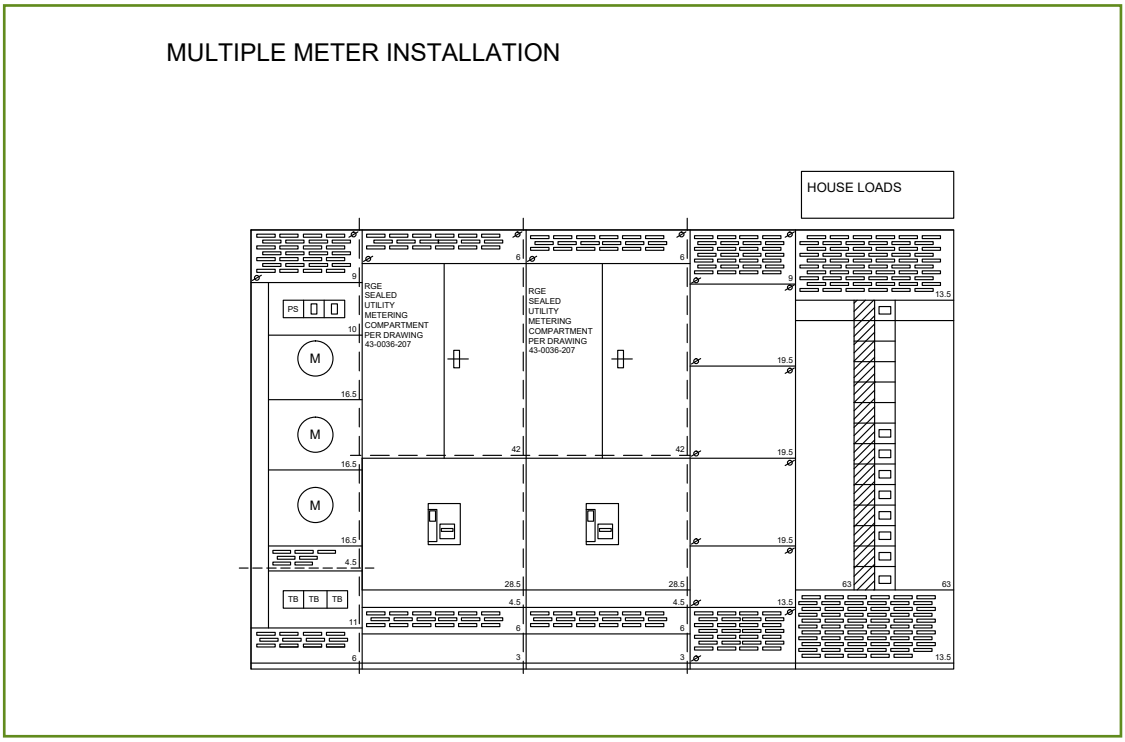


Figure 44

At locations where it is necessary to install four or more meters adjacent to each other, the meters may be installed in a room provided for this purpose.

Meters for all customers in multiple-occupancy buildings must be grouped in a single location and there must be adequate workspace clearance (a minimum of four feet).

All gear **shall be** approved by the Meter Department. Switch gear requiring CT/VTs shall have lockable breakers.

8 – 9a Customer/Contractor

- Ensure that all multiple meter installation of customer-supplied, stacked, or modular metering complies to the latest revision of ANSI/UL 414, ANSI C12.7, NEMA 250, and carries the UL Label. Also, they must be of ringless design and have a sealing mechanism which allows the cover to be sealed. Residential applications must have horn bypass. Three-phase and commercial applications must have lever bypass.

  In multi-occupancy buildings of three or more stories, the customer may NOT install unmetered conductors to a company-approved meter location on alternate floors. The installation must comply with the current requirements of the NEC, and other applicable codes. Disconnecting devices must be permanently marked to designate the floor levels con-trolled and located at the point of service entrance. The company is not responsible for the voltage level beyond the service entrance.
  The company assigns the labeling (suffix) for markings. No meter will be installed by the company in those cases where the customer has not physically labeled the meter box (meter socket enclosures). For residential dwelling units, the meter supplies service to that dwelling unit only and must be properly identified.

8 – 10 Meter Pedestal

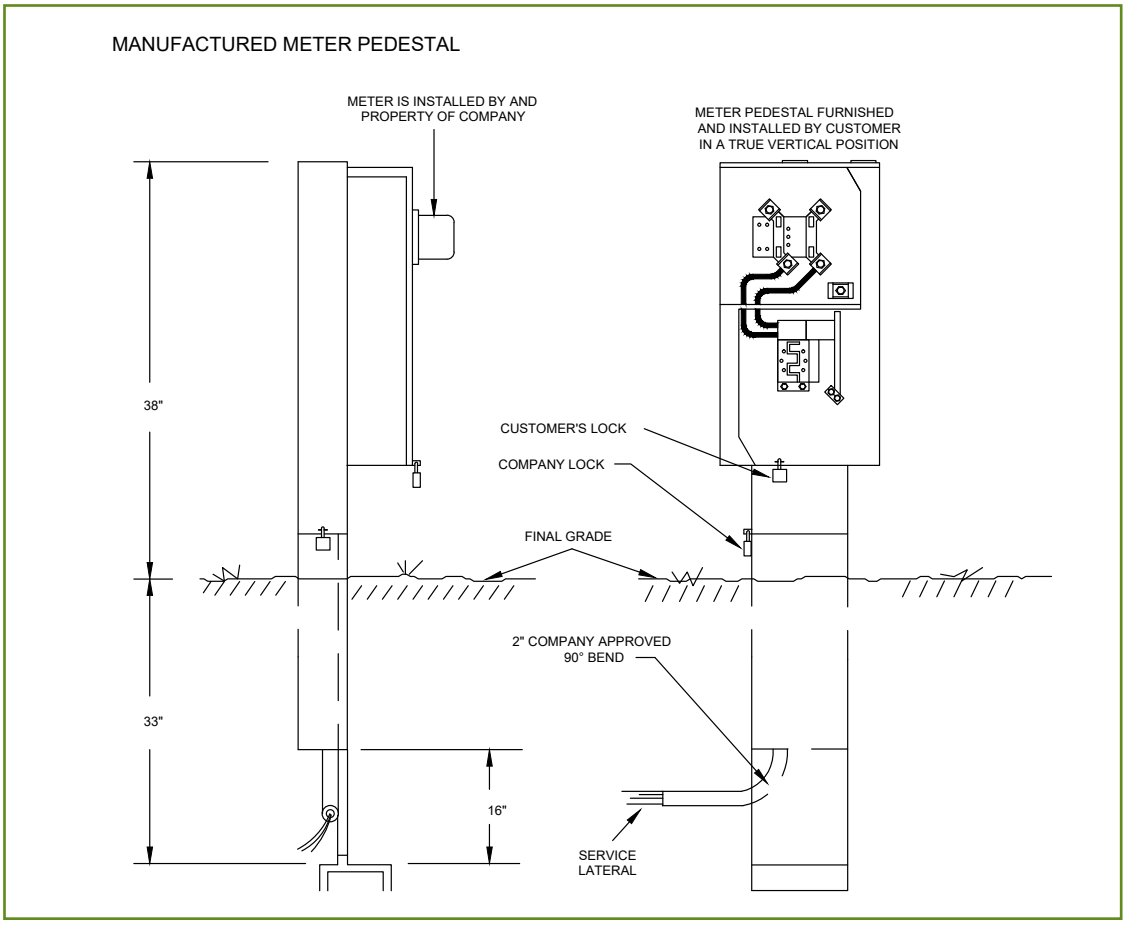


Figure 45

8 – 11 Wooden Type Pedestal

The customer provides and installs prewired combination metering and service equipment pedestals for underground service to mobile homes. All pedestals must conform to the latest revision of ANSI/UL 414, ANSI C 12.7, NEMA 250 and carry the UL label. They must be of ringless design with horn bypass and have a sealing mechanism which allows the cover to be sealed.

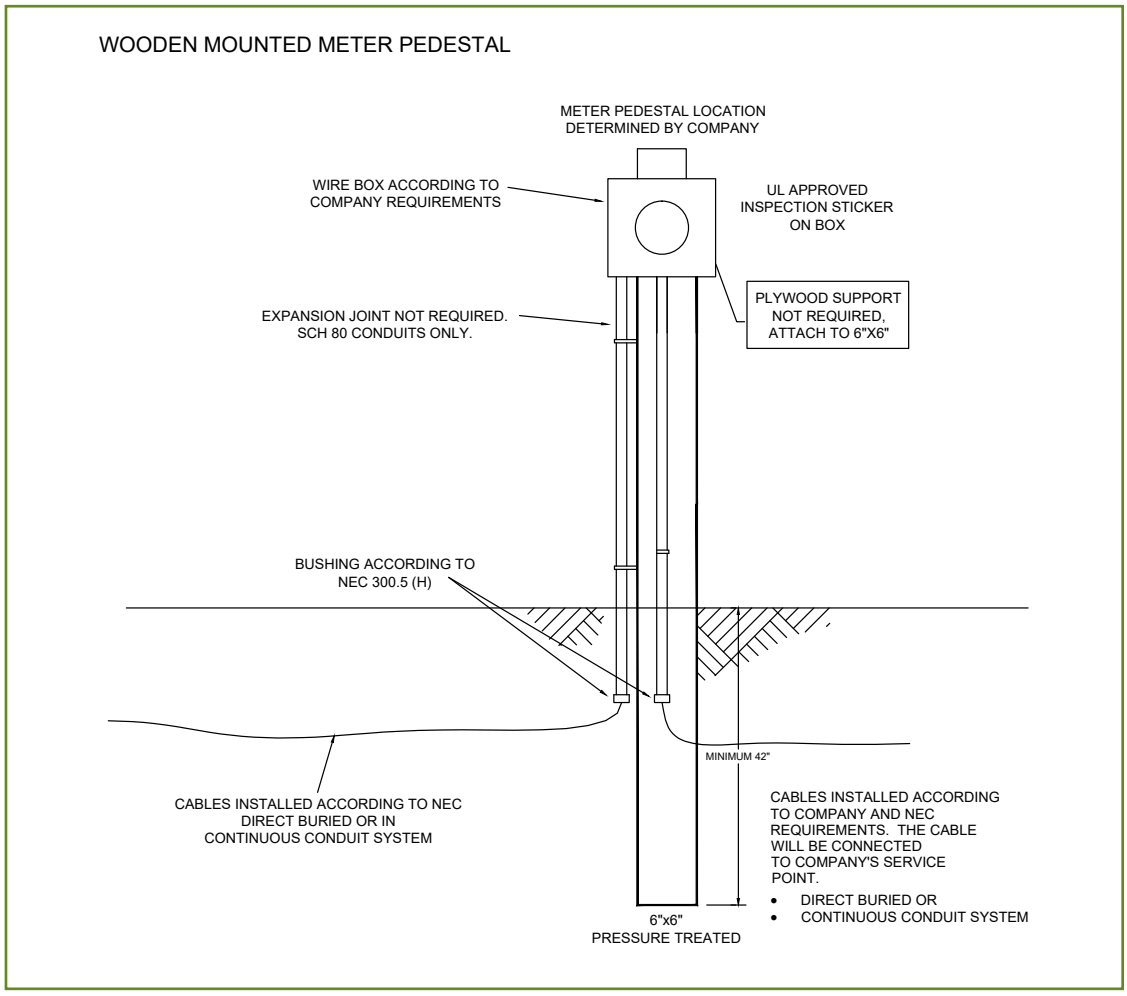


Figure 46

8 – 12 Special Equipment

The customer must pay the cost of the equipment and its installation when special and/or additional equipment is requested to furnish pulses in conjunction with demand-limiting control devices. The company assumes no responsibility for problems caused by the malfunction of this equipment.

8 – 13 Metering Wiring

For overhead services, the preferred entry and exit wiring method of meter boxes is through the top and out the bottom.

Underground must be in and out of the bottom of the meter box; both entrance phase conductors must be looped and enter at the top of the line side lugs.

Approved antioxidant compound must be used.

8 – 14 Relocation

If changes are made by the customer making the existing meter or service equipment unsafe or inaccessible, the customer must make the changes and absorb the expense to correct this condition.

8 – 15 Unauthorized Use

The breaking of seals, tampering with meters, or unmetered wiring is prohibited by *New York State Penal Laws,* and violators are subject to criminal penalties.

SECTION 9 Motors and Controllers

9 – 1 Motors and Controllers

9 – 1a Customer/Contractor

- Consult with the company concerning the characteristics of the service to which the motor will be connected to ensure correct application (phase and voltage) of the motor to be used. Direct inquiries to the company key account manager.

- Advise company key account manager before installing any single-phase motor rated 3 HP (equivalent 25,000 BTUH) or larger, or any three-phase motor rated 10 HP (equivalent 75,000 BTUH) or larger. Information required includes the rated voltage, full load and locked current, frequency of starting, the operating characteristics of the driven machine, and if the load fluctuates rapidly, such as in a stone crusher, sawmill, etc. The locked rotor current must be supplied by the manufacturer or computed from the appropriate table in the NEC.

9 – 2 Single-Phase Motors

Single-phase motors rated smaller than three-quarters HP may be connected for operation at 120 volts. Single-phase motors rated three-quarters HP and larger must be connected for operation at 208 volts or 240 volts. Single-phase air conditioning or heat pump compressors must be equipped with supplemental starting components.

9 – 3 Three-Phase Motors

Generally, motors rated larger than 5 HP are supplied from a three-phase service. The company does not, however, guarantee that three-phase service will be available whenever a customer installs a motor rated larger than 5 HP or an air conditioner or heat pump rated larger than 40,000 BTUH.

9 – 4 Motor Protection

9 – 4a Customer/Contractor

- Protect all motors against operation at any ampere/voltage level that exceeds their rating, including overloads caused by low-volt-age conditions.

- Protect three-phase motors against the possibility of single-phase operation. Reverse-phase relays, together with circuit breakers or equivalent devices, should be used on all three-phase installations for elevators, cranes, and similar applications to protect the installation from phase reversal.

9 – 5 Motor Controllers

9 – 5b Company

- Recommend that motor controllers be arranged so that in the event of sustained interruption the motor will be disconnected from the line, unless it is equipped for automatic starting after such an interruption. Where continuous operation of motorized equipment is essential, motor controllers should be arranged to allow motors to operate through a transient no-voltage condition lasting for one-half second (30 cycles).

9 – 6 Motor Starting Requirements

The current inrush to a motor during its start may cause fluctuations in the supply voltage. Where this effect is pronounced, the customer or other customers served from the same system may observe a visual disturbance or lighting flicker. To ensure high-quality service to all customers, the company has established certain rules pertaining to the limitation of motor starting current. The current limitations at a given location are determined by the service capacity contracted for, the type of motor, frequency of starting, and locked rotor current at the rated voltage.

The following specific motor starting current limitations are the maximum permissible limits to the current drawn from the service during each step of a motor starting operation, based upon frequency of starts. When a group of motors is started simultane-ously, the allowable starting current applies to the total for the group and not to an individual motor of the group.

9 – 7 Single-Phase Motor Starting Current Limitations

The maximum starting currents permitted for single-phase motors rated in HP and for air conditioning or heat pump equipment rated in BTUH are:

Single-Phase Motors

Service Voltage	Maximum starting current/step Maximum four starts per hour	BTUH rating of air conditioner or heat pump
120v	50 Amp	10,000
208 or 240 v	60 Amp up to 2 HP	20,000
208 or 240v	80 Amp up to 3 HP	25,000
208 or 240v	120 Amp up to 5 HP	40,000

Three-Phase Motor Starting Current Limitations
The maximum starting currents permitted for three-phase motors rated in HP and for air conditioning or heat pump equipment rated in BTUH are:

Three-Phase Motors

Service Voltage	Maximum starting current/step Maximum four starts per hour	BTUH rating of air conditioner or heat pump
208 or 240 v	100 Amp up to 5HP	40,000
208 or 240 v	130 Amp up to 7 1/2 HP	50,000
208 or 240v	160 Amp up to 10 HP	75,000
480v	50 Amp up to 5 HP	40,000
480v	65 Amp up to 7 1/2 HP	50,000
480v	80 Amp up to 10 HP	75,000

9 – 8 Favorable Locations

There are certain locations on the company's system where starting currents or frequency of starts greater than specified may be permitted. The customer must contact the company key account manager for motors that exceed the above limits.

SECTION 10 Customer-Supplied Primary Conduit Systems and Company Transformer Installation

10 – 1 Installation

10 – 1a Customer/Contractor

- Ensure the safe, reliable installation of primary underground conduits. Own and maintain all primary conduits between the company's distribution tap and the transformer pad.

- Refrain from starting any work until a sketch is received from the company. The sketch will indicate the route of the primary conduit, manhole, handhole, and transformer pad and customer requirements for installation.

  Note: Customer's contractor must notify the company one week in advance of excavation of trench by calling the company for inspection scheduling. Failure to contact the company prior to excavation will result in scheduling delays, additional customer requirements, and possible charges.

10 – 1b Company

- Own and maintain all cable within the customer's primary conduit and the company's distribution tap and the transformer pad.

10 – 2 Primary Conduit System

10 – 2a Customer/Contractor

- Consult the company regarding the location, selection, and details of the installation prior to design and installation.

- Install one spare conduit that contains a fish line and is plugged at the pole.

- Install conduit at a minimum depth of 36 inches below final grade, unless otherwise noted or approved by the company.

10 – 2b Company

- Specify location, type, and size of primary conduits. Minimum 4 inches in diameter.

- Provide the customer with a design sketch, installation charges, customer requirements for installation, and information regarding Underground Primary Distribution.

SECTION 10 Customer-Supplied Primary Conduit Systems and Company Transformer Installation

10 – 3 Acceptable Material and Applications for Primary Conduits

Acceptable Material	Acceptable Applications
Galvanized rigid steel conduit	All locations and 90 degree bends With minimum 36 inch radius
Rigid non-metallic conduit encased	Conduit run
At transformer foundations	*
At manholes and handholes	*
Rigid non-metallic conduit, approved All locations for the purpose without concrete envelope or other covering	All locations
PVC Schedule 80	*With 40" minimum depth under pavement or grade
PVC Schedule 40-DB	*Grade
PVC Schedule 40-DB encased	*Pavement

** To be determined by the company's electrical engineer for application*

10 – 4 Padmounted Transformer

10 – 4a Customer/Contractor

- Obtain any permits or easements.
- Provide property on which to construct the transformer foundation. The distance between a building wall and the transformer must meet company specifications. Separation between gas meter set and the transformer must be at least 15 feet.
- Provide sufficient unobstructed space suitable for operation and maintenance of this equipment.
- Maintain a minimum 12-foot clearance in front of transformer doors and a minimum of 5-foot clearance on the sides and back of transformer. Company engineering specifies transformer protection.
- Ensure transformer site is accessible at all times to company trucks equipped for the installation and removal of heavy transformers. Transformer sites in grass areas require a permanent, driveable base under the grass. The company is not responsible for any lawn restoration in cases where the transformer cannot be accessed by truck from a paved area.
- Maintain a minimum four-foot clearance in front of meter, if metering is installed on the transformer.

- Install, own, and maintain the transformer pad foundation in accordance with company specifications.
- Ground in accordance with company and NEC specifications.
- Install and maintain service laterals in accordance with the NEC and company specifications.
- Ensure cable is insulated stranded cable, terminated at the transformer end with Burndy Type YA (or approved equivalent) compression-type lugs. These lugs must have a two-hole NEMA drilled tongue and a long shank for a minimum of two compression indents, one-and-three-quarters inch in width.
- Ensure that the customer's electrician terminates the lugs on the de-energized transformer.

  Note: If the existing padmounted transformer with multiple customers is tapped off the transformer, the customer/property owner must make shutdown arrangements with all affected customers supplied from the transformer and supply company-specified lugs. The company will terminate the service.

10 – 4b Company

- Explain to the customer that the type of transformer installation depends upon specific conditions. Explain those conditions for the customer's situation.
- Specify transformer protection.
- Terminate on the transformer's two-hole spade terminals.

SECTION 11 Mobile Homes

11 – 1 General

The requirements for electric service and meters for mobile homes receive special consideration, in addition to applicable requirements in Section 4. Refer to Single-Phase Meter Box section.

11 – 2 Service

11 – 2a Customer/Contractor

- Consult with the company regarding each installation and consult with the company regarding the acceptable types of equipment.
- Ensure that the service entrance conductor has a minimum current rating of 100 amperes for a single meter position. Installations of two or more meters must have a current rating in accordance with the NEC.
- Provide adequate support for attachment of the service lateral. Do not attach the service lateral or meter directly to mobile homes, under any conditions.

11 – 3 Underground

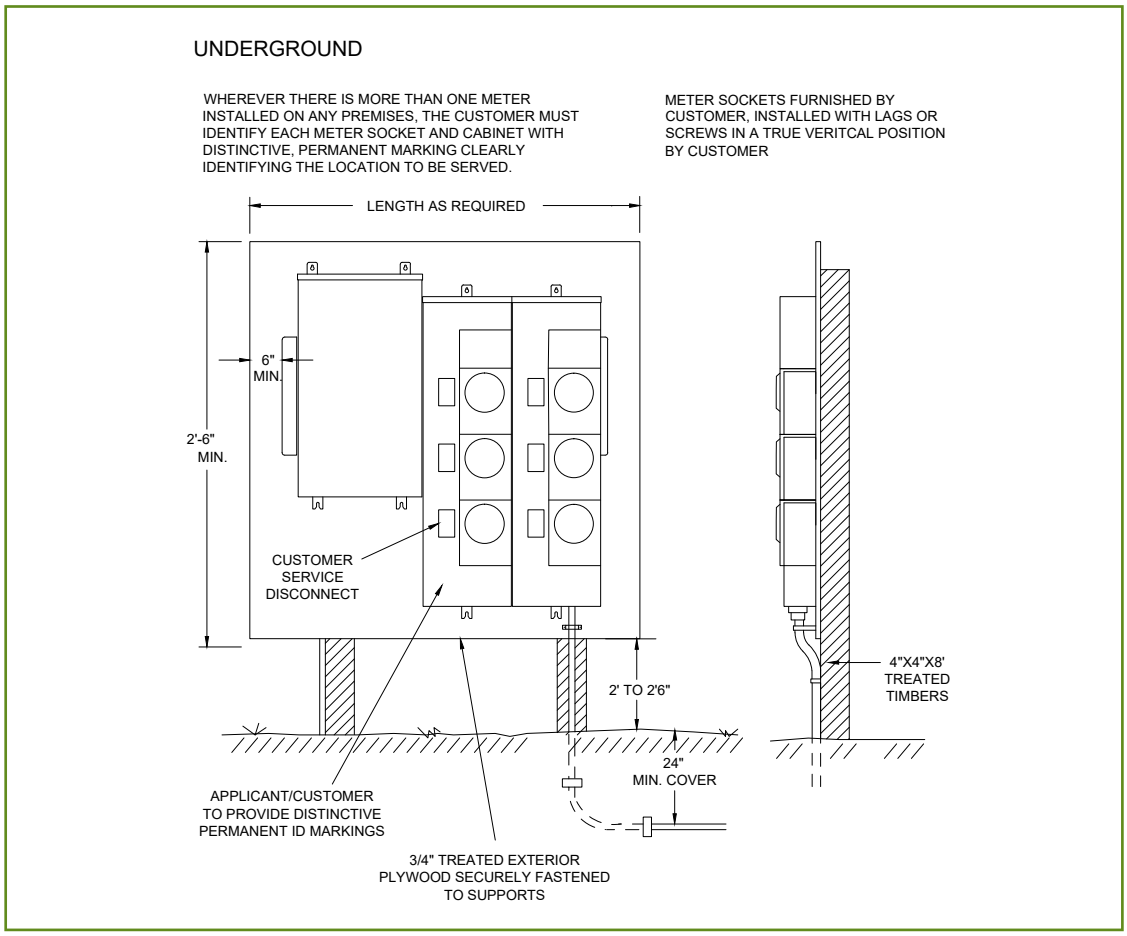


Figure 47

11 – 4 Overhead

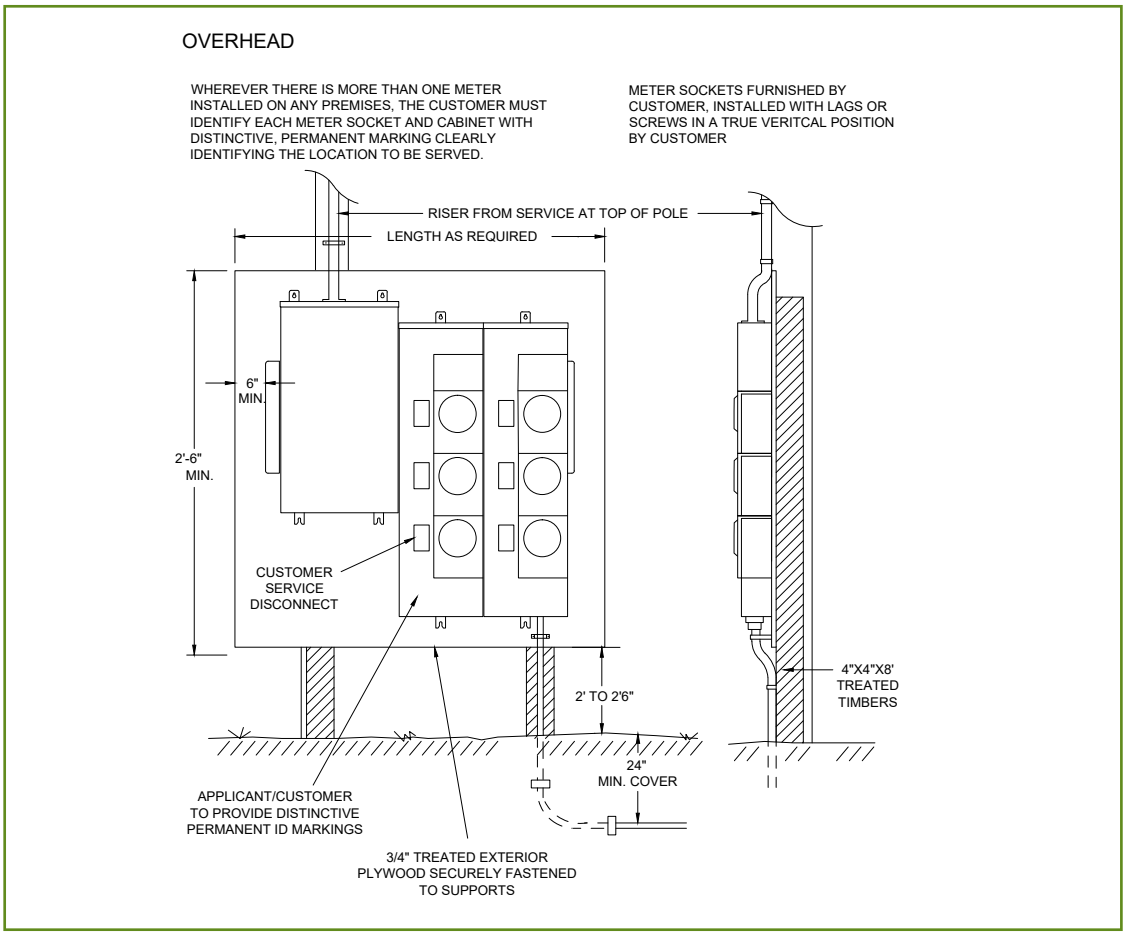


Figure 48

SECTION 12 Disturbances

12 – 1 General Information

The operation of large flashing signs, welders, arc furnaces, dielectric and induction heaters, inverters, variable voltage and frequency devices, radio and television transmitters, X-ray equipment, reciprocation compressors, and similar apparatus having intermittent flow of large current sometimes interferes with other users of the electric service. The customer must consult the company in each case before planning to use such equipment so that the character of electric service that will be supplied, the corrective equipment needed, and other special precautions that must be taken will be mutually known. The company reserves the right to discontinue service where equipment used by the customer results in objectionable effects.

12 – 2 Customer-Owned Electric Sources and Standby Generators

These items can sometimes cause disturbances to other customers. The customer must consult with the company before installation (see Section 14 of this booklet).

12 – 3 Carrier Current Systems

Where building wiring is used for a carrier current system for communication, remote control, signaling, etc., the customer must install suitable filter equipment to prevent any carrier current interface from entering the company's lines (service facilities).

12 – 4 Harmonics

Certain devices installed by the customer such as SCR controllers, large rectifiers, inverters, variable voltage and frequency devices, etc., may cause harmonic waveform distortion. Harmonic distortion must be in compliance with ANSI standards. Devices installed by the customer must not injuriously affect the company's equipment or its service to others.

The company will endeavor to maintain reasonable limits on the harmonic distortion levels present on its system through proper design and application of related equipment, yet the company cannot guarantee an essentially distortion-free waveform. Those customers whose particular service requirements necessitate such a waveform are encouraged to install, own, and maintain signal conditioning equipment.

SECTION 13 Special Provisions and Equipment

13 – 1 Customer-Installed Capacitors

Customers installing capacitors to improve the power factor of their load must consult their company key account manager for advice regarding supply system characteristics and essential coordination details.

13 – 2 Electric Fences

Due to the problems involved in the operation of electric fences, the company urges extreme care in selection of the electric fence system and close adherence to the standards for electric fence controllers (ANSI/UL 69). A direct connection to a fence, or a connection through resistance, reactance, or lamp bulb without an approved controller is not permitted. The controller, commonly called a fence charger, is required to regulate the amount and timing of the current through the wire. The fence charger and other equipment used must carry the label of the Underwriter's Laboratories (UL).

13 – 3 Computers, Solid-State Devices, or Other Voltage-Sensitive Equipment

The company will endeavor to supply voltage within an approximate 5.0% tolerance, but will not be responsible for damage to equipment or loss of data due to outages or voltage transients that exceed these limits. It is the customer's responsibility to provide and maintain protective interface equipment. Contact the company for further guidance.

13 – 4 Transient Surge Protectors

Transient surge protectors are available through distributors to help protect particularly sensitive customer equipment from low-energy transient surges.

13 – 5 Lightning or Surge Protection Systems

The company recommends the use of secondary surge arresters for protection of customer's equipment, where such additional protection is desired. Arresters must be connected on the load side of the main disconnect, not at the weatherhead.

Lightning rod systems, if desired, should be installed according to NFPA 780 *Standard for the Installation of Lightning Protection Systems.* A bond between the lightning rod system down ground and the service neutral should not be installed. Refer to NEC for spacing requirements. Spacing should be so arranged that the meter enclosure is not bonded to the lightning rod system down ground conductors.

SECTION 14 Customer-Owned Electric Sources and Standby Generators

14 – 1 General Information

Installations of customer's generating equipment must adhere to the fundamental rules for safeguarding all personnel and the company's equipment. The equipment must operate isolated from the company's electric system through a double-pole, double-throw "Break before make" switch, whether automatic or manual. Installations must meet the National Electrical Code and be approved by the company. Under no circumstances will the company allow a customer to add equipment to the electric meter or inside the electric meter enclosure. This includes a meter socket mounted adapter designed to connect a generator. Consult company prior to installation of the generator to any circuit that is, or can be, supplied from the company's distribution system. This is to ensure against any unanticipated backfeed of electricity into the company's system. In addition, the company will ensure that the existing metering and electric service equipment is adequate for this upgrade. The company reserves the right to discontinue service where generation equipment used by the customer results in objectionable effects to the system now or in the future.

14 – 2 Temporary Emergency Generator Connections

May be installed if a generator connection is made on the load side of the main disconnect and the main disconnect switch is in the "Open," "Break Before Make" position, and tagged. Tag must state "Do Not Operate." When power is restored, the customer must leave the main disconnect "Open" prior to removing the generator tap. The company's meter must not be accessed.

14 – 3 Portable Standby Generators

Portable standby generation must not be connected to building wiring without a company-approved isolating double-pole, double-throw switch and an inspection by an authority having jurisdiction.

14 – 4 Generation Requiring a Meter Exchange

Installations where the customer wishes to sell generated power back to the grid such as installations of solar panels will require that the company replace the existing customer's meter with a new meter that can record electric usage in two directions. The company requires that the meter enclosure and additional connected service equipment meets current applicable company, local and NEC specifications and codes before the meter will be replaced. If the company determines that the meter enclosure and related equipment is unsafe or in disrepair, it will be required to be repaired or replaced to those current applicable standards before a new meter is installed.

14 – 5 Separately Derived System

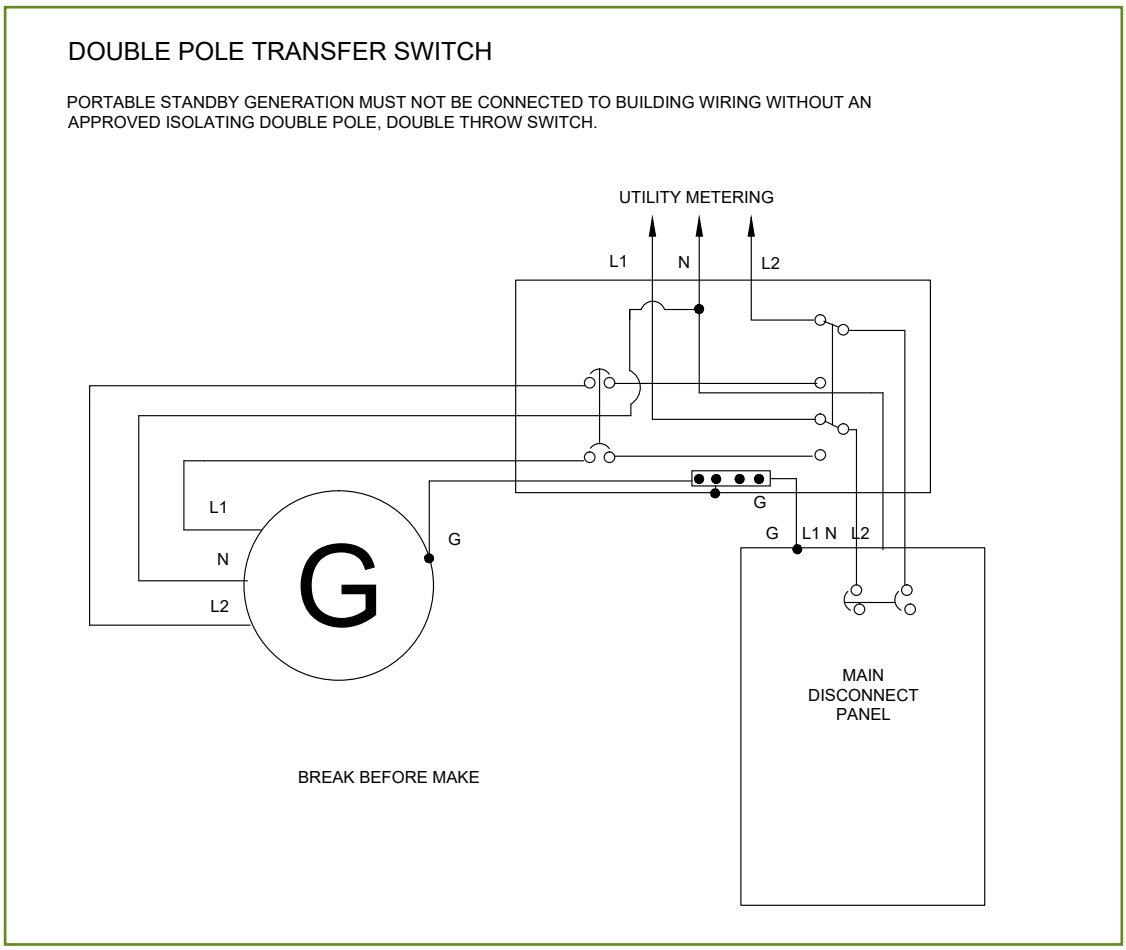


Figure 49

14 – 6 Transfer Systems

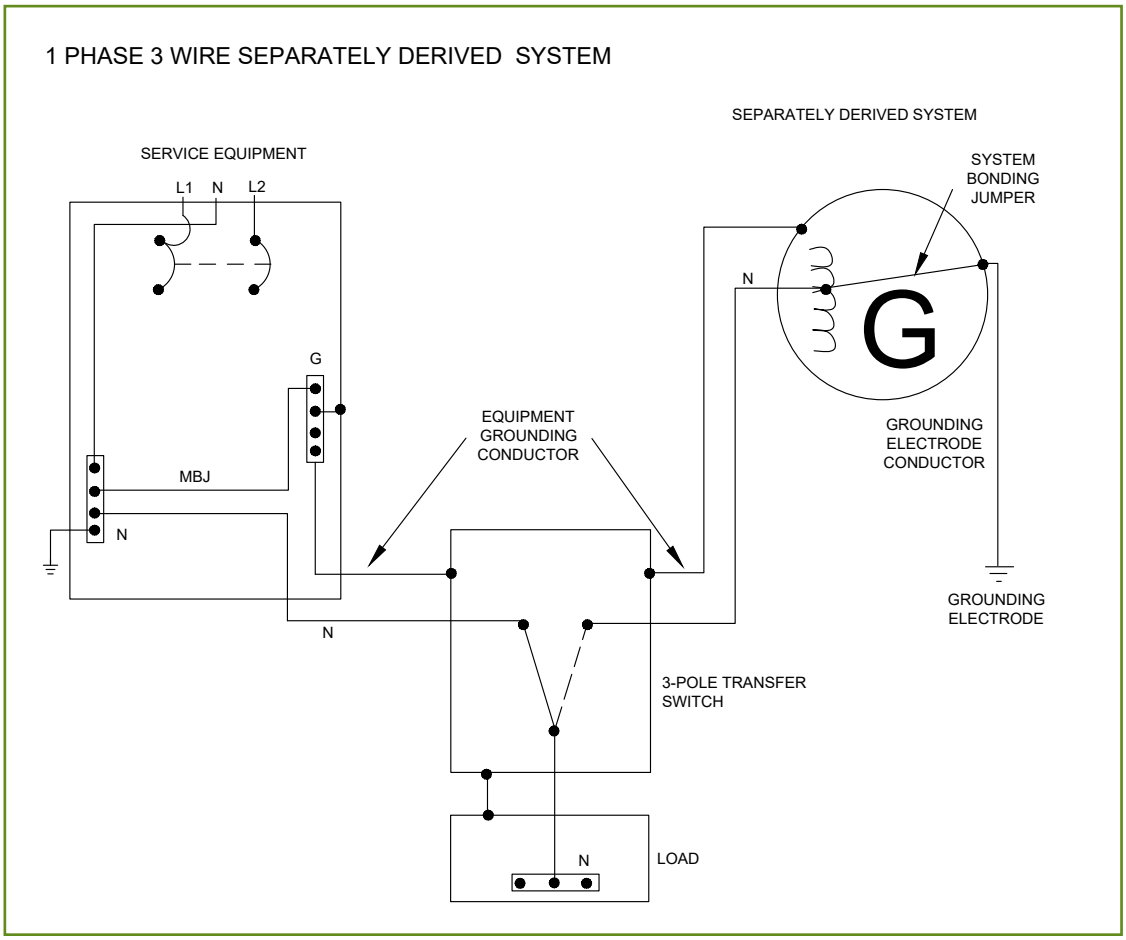


Figure 50

Service Equipment Rated Transfer
The company permits transfer switches listed and labeled "Suitable for Use as Service Equipment" for use as main service equipment upon prior approval. All other transfer switches must be connected on the load side of the Main Disconnect Panel.

14 – 7 Open-Transition Transfer and Natural Gas-Fired Generator Procedures

Note: The company's operating system has pockets of low pressure. If your service is being fed from a low-pressure system, there will **not** be a regulator on your meter assembly. If you do not have a regulator, the company cannot supply your service with elevated pressure. You will need to look for an alternative source of fuel.

Procedures for Single-Family Dwelling

- The company's current delivery pressure for a residential service is 6 inches water column. If the pressure requirement for your generator exceeds 6 inches water column, you will need to request elevated pressure from the company.
- Complete the *Elevated Pressure Commitment Letter and the Gas Appliance Inventory* sheet.
- Return these forms to the company.
- The Gas Appliance Inventory sheet will determine if a larger meter is needed. A new meter is required if the total connected load, including the generator, exceeds 350,000 BTUs. All charges for elevated pressure and/or a new meter must be paid when submitting the two required forms.
- Upon return of the completed forms and your payment, the company will verify if the new load is adequate for the existing service (from the Gas Appliance Inventory sheet). If not, the company will work with you on other options.
- A 5-foot clearance must be maintained around the gas meter.
- The fuel line to the generator as well as the in-line, lock-up style secondary regulator must be installed before the pressure will be elevated. (The secondary regulator installed by your contractor protects your existing gas appliances.) Size the secondary regulator for 11-inch outlet down to 6-inch inlet.
- An electrical inspection completed by an authority having jurisdiction must be faxed to the company by that authority.
- When the faxed inspection report is received, the company will call you to schedule an appointment to increase the pressure and (if required) change the meter.
- If the company cannot change the regulator during the scheduled appointment (due to the improper installation of the generator or secondary regulator, etc.), a return trip charge will be assessed.
- If you do not need elevated pressure for your generator, these two forms must nevertheless be completed and returned to the company. The company must review the size and the length of the service feeding your home to ensure adequate pressure and volume are available.

Procedures for Townhouse/Condominium or Other Multi-Family Dwelling

- Call the company before purchasing a generator. The company will review the design of the gas service. There may be a problem for these types of services and the generator may not be able to be installed using natural gas. Each request will be handled on a case-by-case basis.

14 – 8 Closed-Transition and Auto Transfer Systems

Closed-transition and automatic transfer systems require specification submittal and must be approved by the company prior to installation.

14 – 9 Parallel Generation

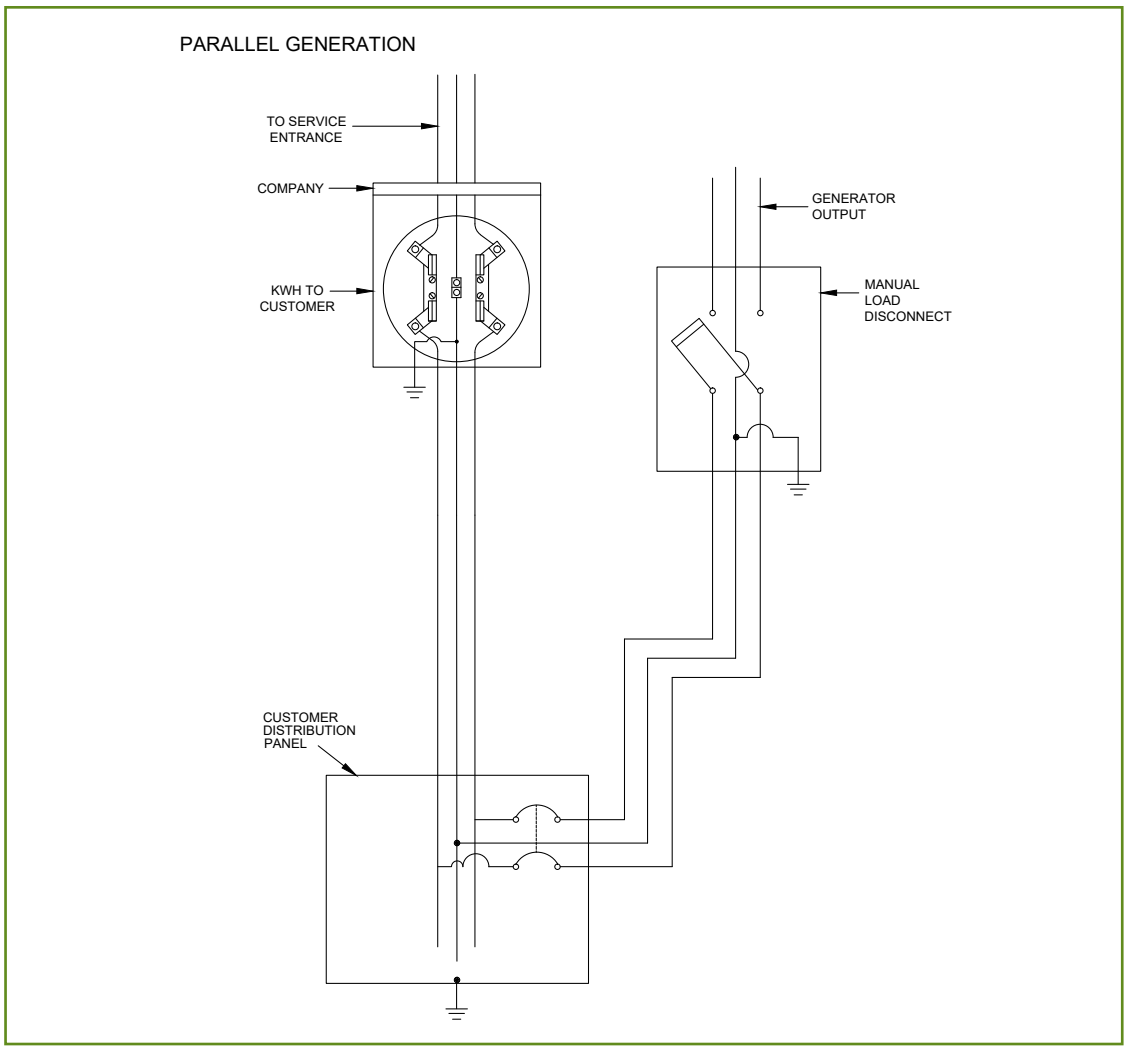


Figure 51

Generating equipment that operates in parallel with the compa-ny's electric system must comply with the *Requirements for Independent Power producers of Electricity (86-01)* and the *Distributed Generation Interconnection Requirements* listed in the company *Tariff Schedules for Electric Service, PSC No. 19.*

An application for parallel interconnection as well as the require-ments may be obtained by calling the manager of Non Utility Generator (NUG) Interconnections. Call the company for the appropriate name and number.

The company strongly recommends that the customer consult with the company prior to purchase of equipment.

SECTION 15 Fault Current

15 – 1 General Information

The following tables provide the maximum fault currents available for common transformer sizes at RG&E. The values shown are approximations calculated on an infinite bus source basis and have been rounded to whole numbers. The calculation eliminates all source impedances and deals only with the distribution transformer serving the load. If exact fault current levels are needed, the company must be consulted to review and calculate on a case-by-case basis.

15 – 2 Network Services

The short circuit rating for the 120/208 volt network grid is 100,000 amperes. Refer to Section 6-Network Services for additional info.

15 – 3 Single Overhead and Padmount

1 Phase Transformers KVA	Max Available Fault Current 120/240v
10	4200
15	6300
25	10500
50	13900
75	20900
100	23200
167	34800

15 – 4 Three Phase Overhead

3 Phase Bank KVA	Max Available Fault Current	
	480Y/277v	208Y/120v
75	9100	20900
150	12100	27800
300	18100	41700
500	30100	69400

15 – 5 Three Phase Padmount

3 Phase Bank KVA	Max Available Fault Current	
	480Y/277v	208Y/120v
75	9100	20900
150	15100	34700
300	30100	69400
500	40100	92600
750	18100	41700
1000	24100	-
1500	36100	-
2500	60200	-

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