

**REQUIREMENTS  
*for*  
ELECTRIC SERVICE  
*and*  
METER INSTALLATIONS**



**Florida Service Area**

**REVISED 2012**  
**Amended (7/2013)**

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The following policies and rules were the company requirements at the date of publication and are subject to change. [Duke Energy Florida, Inc.](#) personnel should be contacted for the latest requirements in effect. For questions or concerns regarding the contents of this book, feel free to contact any committee member listed below.

The committee that made the changes contained in this edition was comprised of members from many technical disciplines and most geographic divisions of [Duke Energy Florida, Inc.](#). In addition, members representing the electrical contractor community. Changes were made only after a subject had been considered from all points of view. We hope this edition will make it easier for you to do your job well.

**Requirements for Electric Service and Meter Installation Book**  
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These standards as set forth shall not be construed as authority to violate, cancel, alter or set aside the laws and or codes of the State of Florida, or of any county, municipality or other governing bodies such as the Florida Building Code, the National Electrical Code or the National Electrical Safety Code. In the event that guidelines and requirements for electric service, contained herein, appear to conflict with provisions of any technical code, such conflict should be brought to the attention of **Duke Energy Florida, Inc.**, before proceeding to comply with these guidelines and requirements.

- To Initiate Application for New Service or To Request Alteration or Addition to Existing Service.
- To Determine Availability and Location of Proposed Service
- To Schedule a Prearranged Outage.



CALL

1-800-700-8744

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To review the latest updates on **Duke Energy Florida, Inc.**, Approved Meter Enclosure List, contact your local **Duke Energy Florida, Inc.**, Representative or visit our website.

To access the book online, visit our website at:

<https://www.progress-energy.com/florida/business/builders-contractors/installations.page?>

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Call Before You Dig  
Sunshine One-Call  
**811**  
(72 Hours in Advance)



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Significant changes in **Sections I – VII** in the **2012** Edition of the Requirements for Electric Service and Meter Installations (as compared with the **2007** Edition) are designated by blue lettering. Blue lettering in the Figures do not indicate changes.

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# SECTION I

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## INTRODUCTION

Duke Energy Florida, Inc. constantly strives to maintain a high standard of service to all customers. This book has been prepared for use by customers, architects, engineers, electrical contractors, company employees and local inspecting authorities so they may receive full benefit from our service. We believe you will find it helpful when planning new electrical installations, revamping old ones or adding additional equipment. Copies are available online at [www.duke-energy.com](http://www.duke-energy.com).

All holders of **Requirements for Electric Service and Meter Installations** books are encouraged to submit proposals to aid in future revisions. Please submit proposals as follows:

1. Give section, paragraph and page number to which proposal pertains.
2. Submit proposal in writing or call committee members. Include details, sketches, drawings and all pertinent supporting information.
3. Mail to: **Duke Energy Florida, Inc**  
2401 25<sup>th</sup> Street North  
St. Petersburg, Florida 33713

The impression generally prevails that compliance with the "National Electrical Code," or the various electrical ordinances guarantees to the customer a wiring installation complete and adequate for the full use of electric service now and in the future. This is not necessarily the case. That code and those ordinances are designed to provide the minimum requirements considered necessary for safety. The code itself states, "Compliance therewith and proper maintenance shall result in an installation essentially free from hazard, but not necessarily efficient, convenient or adequate for good service or future expansion of electrical use." Careful design and installation often result in a wiring system that exceeds code requirements. For connection or reconnection of service, both the Authority Having Jurisdiction and the Company have the right to determine compliance for service.

Except for the installation and maintenance of its own property, [Duke Energy Florida, Inc.](#) does not install or repair wiring on the customer's premises and, therefore, is not responsible for the voltage beyond the Point of Delivery and does not assume any responsibility for, or liability arising because of the condition of wires or apparatuses on the premises of any customer beyond this point.

Your cooperation shall be greatly appreciated and will enable you to receive prompt and satisfactory service.

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## SECTION II

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### GENERAL INFORMATION

#### A. DEFINITIONS

The following definitions shall apply for terms used in this book.

**ANSI** – American National Standards Institute.

**Authority Having Jurisdiction** – (See Inspector, Inspection Authority).

**Available Fault Current** – The maximum current that would flow due to a direct short from one conductor to ground or between conductors at the point of calculation.

**Cogeneration** – See Interconnection.

**Company** – [Duke Energy Florida, Inc.](#)

**Contribution-in-Aid of Construction** – The added cost paid by a Customer or developer to have the Company install service facilities costing more than that normally recovered through the monthly energy and Demand charges.

**Customer** – User of the Company's electric service or his authorized representative (architect, engineer, licensed electrical contractors, etc.)

**Demand** – The average rate at which electric energy in KW, KVA or KVAR is consumed per time interval, typically 30 minutes.

**Demand Ampere** – Average current flowing during the peak Demand interval.

**Emergency and Standby Generators** – Generators that normally operate only when the Company's electric service is unavailable and which are connected in such a way that no Interconnection can exist.

**Energy Management** – A program whereby the Company remotely controls the operating schedule of various household or commercial appliances during peak or emergency periods.

**FEMA** – Federal Emergency Management Agency.

**FMG** – Florida Meter Group

**FPSC** – Florida Public Service Commission.

**High Leg** – The conductor in a three-phase delta secondary connection that has a higher voltage-to-ground potential than the other conductors.

**IEEE** – Institute of Electrical and Electronic Engineers, Inc.

**Inspector or Inspection Authority** – A person or agency authorized by a governmental body to inspect and approve electrical installations.

**Instrument Transformer** – Current Transformer (CT) or Potential Transformer (PT) used to obtain current or voltage levels required for metering circuits.

**Interconnection – Cogeneration and Small Power Producers** - An electric service where cogenerators and small power producers operate in parallel with the Company's electric system. Energy may flow in either direction through an Interconnection.

**Labeled** – Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

**Listed** – Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that the equipment, material, or services either meets appropriate designated standards or has been tested and found suitable for a specified purpose.

**MCOV** – Maximum Continuous Over Voltage

**MOV** – Metal Oxide Varistor

**Meter Enclosure** – A device which houses a Meter Socket and line and load terminals.

**Meter Socket** – A device which provides support and means of electrical connection to a watthour meter.

**NRTL** – Nationally Recognized Testing Laboratories.

**National Electrical Code (N.E.C.)** – A code sponsored by the National Fire Protection Association under the auspices of the American National Standards Institute for the purpose of safeguarding persons and property from hazards arising from the use of electricity.

**National Electrical Safety Code (N.E.S.C.)** – A code sponsored by the Institute of Electrical and Electronics Engineers, Inc. under the auspices of the American National Standards Institute for the purpose of the practical safeguarding of persons during the installation, operation or maintenance of electric supply and communication lines and associated equipment.

**Network** – Secondary distribution system where multiple transformer secondaries are connected to a common 120/208 volt, 4-wire, 3-phase secondary buss serving a specified area.

**Non-Ferrous** – Non Iron, i.e. aluminum, brass, copper, stainless steel, etc.

**Photovoltaic** - Photovoltaic's are best known as a method for generating electric power by using solar cells to convert energy from the sun into electricity. Solar cells produce direct current electricity from sun light, which can be used to power equipment or to recharge a battery.

**Point of Delivery** – The point as designated by the Company, where the Company's overhead Service Drop, underground Service Lateral or transformer secondary bushings connect to the Customer's Service Entrance conductors.

**Service** – The supply by the Company of electricity to the Customer, including the readiness and availability of electrical energy at the Point of Delivery at the standard available voltage and frequency whether or not utilized by the Customer. [See Section III-D-3 for all Commercial Service.](#)

**Service Drop** – The overhead service conductors between the Company's secondary conductors and the Point of Delivery to the Customer's property.

**Service Entrance** – Customer-owned wire and enclosures, connecting the Customer's service equipment to the Company's Service Drop, Service Lateral, transformer bushings or other source of supply.

**Service Lateral** – The underground service conductors between the Company's secondary conductors or transformers, including any risers at a pole or other structure and the Point of Delivery.

**Standby Generation** – Demand control program based upon indirect (or direct) control of customer equipment.



**Tariffs** – The applicable rates and electric service rules and regulations under which all energy is delivered and all service is rendered by the Company, and which are approved by and/or on file with the Florida Public Service Commission.

**Temporary Service** – Service for construction, fairs, displays, exhibits and similar temporary purposes where Company has a source of supply readily available.

**TUG** – Temporary Underground Service

## B. AVAILABILITY AND LOCATION OF SERVICE

1. Information concerning the availability of service for a desired location shall be provided by the Company. **The Company, in all cases, shall designate the Point of Delivery.** The Company shall make extensions to its existing facilities when required, provided the revenues to be derived shall be sufficient to afford a fair and reasonable return on the cost of making such extensions.

These extensions shall be to the point which allows the Company to provide service in the most economical and practical means. Should additional facilities be requested by the Customer, additional fees shall be required to cover added cost. The Company may, under the Tariff, require from Customers additional fees, minimum guarantees, easements, service guarantees or other arrangements whereby the Company shall be assured a fair and reasonable return on the cost of providing service.

2. In order to insure that the service connection shall be made promptly, and that Company equipment has adequate capacity to provide satisfactory service to the Customer, cooperation between the Customer and the Company is necessary. **Before construction is started, the Customer shall request the Company to designate a Point of Delivery** and submit appropriate load data to the Company. The load data should include the anticipated demand or the type and number of electrical appliances to be used and when possible, a set of building plans. **The request for Point of Delivery location is not an application for service to the permanent building.**
3. It is imperative that the Company and Customer be in agreement on the planned location of all service related equipment before construction is started. The Company shall have the final authority to determine the location. This equipment includes meters, risers, pedestals, pull boxes, CT cabinets, transformers, etc.

## C. APPLICATION FOR SERVICE

1. In order to obtain permanent Service at the desired time, an application for permanent Service shall be made by the Customer or owner during construction or as far in advance of the occupancy of the building as possible. Service contracts, where applicable, and/or deposits are required prior to service connection.
2. Application for Service shall include zip code number, street name and service address. **The assigned service address shall be clearly and permanently marked on a permanent structure not susceptible to relocation, and/or the building itself, that is visible from the front of the property before the meter and/or Service Drop is installed.** No meter shall be set unless the application for service address is the same as the permitted electrical address. Where multiple facilities are at the same address, each facility shall be separately marked per Section IV-A-4. Other information, to assist in locating the Customer's premises, shall be supplied. Wherever possible, the legal description of the property should be included. Under certain conditions, the Company may require application in writing.

## D. TYPE AND CHARACTER OF SERVICE

1. **IT IS ESSENTIAL THAT THE CUSTOMER CONSULT THE COMPANY (1-800-700-8744) REGARDING TYPE OF SERVICE WHICH CAN BE FURNISHED AT A PARTICULAR LOCATION BEFORE PROCEEDING WITH PURCHASE OF EQUIPMENT OR INSTALLATION OF WIRING.**
2. Service is provided with alternating current at a normal frequency of sixty (60) hertz (cycles per second).
3. The voltage and/or number of phases which shall be supplied shall depend on the type, size and location of the load, and existing Company facilities.

### a. **Voltage**

Standard voltages are 120/240, 120/208 and 277/480 (see **Figure 50**). Only one of these sets of voltages is normally available at any given location. If a voltage is requested other than that which is currently established at the desired location, the Customer may be charged a "Contribution-in-Aid of Construction" to cover the cost to supply the requested voltage.

b. **Phase**

Single phase, 3-wire service or 3-phase, 4-wire service shall be provided according to the following:

- (1) Customers located in predominantly residential areas shall normally be provided with only single phase 120/240 volt service. Three phase service to such Customers may be supplied only if a single motor of more than 5 HP or single heat pump/air conditioner of more than 5.6 tons is present, and the required Company facilities are readily accessible. The Customer may be charged a "Contribution-in-Aid of Construction" for 3-phase service.
  - (2) In multi-occupancy buildings or complexes served by 120/208 volt, 3-phase facilities, normal service to individual occupancies shall be 120/208 volt, single phase, 3-wire.
  - (3) Commercial/industrial Customers located in commercial/industrial areas shall be provided 3-phase service only if it is currently available at the location, or if loads meet the above size requirement, or if "special" 3-phase loads are involved as determined by the Company.
  - (4) If total 3-phase demand at a building is 25 KW or less, the normal service voltage shall be 120/240 volt, 3-phase, 4-wire.
  - (5) If 3-phase service is requested and the above conditions are not satisfied, the Customer may be charged a "Contribution-in-aid of Construction."
  - (6) The preferred method of rotation by the Company is clockwise.
4. The manner in which single phase load is connected by the Customer is critical with 3-phase service. On 120/208 volt or 277/480 volt "wye" 3-phase services, all single-phase loads should split evenly among the three phases. On 120/240 volt "delta" 3-phase services, all single phase load, both 120 volt and 240 volt, shall be connected only to the 120 volt-to-ground legs. **NO SINGLE-PHASE LOAD EITHER 120 VOLT OR 240 VOLT, SHALL BE CONNECTED TO THE "HIGH-LEG."** Connections made otherwise may result in an overload or single phase condition with the possibility of damage to the Customer's 3-phase equipment.

## **E. INSPECTION**

1. The Customer's wiring and electrical equipment shall be installed in accordance with the adopted edition of the "National Electrical Code" and local ordinances.
2. All wiring installations shall be inspected and approved by the Authority Having Jurisdiction as required by law. The Company can make connection only when requirements of this book have been met and the Company has been notified by the Authority Having Jurisdiction that the installation has been approved. If a safety inspection is required by the Authority Having Jurisdiction, it shall be done before connection or reconnection of service.
3. The Company shall make an inspection of the Customer's Service Entrance facilities only to check for compliance with the Company's requirements stated in this book. If it is found that the facilities are not in compliance with these requirements, the Company may refuse to connect the service. A reasonable effort shall be made to advise the Customer of any changes required by the Company.
4. The Company may refuse service to any new or altered installation, or disconnect service to any existing installation, which upon inspection, the Company or authorized inspecting authority considers unsafe. The Company may disconnect a service that shows physical evidence of tampering, hazardous condition, or current diversion as provided under State Statutes, Rules and Regulations of the Company, or the Florida Public Service Commission. The Company shall not be responsible in any way for any defect in the Customer's wiring or for damage resulting from such defects.
5. Temporary emergency restoration of service to an existing Customer shall be made in accordance with the Company's Rules and Regulations and the Authority Having Jurisdiction.

## F. ALTERATIONS AND ADDITIONS

1. **SERVICE CONNECTIONS, COMPANY-OWNED METERS OR METERING EQUIPMENT, BY LAW, SHALL NOT BE REMOVED OR RELOCATED EXCEPT BY EMPLOYEES OR DULY AUTHORIZED REPRESENTATIVES OF THE COMPANY AUTHORIZED TO DO SUCH WORK.**
2. Connection to the Customer's premises is made with facilities designed to properly supply adequate electric service for the Customer's operation, using information provided on the application for service. **Therefore, no additions of major load, or alterations of the Customer's installation should be made without first notifying the Company.** Failure to provide such notification may affect the quality and reliability of the Customer's own service and also that of other Customers supplied from the same facilities.
3. An application for changes in the service provided by the Company shall be made by the Customer in the same manner as application for new service.
4. When the Customer requests a change in the existing service characteristics, the requirements outlined in Section II-D (Type and Character of Service) shall apply.
5. When alterations require the relocation of Service Drop wires, meters or metering equipment, the Customer shall make appropriate advance arrangements with the Company for the accomplishment of such relocation. Relocation of service attachments shall be approved by the Company before the Customer commences work. When alterations have been satisfactorily completed by the Customer **and the necessary inspection approvals obtained**, the Company shall make the connections to provide service.
6. **EQUIPMENT REMOVAL**
  - a. The Company shall, upon notification from the Customer, remove equipment no longer necessary to provide service.
  - b. The Company may remove equipment no longer necessary to provide service upon notification to the owner.

7. When new risers are added at an existing overhead Point of Delivery, it is the responsibility of the Customer to connect the service conductors from the new risers to the conductors from the existing riser. The new service conductors shall not be connected directly to the Company's Service Drop. Arrangements should be made through the Company to have the service disconnected long enough to allow the Customer's electrician to make the required connections and receive inspection approvals. **Refer to Figure 51 for connection block details.**
8. Before a permit is obtained, it shall be the responsibility of the Customer or his agent to ascertain from the Company that the meter number and service address for which the permit is to be obtained are in agreement with the current records of the Company.

## **G. RIGHTS AND RESPONSIBILITIES**

The Company shall have the right to enter the premises of the Customer at all reasonable hours for the purpose of making such inspection of the Customer's installation as may be necessary for the proper application of the Company's rate schedules and rules and regulations; for installing, removing, testing or replacing its apparatuses or property; for reading meters; and for the entire removal of the Company's property in the event of termination of service to the Customer for any reason.

All property of the Company installed in or upon the Customer's premises used or useful in supplying service is placed there under the Customer's protection without charge to the Company. All reasonable care shall be exercised to prevent loss or damage to such property.

The Customer shall be held responsible for breaking the seals, tampering or interfering with the Company's meter(s) or other equipment installed on the Customer's premises. No one except authorized employees/agents of the Company shall be allowed to make any repairs or adjustments to any meter or other apparatus belonging to the Company.

## **H. ELECTRICAL CONTRACTOR SEALING POLICY**

When a licensed electrical contractor removes a Company seal, said contractor shall replace the seal with a tie wrap type with a tab displaying the contractor's name and telephone number and he shall notify the Company in a timely manner.

## **I. REFUSAL OR DISCONTINUANCE OF SERVICE BY THE COMPANY.**

Under Section 25-6.105 of the "Rules of the Florida Public Service Commission," the Company may refuse or discontinue service for certain reasons. Several of these reasons are listed below. The entire rule is available for inspection at Company offices.

1. Non-payment of bills for electric service.
2. Refusal or failure to make a deposit when requested.
3. Failure to rectify a deficiency or defect in the Customer's wiring or other facilities after receiving notice from the Company that such condition exists.
4. Unauthorized use of electric energy.
5. Operation of equipment which causes voltage flicker or objectionable service characteristics to other Customers.
6. Neglect or refusal to provide safe and reasonable access to the Company.
7. Without notice in the event of tampering with meters or other facilities furnished and owned by the Company.
8. Without notice in the event a hazardous condition is found by the Company.



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## SECTION III

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### SERVICES

#### A. GENERAL INFORMATION

1. Normally, there shall only be one service voltage available at a location, and only one Point of Delivery for each building.
2. **The Point of Delivery shall be designated by the Company.**
3. All Service Entrance facilities, including meter enclosures, shall be located in an exposed or readily accessible area.
4. Residential and commercial building Service Entrance conductors shall consist of a minimum of three (3) No. 6 copper or equivalent.
5. Aluminum conductors may be installed, provided the meter socket is of a type approved for use with aluminum conductors, and corrosion inhibiting compound recommended by the cable manufacturer is properly applied to the meter socket terminals by the electrical contractor. All neutrals shall be insulated.
6. When an existing Service Entrance using copper conductors is replaced by a Service Entrance using aluminum conductors, the existing meter socket, if not marked for use with either aluminum or copper conductors, shall be replaced with one approved for aluminum conductors.
7. Service Entrance conductors between the Company's source of supply and the Customer's service equipment should be as short as practical, and shall be enclosed in conduit or metallic tubing unless otherwise permitted by local code.
8. Where conduit or metallic tubing is used, fittings with removable covers should be avoided in the Service Entrance run if possible. If such fittings cannot be avoided, they shall not be concealed.
9. Where a group of Customers are served from a service raceway, the covers to the raceway and/or pull boxes shall be provided with a means of sealing by the Company.
10. Customer load wires shall never be installed in raceways that contain unmetered wires.

## 11. GROUNDING

- a. All services shall have a grounded neutral.
- b. Grounds shall be established as required by the N.E.C., Authority Having Jurisdiction and the Company. Grounding resistance shall meet N.E.C. requirements.

## 12. CONDUCTOR MARKING

- a. All neutral conductors shall be clearly marked with a white or gray marker at the Point of Delivery and at the meter location or CT cabinet.
  - b. The "208 volt to ground phase" (high leg - right hand side, c position) of each 120/240 volt, 3-phase, 4-wire service shall be clearly marked with an orange marker at the Point of Delivery and at the meter location or CT cabinet.
  - c. Phase conductors other than the "high leg" phase shall be clearly marked with color markers at the Point of Delivery and at the meter location if more than one conductor per phase is used. **Colors used for this purpose shall be the option of the electrician but shall be the same color for each conductor of the same phase. Phases to be marked A, B, C on CT installations.**
  - d. Conductors shall be marked 12" from the end of a service entrance, weatherhead or conduit.
13. Customer shall provide a disconnect switch for any Customer-owned streetlighting which is directly connected to Company facilities. This disconnect switch shall meet all appropriate codes. These streetlighting facilities shall be equivalent in load to any established Tariff for Company-owned lighting.

## B. TEMPORARY SERVICE

1. The Company shall be consulted for detailed plans of each installation where temporary service is to be supplied. Installations requiring special service, meter or other work for construction purposes, exhibits of short duration, etc., shall be made at the expense of the Customer.
2. Temporary installation of Service Entrance, other wiring and meters shall be made and inspected in the same manner as permanent installations.
3. Temporary service for construction purposes may be either overhead or underground depending on available service. Arrangements for temporary construction service are shown in **Figures 11, 15, 16 and 17.**
4. The temporary Service Drop or temporary construction wires or cables shall not be tied to the Customer's permanent panel except for test purposes.
5. All temporary saw poles or underground pedestals shall have a driven ground.
6. The TUG (Temporary Underground) is available for residential service where the permanent meter enclosure, meter and riser pipe are configured such that they can be used for temporary service. Because the TUG is utilized to provide temporary service, as well as permanent, and at the time of installation the building may not be ready to display a permanent address, the address shall be identified on the meter enclosure. Upon receipt of the application for service for the TUG and the temporary inspection, the Company installs the permanent underground service to the meter enclosure. This service is used for construction purposes only until the Certificate of Occupancy is obtained. The builder will be responsible for having the service converted to the new homeowner's name.

One variation of the TUG involves building a portion of the permanent concrete block wall and mounting the permanent meter enclosure, riser pipe and customer overcurrent protection device on it. The main line switch and breakers are mounted in the panel with the receptacle mounted below the panel. Upon receipt of the Customer's contribution for the permanent underground service, the application for service and the inspection, the Company will install the permanent underground service and meter. The receptacles mentioned above are used for construction power.

AVAILABLE ONLY WHERE AUTHORITY HAVING JURISDICTION PERMITS ITS USE.

## C. OVERHEAD SERVICES

1. It is the Customer's responsibility to provide a suitable support for attachment of the Service Drop conductors. This support shall be capable of withstanding a minimum continuous force of 200 lbs. in the direction of the Service Drop.
2. A minimum of 24" of Service Entrance wire shall be left projecting from the weatherhead for connection to the Service Drop. The conductors shall be marked for phase identification at a point 12" outside of the weatherhead. See Section III-A-12 for marking requirements.
3. Where the installation involves more than one service riser, it is the responsibility of the Customer to connect the conductors from each riser together. The Company shall provide only one connection per phase. Refer to **Figure 51** for connection block details.
4. Unless otherwise required by local authorities and/or the "National Electrical Safety Code," the point of attachment of the Service Drop conductors shall be located by the Customer so as to meet or exceed the minimum clearances shown in **Figure 3** and as noted below.

### MINIMUM CLEARANCES OF SERVICE DROP CABLES

(Open wire Service Drops may require additional clearance)

Roads, streets, and other areas subject to truck traffic .....	18 feet
Driveways, parking lots and alleys .....	16 feet
Above residential driveways .....	16 feet
Spaces and ways subject to pedestrians or restricted traffic only .....	12 feet
Above or below roofs or balconies accessible to pedestrians .....	11 feet
Above or below roofs or projections not accessible to pedestrians .....	3½ feet
Horizontal to any structure .....	5 feet
Horizontal from directly below conductor to edge of swimming pool (shall meet the "National Electrical Code" requirements) .....	10 feet

5. Driveways, where vehicular traffic may pass under service wires, shall maintain the minimum clearances from ground to service wires required for roads, streets, alleys and parking lots in the above table. For further details, items and definitions not covered above; refer to the "National Electrical Code" and the "National Electrical Safety Code."

6. For service to mobile homes, refer to **Figures 8, 9, 10, 11 and 12.**
7. Where local inspecting authorities accept mobile homes as a permanent installation, refer to **Figures 1, 2 and 7**, which may apply.
8. Risers in excess of 72" above rooflines shall be accessible by Company bucket trucks. Refer to **Figure 2.**
9. The Customer may be charged a "Contribution-in-Aid of Construction" for any cost incurred by the Company as a result of relocation or repair of Company facilities necessitated by grade changes, additions, swimming pools, etc.

## **D. UNDERGROUND SERVICES**

**(72 hours prior to digging please call 1-800-432-4770)**

### **1. GENERAL**

- a. Underground service is available based on the Company's currently filed Tariffs and the "Commercial-Industrial Underground Service Policy." The Company should be contacted for the applicability of the underground service policies and possible charges involved before plans are made for underground service.
- b. In certain areas where the Company has underground distribution, underground service shall be used, and overhead service shall not be available to the Customer.
- c. The Customer may be charged a "Contribution-in-Aid of Construction" for any cost incurred by the Company as a result of relocation or repair of Company facilities necessitated by grade changes, additions, swimming pools, etc.
- d. Direct buried underground services shall maintain a minimum of five (5) feet from the water's edge of a swimming pool or greater, if required by the "National Electrical Code," "National Electrical Safety Code," or local authorities.
- e. Some jurisdictions may require special permitting as to the routing of the underground cable.
- f. Customer service conductors within padmounted transformers may be cut and shaped by the Company to make connection to the point of service. Reasonable effort shall be made to keep the length of conductors of the same phase equal in length.
- g. Any obstruction which prevents installation of the Company's conduit shall be resolved between the Customer and the Company at the Customer's expense.
- h. For delivery voltages of 4160/2400 volts 3 phase, customer cable shall be terminated with voltage stress relief terminators. (Revised 1/13)

## 2. RESIDENTIAL SERVICES

- a. All residential underground distribution, including services, shall be installed under the terms of the Company's filed rates and Tariffs. A copy of this section is available for inspection at Company offices.
- b. Normal service voltage shall be 120/240 volt, single phase, 3-wire. Three phase, 4-wire service shall be provided only if the provisions of Section II-D have been met. In large multi-story developments, service voltage may be 120/208 volt, single phase, 3-wire, at the option of the Company, to the individual residential Customer. [When the service is 120/208V single phase, 3-wire, a fifth jaw is required in the meter enclosure.](#)
- c. **The Customer shall request the Company to designate the Point of Delivery for each service location before construction is started. Residential instrument transformer installations refer to Section IV-D and Figures 44 and 45.**
- d. Special routing may incur additional cost to the Customer.
- e. Any conduit risers installed by the Customer for the Company shall have 30 inch radius bends, and shall extend 3 feet below grade, and be at least 5 feet away from the building. For residential underground CT services, refer to Section 3, d. below.
- f. Whenever the Company provided conductors are terminated in a meter base enclosure, dual rated connector lugs; minimum rating AL7CU shall be provided.

### 3. COMMERCIAL-INDUSTRIAL SERVICES

- a. All commercial and industrial underground services shall be installed under the terms of the Company's "Commercial-Industrial Underground Service Policy."
- b. Normal service voltages are: 120/240 volt, single phase, 3-wire; 120/208 volt, 3-phase, 4-wire; and 277/480 volt, 3-phase, 4-wire. In Network areas and certain established industrial parks, 120/208 volt, single phase, 3-wire service may be available. Service voltage of 120/240 volt, 3-phase, 4-wire, shall **not** normally be available with underground service. **It is important that the Customer contact the Company to determine the voltage that is available at a desired service location before construction is started.**
- c. All services in a Network shall receive 120/208 volt, 3-phase, 4-wire service.
- d. The designated Point of Delivery may be in a Company-owned distribution box or in a padmount transformer. The Customer shall leave a minimum of five (5) feet of the Service Entrance conductors in position for connection by the Company, unless a shorter length is approved for a specific installation. The conductors shall be marked for phase identification both at the end of the conductors and at a point 12" outside of the conduit or 12" above pad/pedestal base. **The Company does not run new underground commercial and industrial services.** See Section III-A-12 for marking requirements. Refer to **Figure 51** for connection diagrams.

The following is the PSC ruling concerning CIG customer responsibility for underground conductor and equipment.

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**Ruling:** It may have been preferable for PEF to formally amend its tariff to reflect this change. However, PEF's existing tariff language does address the point of delivery as required by rule. It was not unreasonable for PEF to believe that the Handbook change was sufficient to implement what it saw as a construction practice not specifically addressed in the tariff. As a result of the prior modifications to the PEF Requirements for Electric Service and Meter Installations Handbook, there is no basis to grant the relief. All current C/I customers, even those whose underground service beyond the designated point of delivery was installed and owned by the Utility, will be responsible for the full replacement cost of their underground conduit and equipment when the conduit and equipment fails or wears out. "[PEF will continue to maintain the lines it previously installed until maintenance, in PEF's sole discretion, is no longer feasible and replacement is the only viable option.]"



- e. Cogeneration Interconnections to secondary Networks shall not be permitted where the Customer's generator shall deliver energy in excess of the Customer's requirements at any time. Special control equipment may be required to prevent backflow of current through the Interconnection.

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## SECTION IV

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### METERING INSTALLATIONS

#### A. GENERAL REQUIREMENTS

1. The Company shall furnish and connect all meters, Instrument transformers and meter control wiring necessary to complete the meter installation.
2. **For proper selection of metering equipment, it is the Customer's responsibility to furnish the Company specific information such as:** type of service (OH or UG), service voltage(s), main line switch amperes, maximum amperes and the number and size of the Customer's Service Entrance conductors.
3. The Customer shall furnish and install the necessary meter enclosure(s), equipment for CT installations and other equipment. For CT installations, see Section IV-D.
  - a. **K-Base applications are not allowed in Duke Energy Florida, Inc. Service area.**
  - b. On installations where **the service size does not exceed 400 amps**, a self-contained meter enclosure shall be used (**from approved meter equipment enclosure list**). On all **commercial** installations 400 amps and below, a heavy-duty jaw tension release meter enclosure with a lever type by-pass shall be installed. **A heavy-duty jaw tension release meter enclosure with lever type by-pass is required for traffic signals.**

**EXCEPTION #1:** On the following strictly limited unoccupied single phase commercial installations: lighted sign boards, small parking lot lighting, temporary saw poles, unoccupied single phase commercial installations with UPS backup, irrigation timers and cable amplifiers (but not motor or pump loads) a residential type meter enclosure without lever type by-pass may be used. Consult Company engineers for any deviations.

**EXCEPTION #2:** Temporary services for construction trailers or any other temporary buildings, single phase 200 amperes or less.

- c. On all meter installations where **the service size is 401 amps and above**, transformer rated (CT) metering is required.

- d. On all installations (400 amps or less) where the service voltage is 240/480 volts, 277/480 volts or 480 to ground, a non-automatic disconnect device shall be provided and installed by the Customer on the line side of each individual meter. The disconnect device shall be lockable or sealable by the company and adjacent to each meter (see **Figure 38**). For meter centers, there shall be one disconnect device on the line side of each meter. The Customer-owned non-automatic (no over current protection) disconnect device ampacity shall equal or exceed the customer's main capacity. A heavy-duty, jaw tension release enclosure with lever type bypass, shall be installed **(from the approved meter equipment enclosure list)**.
- 4. On installations, repairs, replacement or upgrade of enclosures involving more than one meter, on a single premise, the following guidelines apply:
  - a. The Customer shall purchase and use single meter equipment for group installations as shown in **Figures 37 and 39**.
  - b. The Customer shall purchase and use group meter equipment as described in Section IV-B and shown in **Figures 40, 41 and 42**.
  - c. Each meter enclosure shall be correctly identified on the outside front by a non-ferrous metal or plastic plate a minimum of 3/4" high, 1-1/2" wide and 1/16" thick, with letters a minimum of 1/4" high engraved or stamped to indicate the apartment number, office suite, lot number, etc. **The plate shall be riveted to the meter enclosure.**
  - d. The inside of each meter enclosure shall be correctly identified with a plate described above, or with permanent marker.
  - e. The address on the building or service location shall be permanently and prominently displayed and visible from the street, as required by the Authority Having Jurisdiction.

- f. At the time each meter is being installed/activated by Company service personnel, the Customer or his Agent will provide one or more representative(s) with appropriate communicative devices to verify that each premise address corresponds to the permanent marking on each meter enclosure. Any incorrect markings discovered during verification will terminate future installations of meters until all meter enclosures have been correctly marked. Verification of correct markings is the responsibility of the Customer.
5. Not more than one conductor shall be installed in a single terminal in any meter cabinet, trough or pedestal (unless Listed and Labeled for the application). Conductor strands shall not be cut in an effort to fit conductors into terminals.

**EXCEPTION:** Surge arrester leads may be installed under single load side terminals in self-contained meter enclosures.

6. Proper clearance for the line side conductors shall be left inside meter enclosures and/or cabinets by the Customer. See **Figures 22, 24, 26, 28, 30 and 32** for proper meter enclosure clearances.

## **B. CUSTOMER PURCHASED METER ENCLOSURES AND ASSOCIATED EQUIPMENT**

1. Any Customer-owned devices associated with the housing of Company-owned metering equipment shall be for the exclusive use of the Company and conform to the physical and electrical requirements listed in this section as shown in the appropriate figures. The following requirements are based on safety for Company employees, adequate line service connections and grounding, mounting stability and security from unauthorized energy use:
  - a. For list of approved meter enclosures, refer to the latest Florida Meter Group List.
  - b. The device shall be labeled with the manufacturer's name, catalog number, electrical rating for volts and amps, and service and load terminal wire size range for copper and aluminum wire.
  - c. The service and meter compartments shall provide for locking and sealing by the Company. The Company reserves the right to modify Customer-owned equipment for safety and security purposes.

2. Customer-owned meter centers and pedestals shall conform to the requirements of Paragraph 1 above and the following additional requirements:
  - a. The line and load compartments shall be separated by a stable barrier.
  - b. The line compartment shall provide for padlocking.
  - c. The pedestal top shall be fastened so as not to allow easy access to line terminals or bus.
  - d. The load wiring from the pedestal shall not inhibit entrance to the service compartment.
  - e. Metal pedestals shall have adequate coating on the burial portion for permanent and complete protection from corrosion. Wood is not permissible.
  - f. When a direct burial pedestal is installed, the meter pedestal shall be rigid enough to withstand forces applied (200 lbs.) when meters are installed and/or removed.
3. **The Customer shall be responsible for all maintenance of meter enclosures and related facilities.**
4. **Customer purchased commercial and residential meter centers shall be approved prior to use. Equipment not meeting the Company's specifications shall not be energized. Please contact the Company Representative with the manufacturer's name and model number to request approval.**
5. For Three Phase to Three Phase Module Meter Centers, See Section VII.

**NOTE:** For approved configuration see **Figure 55**.

## C. METER LOCATION

1. The location of meters is an important consideration to both the Company and the Customer. The Company shall always be consulted and shall endeavor to select a location that shall be the most suitable to both parties.
2. **Figures 1 through 16 and 21 through 46** show typical meter installations. In unusual cases, the Company shall be consulted.
3. Meters shall be located on the building in a place where they shall be protected from mechanical damage. The location should not be affected by a kitchen discharge fan or other vents, or the drain from a roof gutter or air conditioner and should be free from vibration. The Customer shall be responsible for providing this protection.
4. Meter sockets and enclosures shall be securely mounted in a plumb and level position on a solid wall or structure. The Customer shall be responsible for securely fastening the meter enclosure in order to withstand the normal forces required to routinely remove and install the meter.
5. **Meter enclosures shall not be recessed or framed in any way that blocks access, knockouts or drainage. See Figures 2 and 7.**
6. **On new construction the center of the meter shall not be more than 5½ feet maximum or less than 4 feet minimum from the ground (final grade) or floor unless otherwise noted in drawings shown in this book.**

**EXCEPTION:** In areas where the requirements mandate that the meter be located above 5½ feet from grade, ready and permanent accessibility to the meter shall be supplied for reading and testing. This may be a FEMA requirement, check with your local Authority Having Jurisdiction. See **Figure 5.**

7. **A clear space at least 48" from the front of all meter enclosures shall be maintained from grade to 6' 7" height or top of equipment, whichever is greater, minimum of 36" wide (18" on each side of center line of meter enclosure) to allow easy and safe access for reading and testing. This will be enforced on all existing and new installations. See Figure 4.**
8. Commercial metering shall normally be installed outdoors. Exceptions to this must be approved by the Meter Department **prior** to installation.

9. Meters for single family residences shall always be located outdoors and shall normally be on the front half of a side wall, or on the front wall, and shall not be enclosed by a fence. Meters shall not be located in areas such as carports, open porches, swimming pools, etc., which are susceptible to subsequent enclosures by walls or screens. Any deviation shall be approved in writing by an Authorized Company Representative.
10. **In the event a meter area is later enclosed or otherwise made inaccessible or unsafe, the Customer shall, at his expense, have the meter facilities moved to a readily accessible outside location.**
11. Meter installations should, whenever possible, be outside. However, they may be grouped together in a meter room furnished by the Customer provided the following requirements are met:
  - a. Meter rooms should normally be located on the first floor. At the option of the Company, however, they may be located on various floors at mutually agreeable centralized locations.
  - b. The Company shall have access to the meter rooms at all times for reading, testing and servicing the equipment. When meters are located in areas that can be locked, the Customer shall make arrangements such that the Company shall have access to the meters at all times. The Company shall provide a key lock box that can be used for this purpose. Further information may be obtained at Company offices.
  - c. Meters installed inside shall be in a clean, dry, lighted, safe place and be easily accessible at all times. They shall not be located in rest rooms, dressing rooms, bedrooms, kitchens, ventilating or elevator shafts, boiler rooms, laundry rooms, hallways, etc. They shall not be installed near belts or other moving machinery endangering the safety of those doing work near the meter.
  - d. **Adequate space, lighting and access shall be provided as defined in consultation with the Company as the facilities are planned. Using meter rooms for storage or other purposes which cause a degradation in ease of access or adequacy of workspace shall not be allowed.**
  - e. **Failure to maintain a safe accessible location for meters shall require that they be relocated to an appropriate location at the Customer's expense.**

## D. CURRENT TRANSFORMER INSTALLATIONS

1. The size of current transformers shall be determined by the Company.
2. It is very important to both the Company and the Customer that the instructions and construction details shown in **Figures 43 - 46** be followed closely on all current transformer installations. **Current transformer polarity markings shall face the line side of the service.**
3. The facilities necessary for current transformer installations shall be provided and installed as described below:
  - a. The Customer shall provide and install all inter-connecting raceways or conduit. All such conduit or raceways shall be a minimum of 1½ inch in diameter and a maximum of 30 feet in total length unless otherwise approved by the Meter Department. For installations entirely or partially below ground, 1½ inch schedule 40 PVC conduit minimum shall be used. For installations entirely above ground, 1½ inch minimum schedule 40 PVC or metallic conduit may be used.
  - b. Current transformers and enclosures:
    - (1) The Customer shall provide and install the enclosures for the meter and the current transformers.
    - (2) The Company shall provide the current transformers and the Customer shall install the current transformers except on Company-owned facilities. **Polarity markings shall face line side of service.**
    - (3) The Company shall provide and install the current transformers when installed on Company-owned facilities.
  - c. The Company shall provide and install the current transformer secondary wiring and meter.
  - d. The Customer shall not terminate nor splice his conductors within the CT enclosure unless directly to the line side conductors or devices (Requires approval from the Meter Department). When attachment is necessary, a suitable insulated connector shall be supplied by the Customer, leaving space for attachment to the line side conductors. **See Table 1.**
  - e. On installations where more conductors are required than is permitted in **Table 1**, the Customer shall provide a junction box adjacent to the CT enclosure to terminate his conductors. If the Customer purchased junction box is on the line side of the CT enclosure, it shall be sealable.



4. Current transformer installations are usually made by one of four means, each of which requires coordination between the Customer and the Company.
  - a. Indoor/outdoor current transformer enclosures are normally used when the Customer receives either overhead or underground service. See **Figures 43 and 44.**
  - b. Existing services, which have wall mounted or riser mounted overhead current transformer cabinets shall continue to be serviced. Additions to existing services shall be permitted, but when services are totally rebuilt, they shall be converted to indoor/outdoor wall mounted CT enclosures. When additions are made to existing services, contact the Company for installation requirements.
  - c. Switchgear current transformer installations are usually used for large Customer installations. In these cases, the following requirements apply:
    - (1) All current transformers furnished by the Company are for the exclusive use of the Company.
    - (2) Current transformers shall be installed ahead of all breakers/switches and fire pumps unless otherwise required by local code or specifically waived by the Company Meter Supervisory Personnel.
    - (3) A separate compartment shall be provided to contain three current transformers and so designed that the transformers can be readily changed after the switchgear is installed. This compartment shall have a hinged door and be sealable and lockable by the Company.
    - (4) The Customer shall provide the Company with detailed drawings of the current transformer arrangement for acceptance and approval before constructing the switchgear.
  - d. Current transformer installations in transformer vaults and padmounted transformers are applicable only where the vault or transformer provides service for a single Customer at a single rate. In these cases, the following requirements apply:
    - (1) Meters shall not be located inside the transformer vault.
    - (2) Written approval from the local engineering office shall be obtained prior to the installation of current transformers in vaults or switchgear.

- (3) A 1½ inch schedule 40 PVC conduit minimum shall be installed by the Customer from the current transformer location to the approved meter location for termination in the meter enclosure. See **Figure 46** for typical padmounted transformer installations.
  - (4) Necessary meter wiring shall be installed and connected by the local Field Meter Technician.
  - (5) Customer-owned current transformers are not permitted on Company padmounted transformers.
5. **A clear space at least 48" from the front of all instrument transformer enclosures shall be maintained from grade to 6' 7" height or top of equipment, whichever is greater, minimum of 36" wide (18" on each side of center line of meter enclosure) to allow easy and safe access for reading and testing. This will be enforced on all existing and new installations.**

## E. SURGE ARRESTERS

1. Surge arresters may be installed on customer owned, self-contained meter enclosures provided that the arresters are properly installed, meet the safety standards set forth below and do not interfere with the voltage delivered or the proper registration of the meter. The standards set forth below are for safety related reasons only and do not address the ability of the arrester to dampen or reduce surge events. Arresters installed shall bear the appropriate label or markings indicating that they have been manufactured to meet the required safety standards.
2. Surge arresters shall not be installed on Company-owned equipment.
3. Surge arrester safety requirements for meter sockets:
  - a. Surge arresters must comply with applicable ANSI/IEEE, UL or other nationally recognized testing laboratory (NRTL) safety standards.
  - b. In addition, all surge protection devices shall be certified to a Stepped Current Impulse Test. This test consists of the application of increasing steps of current impulses until fuse or device failure, whichever comes first. The starting impulse should be 10KA with increasing steps of 5KA each until failure. A cooling off period of three minutes is used before the next application of impulse current. The device should fail without exploding or catching on fire. The fuse elements should clear sufficiently to prevent current from passing. Please refer to IEEE C62.41-1991 (to be revised to IEEE C62.34) relating to all surge protection devices less than 1000 volts.
  - c. All surge protection devices shall be certified to a Limited Current Abnormal Overvoltage Test (Open Neutral). The MCOV of the device shall be multiplied by 1.6 to determine the test voltage. *Example: 175 MCOV x 1.6 = 280 Test Volts.* The right side should be tested at a current level of 5A and the left side should be tested at a current level of 25A. The fuse links or elements should successfully clear the forced voltage without emission of sparks or flames or any unsafe deformation of the housing. Please refer to UL 1449 Section 37.4.1.
  - d. All 200 Amp Meter Jaw Based Residential Surge Arrestors shall disconnect MOV's upon failure by interrupting a minimum fault current of 10KA.

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## SECTION V

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### EQUIPMENT VAULTS

#### A. GENERAL REQUIREMENTS

1. In a few situations, it may be necessary or convenient to install Company-owned transformers and/or related equipment in a vault inside a Customer's building. In such cases, **the Customer shall consult with the Company before plans are made concerning the vault.**
2. The vault shall be constructed in compliance with Company requirements, the "National Electrical Code" and such local requirements as may be in force.
3. The vault shall not contain any Customer-owned equipment for building service facilities such as: secondary fuses, switches, meters, load control equipment; gas, oil, steam or water pipes; or ventilation ducts other than those required by the Company.
4. Fire sprinkler systems shall not be installed in Company equipment vaults unless specifically required by local authorities.
5. The vault and its contents shall be under the supervision of the Company, and shall have provisions for locking and security sealing by the Company. Unauthorized persons shall not be permitted to enter vaults.

## **B. CUSTOMER RESPONSIBILITIES**

1. The Customer shall provide and own the following facilities for use by the Company:
  - a. Equipment vault sized and built in accordance with Company requirements.
  - b. All facilities required to provide natural or forced ventilation determined necessary by the Company.
  - c. All conduit within the building for the Company's facilities, including primary and/or secondary conductors. Such conduit shall extend 5 feet beyond the outside building wall to a point designated by the Company.
  - d. Access means including elevators, where applicable, such that transformers and equipment can be rolled from the street or sidewalk directly to and from the vault.
2. The Customer shall also provide properly executed easements on the Company's forms for all facilities installed on the Customer's property.

## **C. COMPANY RESPONSIBILITIES**

1. The Company shall determine the physical requirements for each vault, including minimum size, ventilation, lighting and conduit. The Company shall endeavor to work closely with the Customer so that the needs of the Company and the desires of the Customer are considered in the design and construction of the vault(s).
2. The Company shall provide and own the following:
  - a. Transformer(s) and/or additional necessary equipment.
  - b. Primary and/or secondary cable(s) and related connections.
  - c. Connections to Customer-owned service cable or bus.

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## SECTION VI

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### CUSTOMER UTILIZATION EQUIPMENT

#### A. GENERAL

1. The Company builds and maintains adequate lines to supply proper service to all Customers using normal equipment. However, since equipment installed by one Customer may vary materially affect the adequacy and continuity of service to other Customers, and because the misuse of some equipment might constitute a fire hazard or endanger life, the Company has established regulations covering the more common installations of utilization equipment.
2. The Company specifies only such requirements as are necessary to safeguard both the Customer and the Company to the end that service may be rendered with a maximum of safety and with a minimum of interruption or disturbance. The Customer should consult the Company for additional details on special equipment which may not be covered in this book.
3. **Available fault current shall be taken into consideration when specifying Service Entrance equipment. It is important that the Customer contact the nearest engineering office for the value of available fault current.**
4. **Protection of equipment against loss of voltage, under-voltage, transient or sustained over voltage, voltage unbalance, overcurrent, phase failure, phase reversal, loss of synchronism, harmonics and short circuit is the responsibility of the Customer.**
5. To protect the property of the Customer and the Company, the Customer shall not overload or overfuse the building's service or branch circuits.

## B. SINGLE PHASE AIR CONDITIONERS/HEAT PUMPS

1. Air conditioners and heat pumps are treated separately from other motor loads. This is because the standard design of the electric distribution system includes capacity for their addition. The cost of the facilities needed to provide the capacity is included in our rates and is based on a starting current of 30 amps per ton.
2. Where these units are connected to a single phase 240 volt supply, the starting current shall not exceed the values listed below.

<b>Size (Tons)</b>	<b>BTU/H</b>	<b>Starting Current (AMPS) @ 240 Volt and 95% P.F.</b>
1	12,000	30
1½	18,000	45
2	24,000	60
3	36,000	90
4	48,000	120
5	60,000	150

**NOTE:** If necessary, starting kits should be used to reduce starting currents to the above limits and shall be part of the original installation. (If the starting current exceeds these limits consult with the Company's local Engineering office.)

## MOTOR STARTING REQUIREMENTS GUIDE

<b>Type of Motor Operation</b>	<b>Multiple Customers from single transformer And Secondary lines</b>	<b>Multiple Customers From single Transformer</b>	<b>Network Service</b>	<b>Single Customer Service</b>
Continuous Motor Operation (one start per day)	Locked Rotor Current less than 100% of transformer full load current	Locked Rotor Current less Than 150% of Transformer full load current	Locked Rotor Current less than 200% of service ampacity	Locked Rotor Current less than 200% of transformer full load current
Cycling Operation 10 Min/cycle	Locked Rotor Current less than 75% of transformer full load current	Locked Rotor Current less Than 100% of Transformer full load current	Locked Rotor Current less than 150% of service ampacity	Locked Rotor Current less than 200% of transformer full load current
Cycling Operations 1 Min/cycle	Locked Rotor Current less than 50% of transformer full load current	Locked Rotor Current less Than 75% of Transformer full load current	Locked Rotor Current less than 75% of service ampacity	Locked Rotor Current less than 200% of transformer full load current
Cycling Operations Less than 1 Min/cycle	Locked Rotor Current less than 25% of transformer full load current	Locked Rotor Current less Than 25% of Transformer full load current	Locked Rotor Current less than 50% of service ampacity	Locked Rotor Current less than 100% of transformer full load current



## **C. MOTORS**

1. Residential and commercial Customers located in predominantly residential areas shall normally be provided with single phase service. Three-phase service availability is discussed in Section II-D of this book.
2. All motors which cannot be safely restarted should be provided with a device to insure that the motor shall be disconnected from the line, or the starting device returned to the "off" position, whenever there is a failure of the supply voltage. To prevent unnecessary shutdown, it is recommended that this device be equipped with a time delay feature so it shall not function unless required.
3. When a Customer's motor starting causes objectionable flicker to other Customer's, the Company shall require installation of devices such as reduced voltage or part winding starters to limit starting inrush currents to values that shall reduce flicker to acceptable levels.
4. Where the Customer's own voltage stability requirements permit and where full voltage starting is mechanically and electrically suitable for the Customer's motors and equipment, the preceding table is used as a guide for the motor starting inrush that is generally acceptable.

## **D. SPECIAL EQUIPMENT**

1. All flashing signs or lights served by the Company shall be provided with the necessary type of switching equipment to eliminate undesirable flicker, and radio or television interference to other Customers.
2. Due to the very severe operating characteristics of such equipment as electric welders (particularly of the transformer type), furnaces, X-ray machines, tankless hot water heaters and radio and television broadcasting stations, the Customer shall apply to the Company for approval to use such equipment before installation is made.
3. When the operation of any equipment is detrimental to satisfactory operation of the Company's distribution system, the Company shall require the installation of special equipment such as lines and transformers at the expense of the Customer.
4. When a Customer generates an unacceptable level of harmonic distortion, the Customer shall, at his expense, be required to install equipment necessary to reduce this distortion. If non-linear loads are greater than 500 KVA, or greater than 15% of the total load, contact the Company for specific requirements prior to placing these loads in service. Customer compliance with the IEEE 519 recommended practice is required. Examples of non-linear loads include: silicon controlled rectifiers, rotary phase converters, power supplies, variable speed motors, transformers, personal computers, laser printers, etc.
5. Portable generators may be installed beyond the meter enclosure on the load side conductors or other facilities, as long as the installation has been inspected by the local inspecting authority, and has the proper transfer scheme to insure safety to the customer and the Company.
6. Emergency and Standby Generators and other power producing equipment shall be connected such that no backfeed can occur through the Service Entrance. Standby generators that energize Company-owned equipment or that can be momentarily paralleled with the Company's system shall require a contract specifying administration procedures, operating procedures, safety equipment and cost responsibility.
7. **The Company does not guarantee computer grade electrical service. The Company should be contacted to determine what auxiliary equipment is needed to supply this service.**

8. The Company offers an Energy Management Program to its qualified Customers, which consists of remotely controlled devices that turn off certain appliances during peak Demand periods. There are no installation costs to the Customer and the Customer receives monthly credits on their electric bill. For further information, contact the Company.
7. Customer-owned current transformers are not permitted on Company padmounted transformers.
8. When the Customer purchases an Energy Management System, the Company can provide meter pulse information. There is a one-time charge for this service. For further information, contact the Company.

## E. GENERATION

Operation of customer-owned electric power generation sources can take many forms, from traditional fuel powered to renewable generation (wind, solar, tidal, methane, etc.), all of which involve special attention to safety for customers.

Please refer to the Florida Interconnection Procedures section of Company website <http://www.progress-energy.com/environment/ras/florida.asp> for details related to the interconnection of customer-owned electric power generation.

Emergency and Standby Generators shall be connected as follows:

Transfer switches must be “break-before-make” or must not parallel longer than 100 milliseconds (0.10 sec)

Systems paralleling for more than 100 milliseconds require approval in writing from Company before being connected. Auto-transfer switchgear protecting the generator must provide a grounding provision on the secondary buss as dictated in Figures 47 - 49. The utility side breaker must provide a lockable-open feature.

Generation Interconnection Requirements: Cogenerators and small power producers interconnected with the Company shall be controlled to prevent backfeed into the Company's lines when the Company service to the Interconnection is interrupted. These and other requirements are outlined in the FPSC's Rule 25-17.087 Interconnection and Standards, and above referenced Florida Interconnection Procedures. Before any interconnection is established, the customer shall contact the Company Distribution Interconnected Generation Office and submit sufficient information on the generation and control equipment to allow the Company to determine the necessary safety and control equipment that shall be added to its line to permit safe and reliable service to its Customers and for Company personnel safety. All costs of the interconnection beyond cost of normal electric service are borne by the customer. (see Figures 57A & 57B for Net Metering configurations)

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## SECTION VII

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### THREE- PHASE TO THREE- PHASE MODULAR METER CENTERS

#### A. GENERAL

1. Company standards require clockwise rotation at the distribution transformer and the meter socket on all 3-phase metering applications. When connecting a Wye service, connect the 3-phase conductors to the over current protection main breaker disconnect device in the following manner to achieve clockwise rotation at the meter socket: Terminate A-phase (Black), B-phase (blue), C-phase (red). See **Figure 56**.

When connecting a Delta service, connect the 3-phase conductors to the over current protection main breaker disconnect device in the follow manner to achieve clockwise rotation at the meter socket: Terminate A-phase (black), B-phase (orange), C-phase (blue). See **Figure 56**.

#### B. LABELS

1. It is the customer's responsibility to properly label the Meter Centers.
2. Labels are to be made of metal or plastic, 5" x 8" with 1/2 inch high letters, embossed or engraved, affixed by rivet to the outside and inside of the main compartment. Each meter socket shall also have a tag 1" x 4" with 1/4 inch high letters. Labels are to have highly visible contrasting colors between the font characters and the background. Red font or red background color is not permissible.

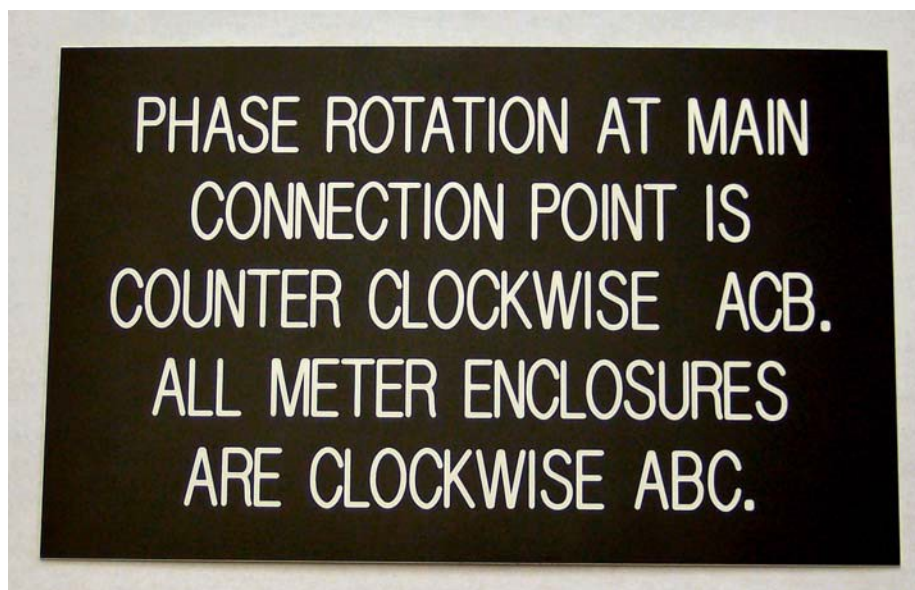


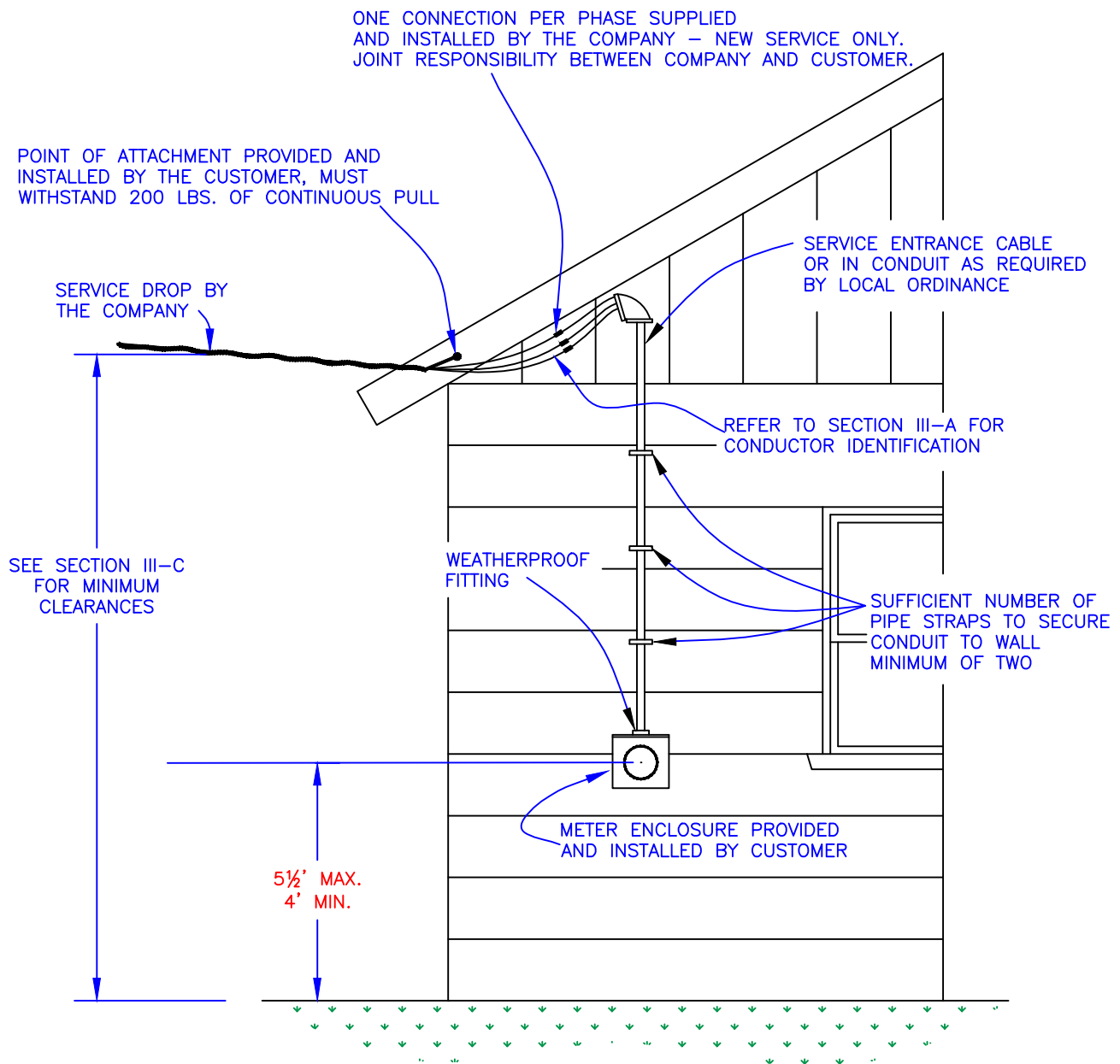
Image 1

3. The Label at the main disconnect shall reflect Image 1.
4. Placement of this Label should be on the inside of the main compartment where it would be seen when the main cover is opened or removed.
5. Another Label shall be placed on the outside on the main breaker enclosure in plain site.
6. The Label at the meter enclosure shall reflect Image 2.



Image 2

7. Placement of this Label shall be placed on the outside of each cover.
8. Failure to comply with the wiring and labeling process will prompt the service **NOT** to be energized.



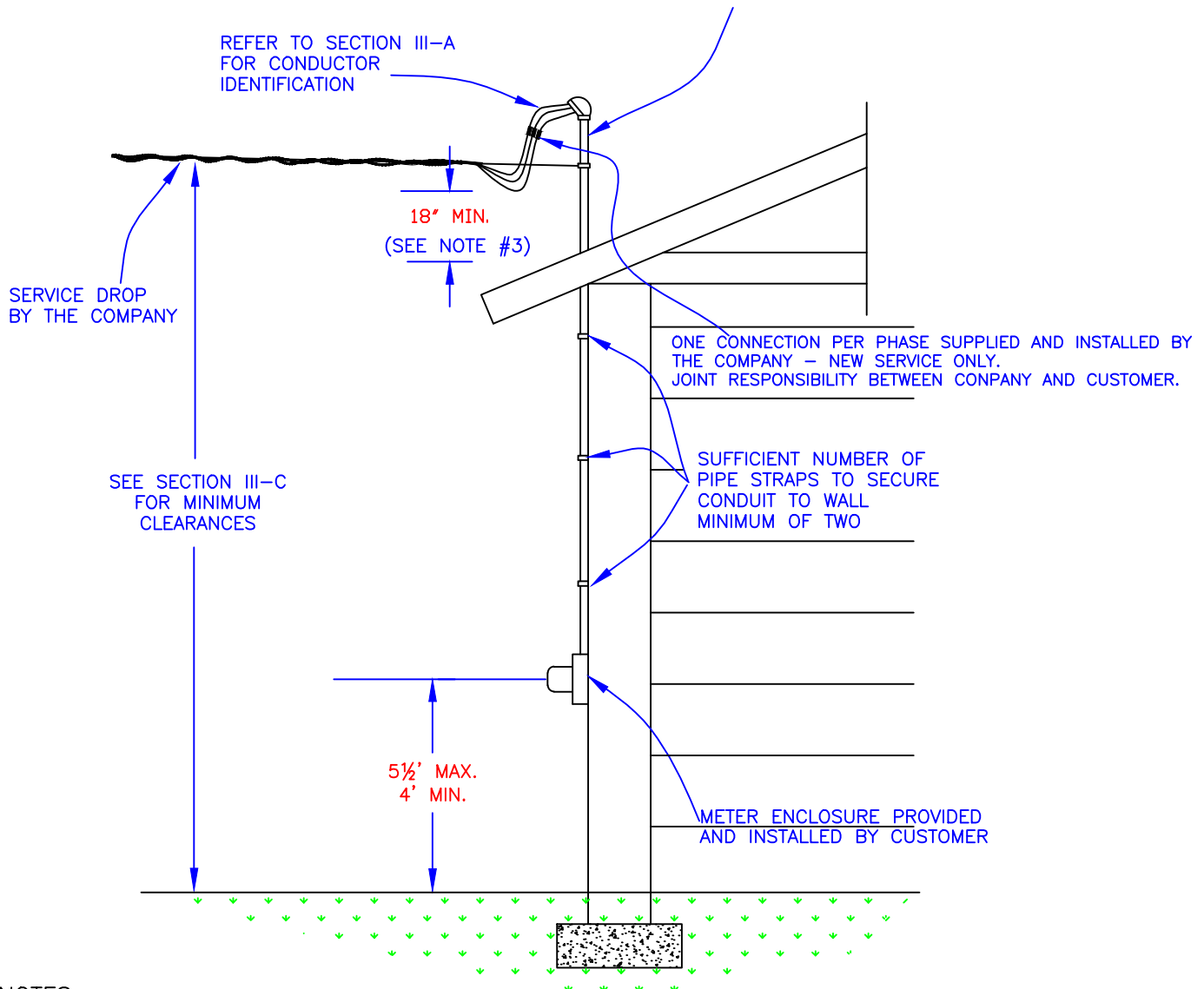
NOTES:

1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
2. CATV OR TELEPHONE CABLE SHALL NOT BE ATTACHED TO THE SERVICE MAST.
3. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

## TYPICAL OVERHEAD SERVICE INSTALLATIONS

Figure 1

2" MINIMUM RIGID METAL CONDUIT (SCHEDULE 40) PROVIDED AND INSTALLED BY CUSTOMER. GUY IS REQUIRED IF CONDUIT EXTENDS MORE THAN 3' ABOVE ROOF. MUST WITHSTAND 200 LBS. OF CONTINUOUS PULL. THE COMPANY TO PROVIDE POINT OF ATTACHMENT. RISER IN EXCESS OF 72" ABOVE ROOF LINE MUST BE ACCESSIBLE BY COMPANY BUCKET TRUCK. SEE SECTION III C-8.



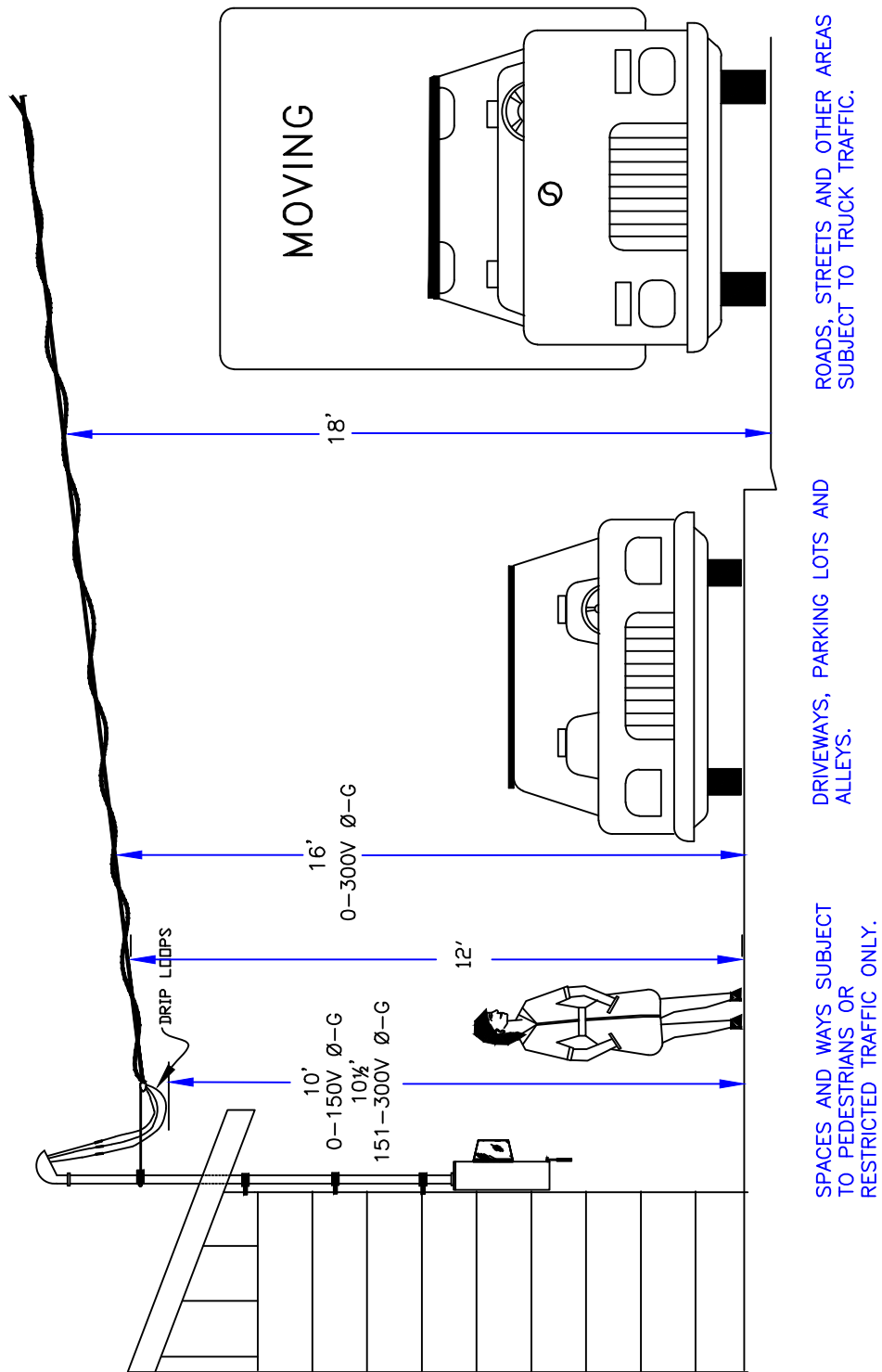
#### NOTES:

1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
2. CATV OR TELEPHONE CABLE SHALL NOT BE ATTACHED TO THE SERVICE MAST.
3. FOR SPECIFIC MINIMUMS, REFER TO N.E.C. AND LOCAL CODES.
4. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

### TYPICAL OVERHEAD SERVICE INSTALLATIONS

Figure 2





ROADS, STREETS AND OTHER AREAS  
SUBJECT TO TRUCK TRAFFIC.

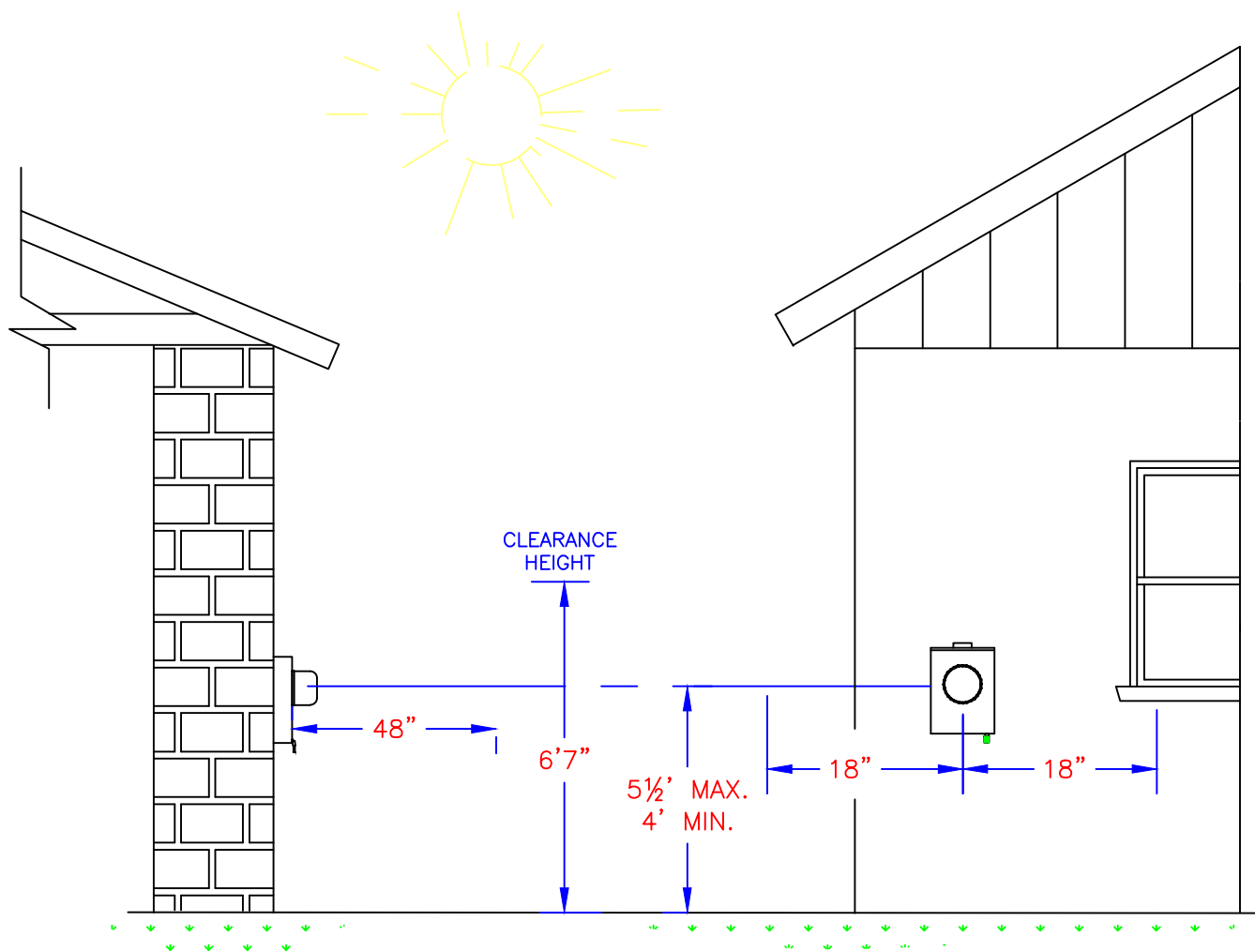
DRIVEWAYS, PARKING LOTS AND  
ALLEYS.

SPACES AND WAYS SUBJECT  
TO PEDESTRIANS OR  
RESTRICTED TRAFFIC ONLY.

REFER TO SECTION III-C FOR ADDITIONAL CLEARANCE REQUIREMENTS

## CLEARANCE REQUIREMENTS FOR OVERHEAD SERVICE DROPS

Figure 3

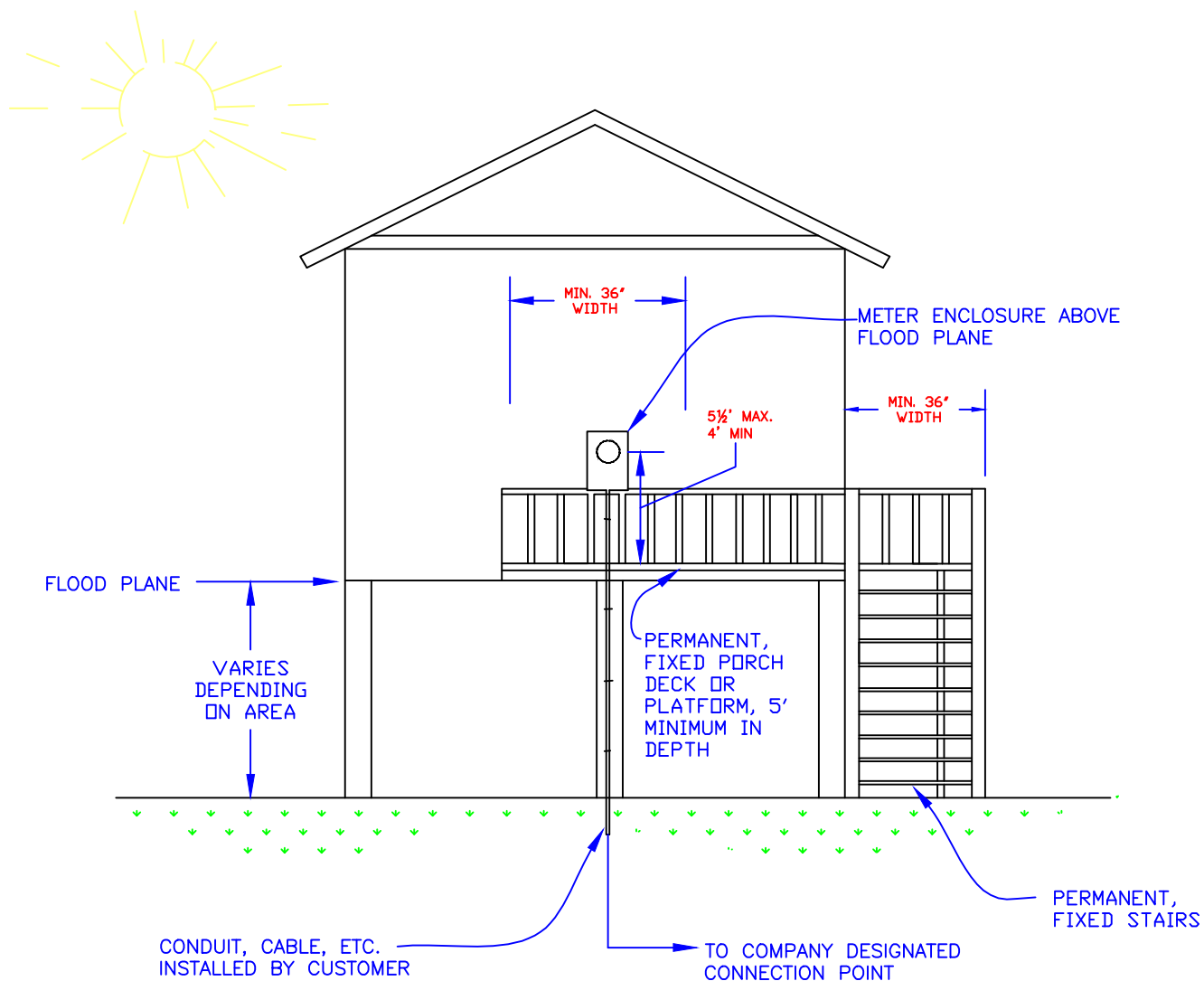


NOTES:

1. A CLEAR SPACE SHALL BE MAINTAINED TO ALLOW EASY AND SAFE ACCESS FOR READING AND TESTING.
2. AT LEAST:
  - » 48" FROM THE FRONT OF ALL METER ENCLOSURES.
  - » FROM GRADE TO 6'7" HEIGHT OR TOP OF EQUIPMENT, WHICHEVER IS GREATER.
  - » MINIMUM OF 36" WIDE (18" ON EACH SIDE OF CENTER LINE OF METER ENCLOSURE).
3. THIS WILL BE ENFORCED ON ALL EXISTING AND NEW INSTALLATIONS.

## METER ENCLOSURE CLEARANCES

Figure 4

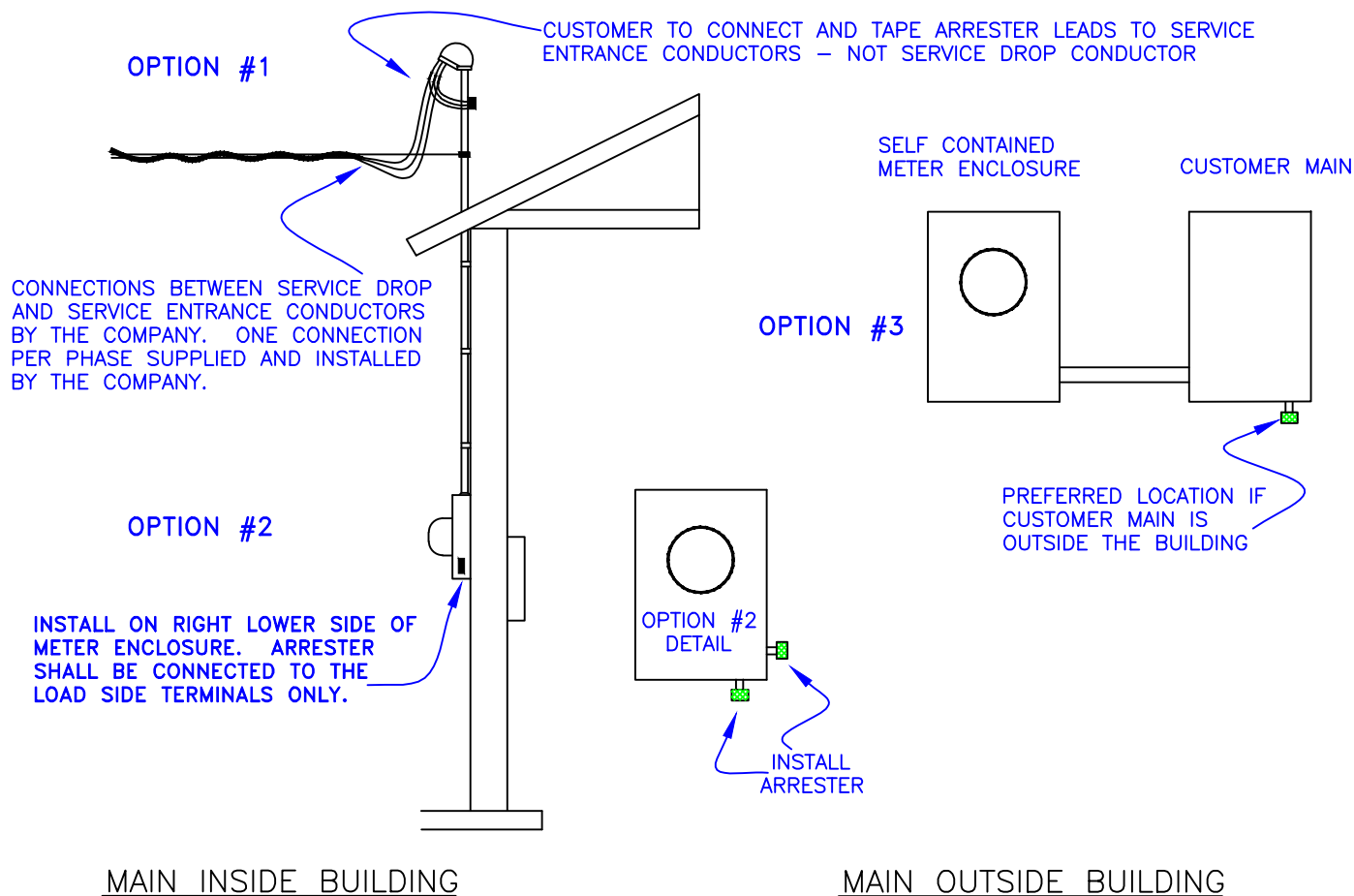


NOTES:

1. PLATFORM 5' IN DEPTH IS ESTIMATED TO MEET 4' METER ENCLOSURE CLEARANCE REQUIREMENTS OF FIGURE 4.
2. PORCH, DECK, PLATFORMED STAIRS MUST BE PERMANENTLY FIXED AND APPROVED BY AUTHORITY HAVING JURISDICTION.
3. ACCESS METHOD TO METER MUST BE APPROVED BY COMPANY METER DEPARTMENT.

## METER ENCLOSURE INSTALLATIONS IN FLOOD ZONES

Figure 5

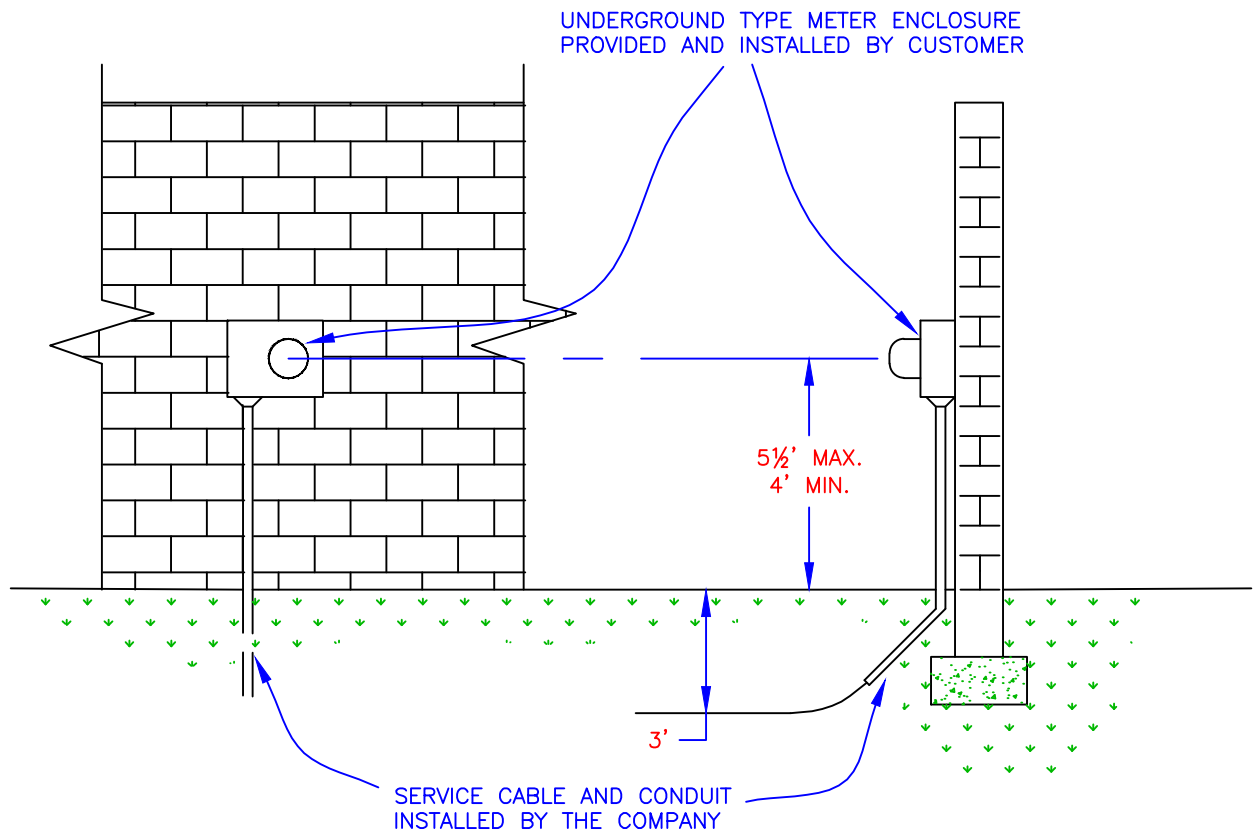


#### SURGE ARRESTER INSTALLATION

1. SURGE ARRESTERS SHALL NOT BE INSTALLED IN OR ON THE COMPANY'S CABINETS OR ENCLOSURES.
2. COPPER AND ALUMINUM CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE N.E.C. AND THE AUTHORITY HAVING JURISDICTION.
3. A CONTINUITY TEST INDICATING AN OPEN CIRCUIT, PHASE TO PHASE AND PHASE TO NEUTRAL, SHALL BE PERFORMED PRIOR TO INSTALLATION.
4. INSTALLATION OF SURGE ARRESTERS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
5. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH N.E.C. AND LOCAL CODES. SEE SECTION III-A.
6. ARRESTERS MUST BE RATED FOR SERVICE VOLTAGE.

### **SURGE ARRESTER INSTALLATION**

**Figure 6**

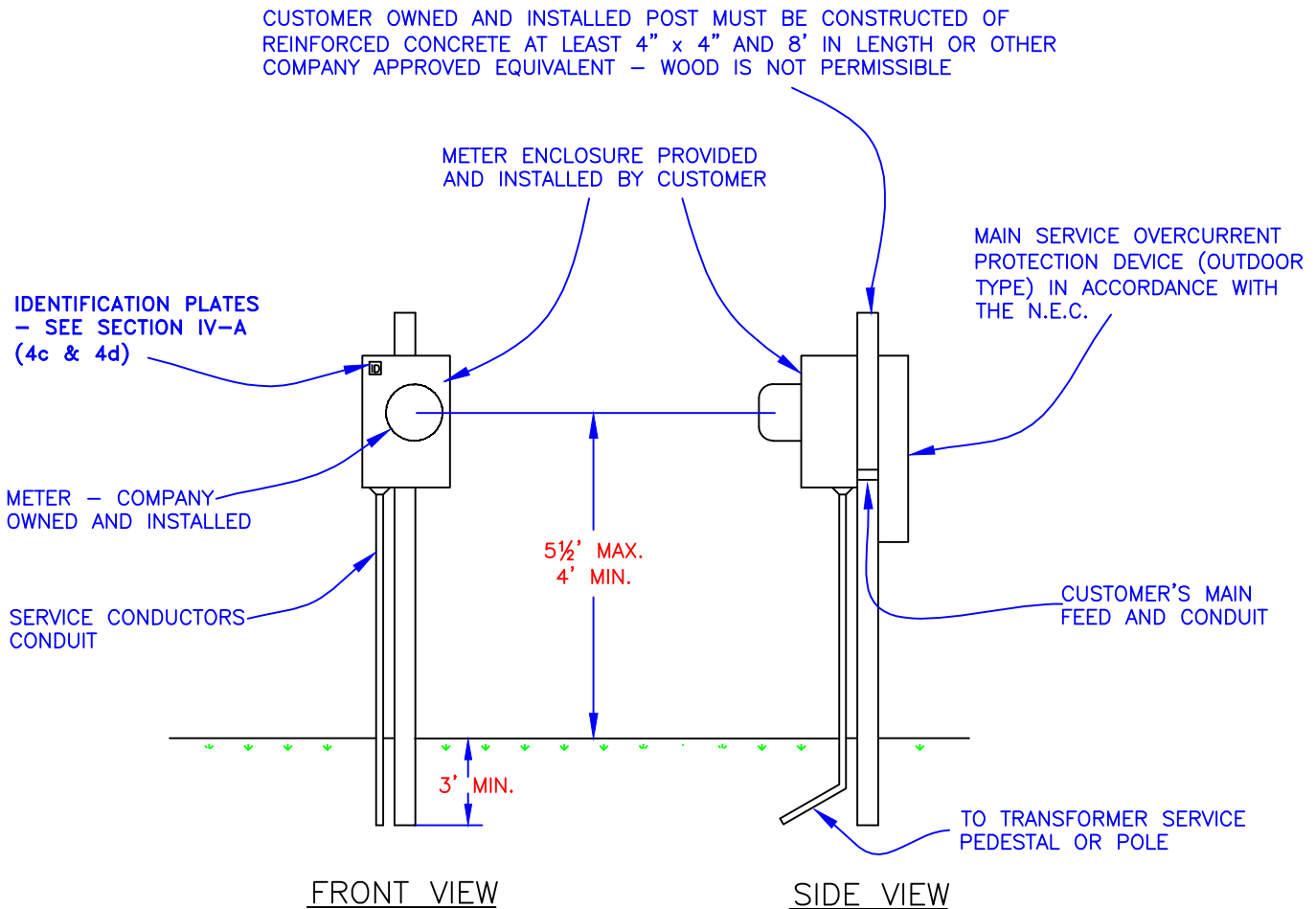


NOTES:

1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
2. ANY OBSTRUCTION WHICH PREVENTS INSTALLATION OF THE COMPANY'S CONDUIT SHALL BE RESOLVED BETWEEN THE CUSTOMER AND THE COMPANY AT THE CUSTOMER'S EXPENSE.
3. EARLY INSTALLATION OF THE METER ENCLOSURE AND NOTIFICATION OF THE COMPANY THAT THE UNDERGROUND SERVICE CONDUCTORS CAN BE INSTALLED WILL HELP AVOID DELAYS AND EXTRA COST TO THE CUSTOMER.
4. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
5. THE METER LOCATION SHOULD NOT BE AFFECTED BY A KITCHEN DISCHARGE FAN OR OTHER VENTS, OR THE DRAIN FROM A ROOF GUTTER OR AIR CONDITIONER AND SHOULD BE FREE FROM VIBRATION.
6. ALL LINE SIDE CONDUCTORS SHALL BE OWNED BY THE COMPANY EXCEPT AS NOTED IN FIGURE 5 AND FIGURE 45.

## TYPICAL UNDERGROUND RESIDENTIAL SERVICE INSTALLATION

Figure 7

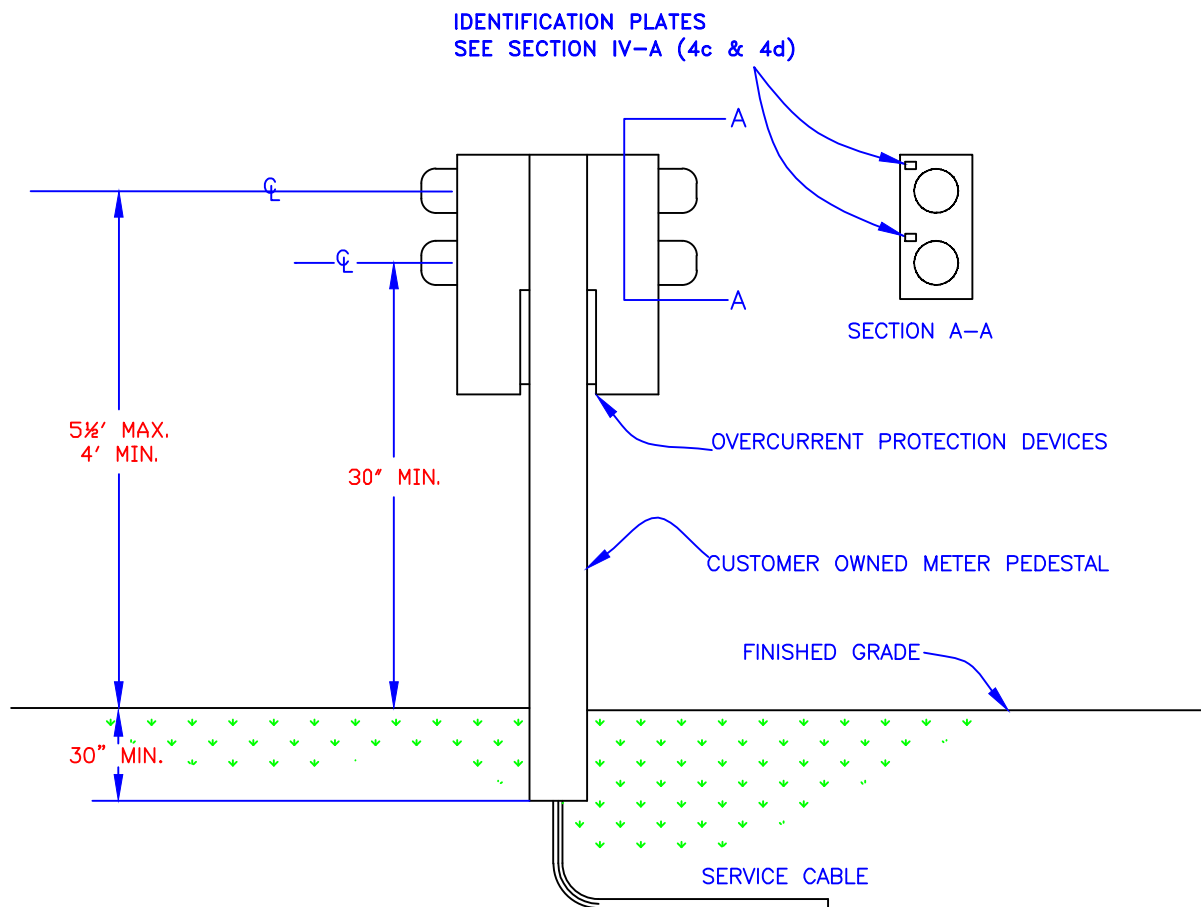


NOTES:

1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. CODES. SEE SECTION III–A.
2. THIS INSTALLATION MAY ALSO BE USED FOR METERING OF A SINGLE FAMILY HOME AT A LOCATION REMOTE FROM THE HOME. SEE NOTE 6, FIGURE 7.
3. METER PEDESTAL MUST BE RIGID ENOUGH TO WITHSTAND FORCES APPLIED WHEN METERS ARE INSTALLED OR REMOVED.
4. MULTIPLE POSTS MAY BE USED IF INSTALLATION WARRANTS.
5. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
6. THIS MAY BE USED ON SMALL COMMERCIAL OR CERTAIN RESIDENTIAL INSTALLATIONS.

**TYPICAL SINGLE MOBILE HOME UNDERGROUND PEDESTAL**

**Figure 8**



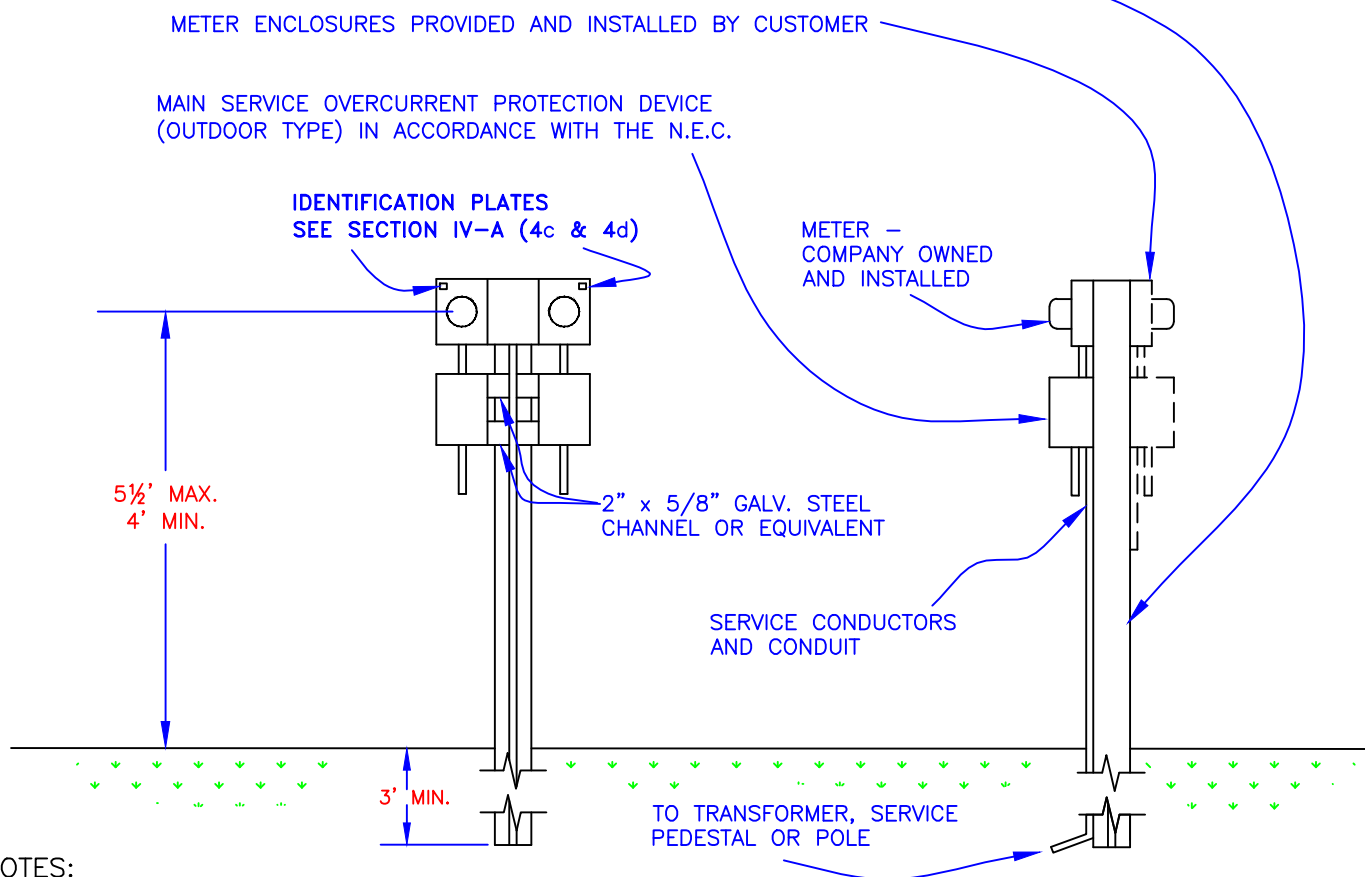
NOTES:

1. METER PEDESTAL MUST BE RIGID ENOUGH TO WITHSTAND FORCES APPLIED WHEN METERS ARE INSTALLED OR REMOVED.
2. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES.
3. PEDESTAL MUST COMPLY WITH REQUIREMENTS OF SECTION IV-B.
4. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
5. THIS MAY BE USED ON SMALL COMMERCIAL OR CERTAIN RESIDENTIAL INSTALLATIONS.

**TYPICAL UNDERGROUND SERVICE FOR MOBILE HOME CUSTOMER  
SUPPLIED METER PEDESTAL**

**Figure 9**

CUSTOMER OWNED AND INSTALLED POST MUST BE CONSTRUCTED OF REINFORCED CONCRETE AT LEAST 4" x 4" AND 8' IN LENGTH OR COMPANY APPROVED EQUIVALENT — WOOD IS NOT PERMISSIBLE



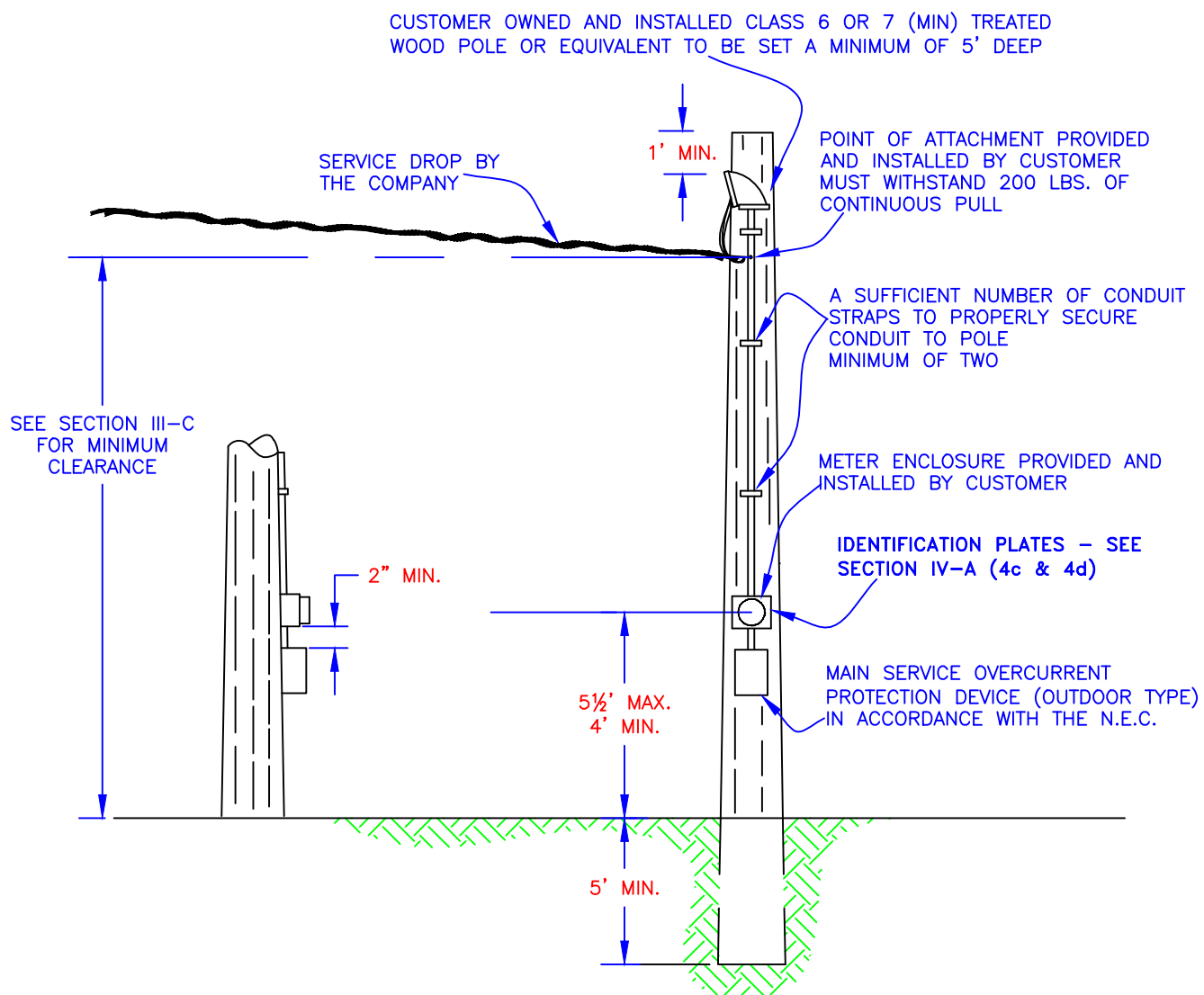
NOTES:

1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
2. THE APPLICATION REFERS TO 2-4 METERS. SINGLE METERS TO BE MOUNTED ON CENTER.
3. THIS INSTALLATION MAY ALSO BE USED FOR METERING OF A SINGLE FAMILY HOME AT A LOCATION REMOTE FROM THE HOME.
4. METER PEDESTAL MUST BE RIGID ENOUGH TO WITHSTAND FORCES APPLIED WHEN METERS ARE INSTALLED OR REMOVED.
5. MULTIPLE POSTS MAY BE USED IF INSTALLATION WARRANTS.
6. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
7. THIS MAY BE USED ON SMALL COMMERCIAL OR CERTAIN RESIDENTIAL INSTALLATIONS.

## TYPICAL MULTIPLE MOBILE HOME UNDERGROUND PEDESTAL

Figure 10



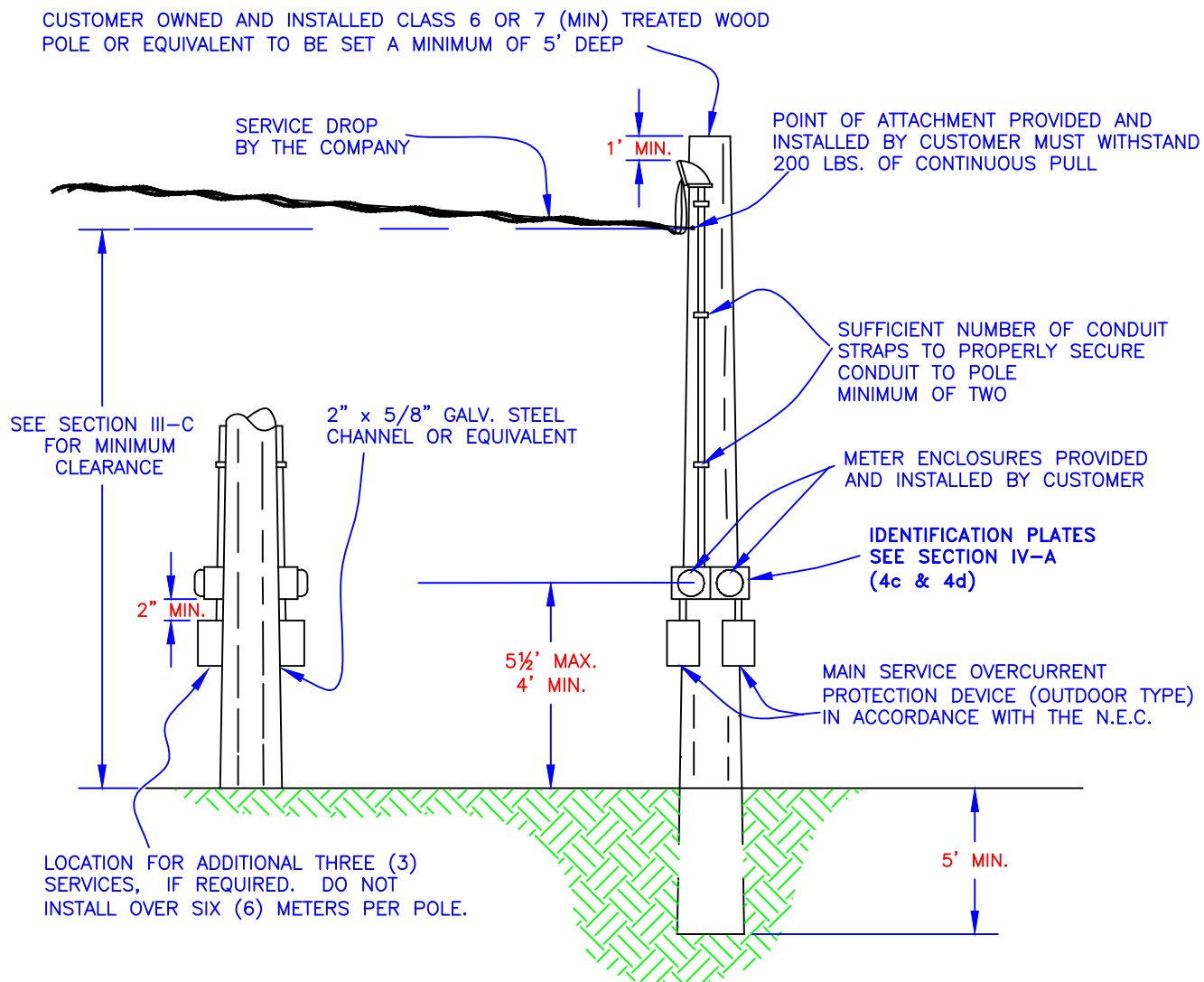


NOTES:

1. POLE MUST BE SUFFICIENTLY RIGID AND/OR BRACED TO WITHSTAND 200 LBS. PULL AT THE TOP.
2. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
3. REFER TO SECTION III-A FOR CONDUCTOR IDENTIFICATION.
4. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**MOBILE HOME OVERHEAD SERVICE, ONE HOME CONSTRUCTION,  
OPTIONAL TEMPORARY CONSTRUCTION SERVICE POLE**

**Figure 11**

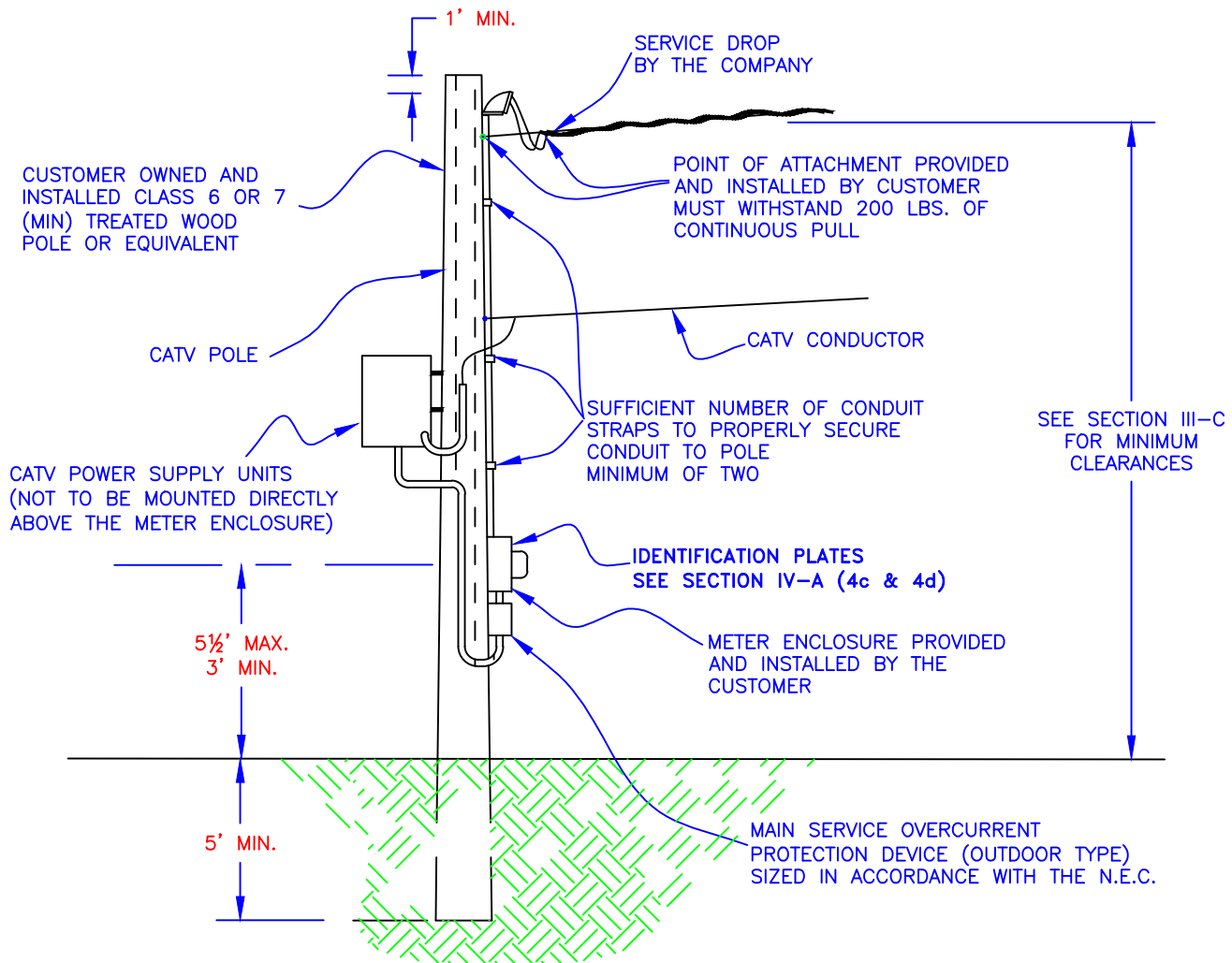


NOTES:

1. POLE MUST BE SUFFICIENTLY RIGID AND/OR BRACED TO WITHSTAND 200 LBS. PULL AT THE TOP.
2. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
3. REFER TO SECTION III-A FOR CONDUCTOR IDENTIFICATION.
4. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**MOBILE HOME OVERHEAD SERVICE  
MAXIMUM SIX HOME CONSTRUCTION**

**Figure 12**



NOTES:

1. CATV POLE CANNOT BE LOCATED DIRECTLY UNDER THE COMPANY'S CIRCUIT, UNLESS AGENCY GOVERNING RIGHT-OF-WAY REQUIRES BOTH COMPANY AND CATV POLES TO BE ON EDGE ON RIGHT-OF-WAY.
2. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
3. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

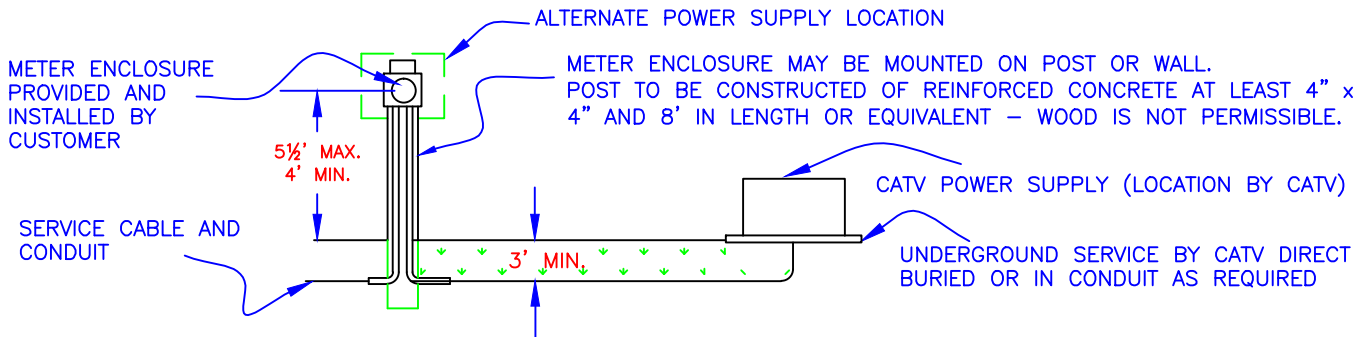
## CATV POLE OVERHEAD INSTALLATION

Figure 13

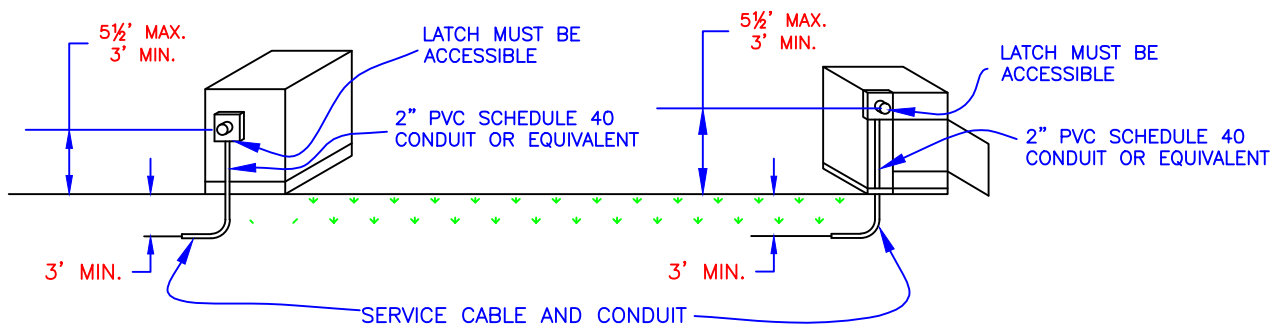
CATV/TELECOMMUNICATION MUST RUN UNDERGROUND SERVICE CABLE TO COMPANY EQUIPMENT AND MUST:  
USE LICENSED ELECTRICAL CONTRACTOR AND MEET N.E.C. REQUIREMENTS.

GROUND FACILITIES. IF CATV SERVICE PEDESTAL IS LOCATED LESS THAN 6' FROM COMPANY EQUIPMENT, CATV GROUND MUST BE BONDED TO COMPANY'S GROUND IF ONE EXISTS. CATV TO KEEP POWER SUPPLY/METER ENCLOSURE MINIMUM DISTANCE OF 3' (FROM SIDE) OR 10' (FROM FRONT) OF COMPANY'S PADMOUNTED TRANSFORMER AND 6' FROM COMPANY POLE.

HAVE INSTALLATION INSPECTED AND APPROVED BY LOCAL INSPECTION AUTHORITY.



### ALTERNATIVE POWER SUPPLY CABINETS



#### NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. CAUTION: CABLE LOCATION REQUIRED PRIOR TO INSTALLATION OF POST. CALL 1-800-432-4770. MINIMUM OF 72 HOURS NOTICE REQUIRED FOR LOCATION.
3. METER PEDESTAL MUST BE RIGID ENOUGH TO WITHSTAND FORCES APPLIED WHEN METERS ARE INSTALLED OR REMOVED.
4. A TRANSFER SWITCH IS REQUIRED TO PREVENT BACKFLOW OF CURRENT INTO THE COMPANY'S SYSTEM WHEN ALTERNATE POWER SOURCES ARE INSTALLED BY CATV.
5. AN ACCESSIBLE OVERCURRENT PROTECTION DEVICE IS REQUIRED.
6. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

### METERED CATV POWER SUPPLY INSTALLATION PADMOUNTED POWER SUPPLY WITH UNDERGROUND SERVICE

Figure 14

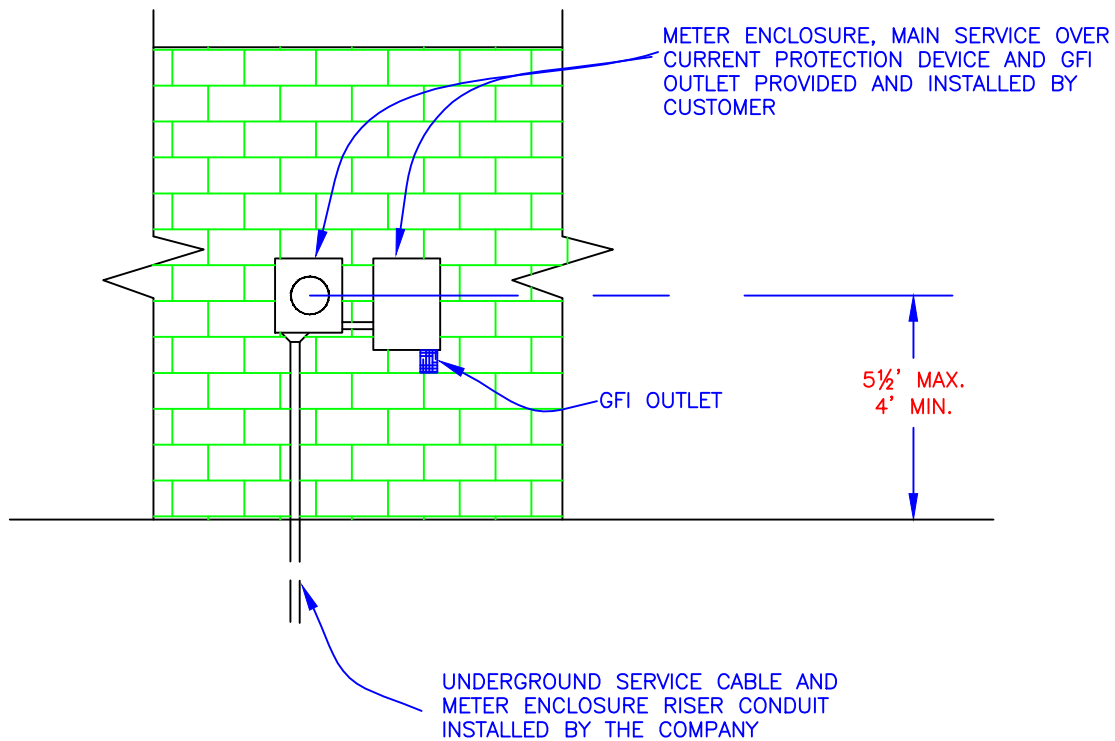
1. ALL LUMBER DIMENSIONS TO BE TRADE SIZE.
2. ALL LUMBER TO BE DECAY AND TERMITE RESISTANT.
3. POLES TO BE RATED FOR DIRECT BURIAL IN THE SOIL.
4. MINIMUM POLE SIZE 4" X 4" X 16' LONG. SEE SECTION III-C.
5. POLE MUST BE SUFFICIENTLY RIGID AND/OR BRACED TO WITHSTAND 200 LBS. OF PULL AT THE TOP.
6. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
7. POLES WITH 100 AMP, SINGLE PHASE SERVICE MAY HAVE A MAXIMUM SERVICE DROP OF 90' LENGTH; 101-200 AMP, SINGLE PHASE SERVICE MAY HAVE A MAXIMUM SERVICE DROP OF 70' LENGTH. FOR ALL THREE PHASE TEMPORARY SERVICES, THE COMPANY'S ENGINEERING DEPARTMENT MUST BE CONTACTED.
8. REFER TO SECTION III-A FOR CONDUCTOR IDENTIFICATION.
9. EQUIVALENT METAL STRUCTURES MAY BE ACCEPTABLE. CONTACT LOCAL COMPANY REPRESENTATIVE FOR APPROVAL.
10. REFER TO FIGURE 11 FOR OPTIONAL TEMPORARY CONSTRUCTION SERVICE POLE.
11. FOR 120/208 SINGLE PHASE, GROUND FIFTH JAW, 9 O'CLOCK POSITION PREFERRED.



59

## OPTIONAL

WHERE ALLOWED BY LOCAL INSPECTION AUTHORITY ONLY

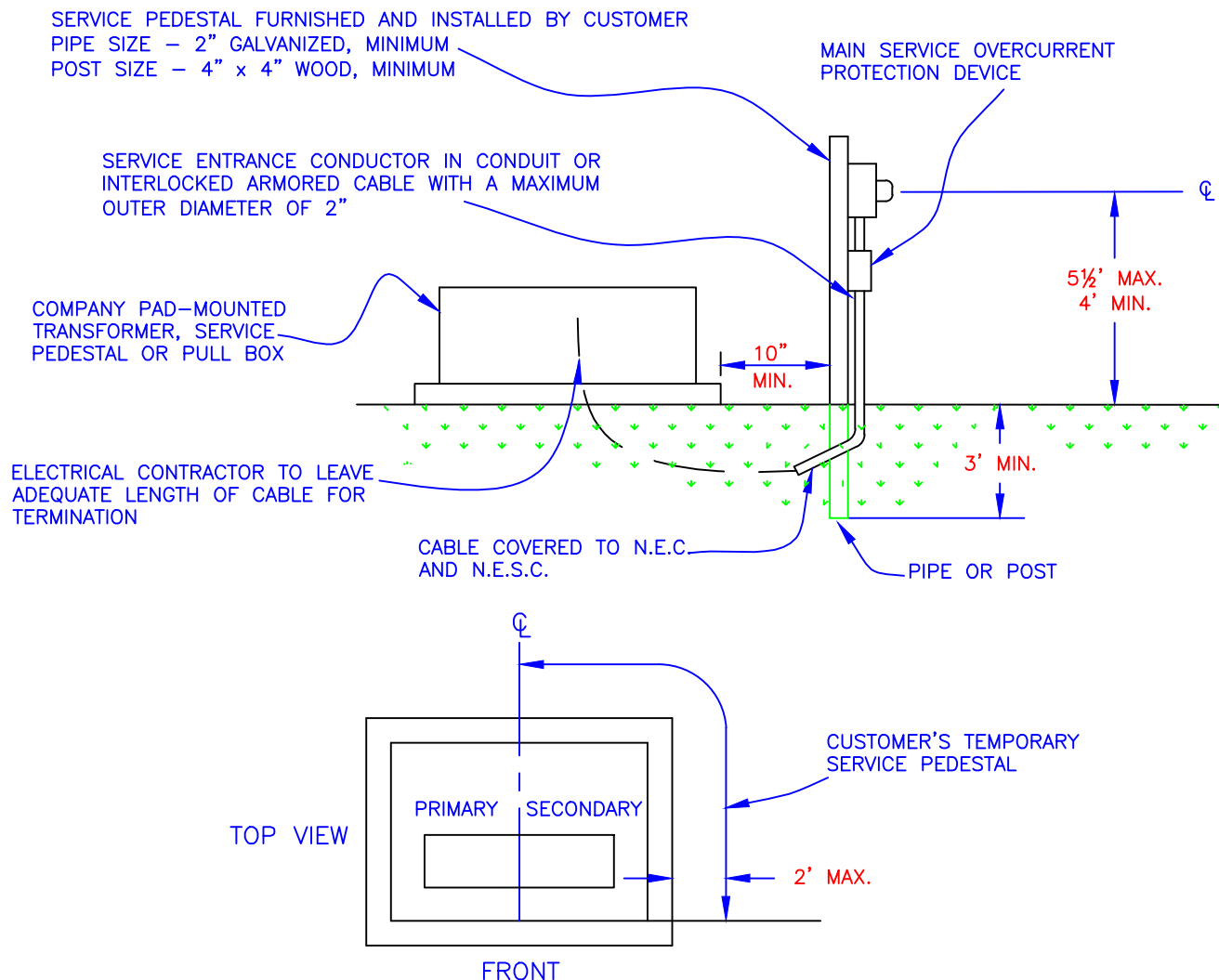


### NOTES:

1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES. SEE SECTION III-A.
2. MUST BE SURFACE MOUNTED ON A CONCRETE BLOCK WALL ONLY.
3. TUG METER BASE SHALL BE PERMANENTLY MARKED.

## TUG (TEMPORARY UNDERGROUND) SERVICE

Figure 16

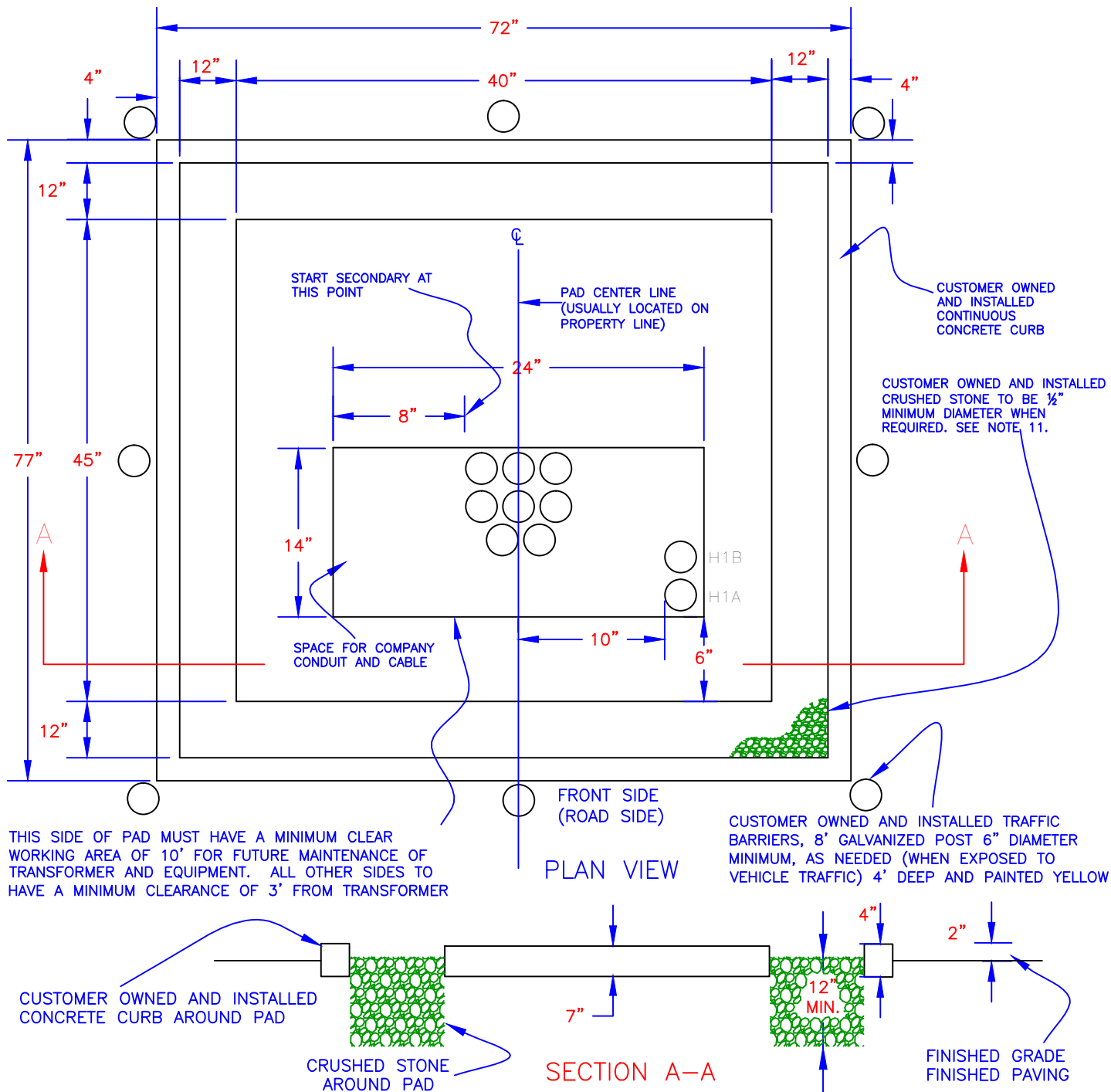


#### NOTES

1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. OR LOCAL CODES. SEE SECTION III-A.
2. CAUTION! "UTILITY LOCATES" REQUIRED PRIOR TO INSTALLATION OF TEMPORARY CONSTRUCTION POLE. CALL 1-800-432-4770. MINIMUM OF 72 HOURS NOTICE REQUIRED FOR "LOCATES".
3. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
4. FOR 120/208 SINGLE PHASE, GROUNDED FIFTH JAW, 9 O'CLOCK POSITION IS PREFERRED.

### TEMPORARY CONSTRUCTION SERVICE FROM PADMOUNTED TRANSFORMER, SERVICE PEDESTAL

Figure 17



MAX. NO. OF CONDUCTORS	MAX. NO. OF CONDUIT	NOTE
6 SETS 500 KCM OR LESS	6, (4 INCH)	PHASES TO BE MARKED WITHIN 12" OF CONDUIT
8 SETS 350 KCM OR LESS	8, (2 1/2 INCH)	PHASES TO BE MARKED WITHIN 12" OF CONDUIT

# **PRECAST CONCRETE MOUNTING PAD CONSTRUCTION DETAILS FOR 25 TO 167 KVA, SINGLE PHASE PADMOUNTED TRANSFORMERS**

**Figure 18A**

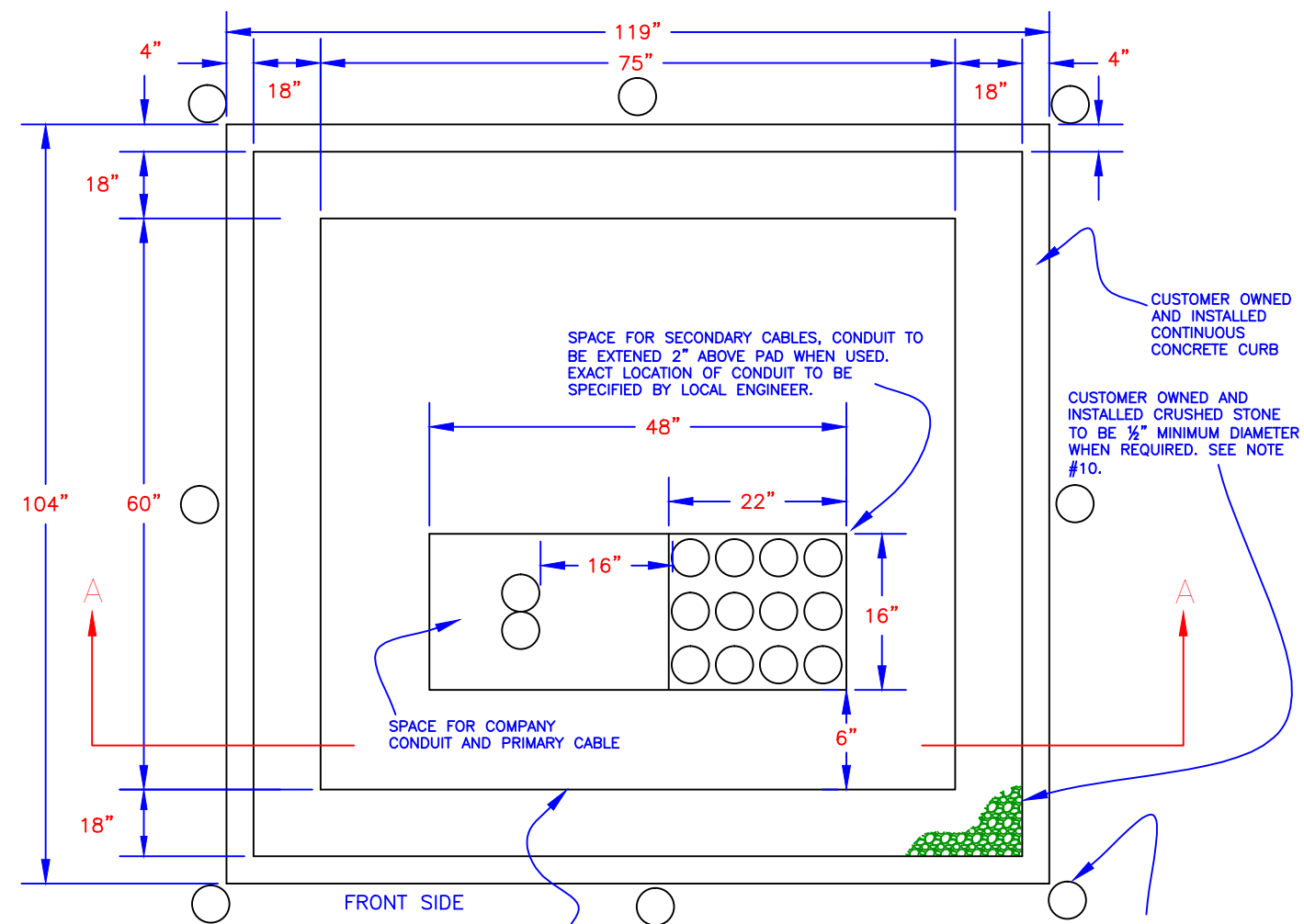


## NOTES:

1. THE GROUND SHALL BE LEVELED AND THOROUGHLY COMPACTED BEFORE THE PAD IS INSTALLED.
2. SIDE VENTILATION SHALL BE PROVIDED IF THERE IS A WALL CONSTRUCTED AROUND THE TRANSFORMER PAD.
3. APPROXIMATE WEIGHT: 470 LBS.
4. CONTACT COMPANY ENGINEERING REPRESENTATIVE FOR DETERMINATION OF NEED FOR CRUSHED STONE, CURBING AND TRAFFIC BARRIERS. EXACT ORIENTATION OF THE TRANSFORMER IN THE FIELD MUST BE APPROVED BY A COMPANY ENGINEERING REPRESENTATIVE.
5. LARGER SECONDARY CABLES ARE TO BE PLACED BEHIND SMALLER SECONDARY CABLES.
6. THE CENTERLINE OF THE PAD SHOULD BE ON THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED.
7. THERE SHALL BE NO ABOVE GROUND OBSTRUCTIONS WITHIN 10 FEET OF THE FRONT OF THE TRANSFORMER OR WITHIN 3' OF THE SIDES AND BACK. IF METERING TROUGH IS LOCATED BEHIND TRANSFORMER, MINIMUM CLEARANCE BETWEEN BACK OF TRANSFORMER AND CLOSEST PART OF TROUGH IS 6 FEET.
8. THE PAD IS SHOWN AS A REFERENCE AND IS INSTALLED AFTER CABLE AND CONDUIT IS INSTALLED.
9. EXTEND CONDUIT 2" ABOVE PAD AND CAP.
10. SOD MAY BE REQUIRED AROUND PAD TO PREVENT SAND EROSION.
11. IN AREAS WHERE TRANSFORMERS ARE TO BE ELEVATED ABOVE NORMAL GRADE, ENGINEERING DEPARTMENT MUST BE CONTACTED FOR APPROVAL OF DESIGN.

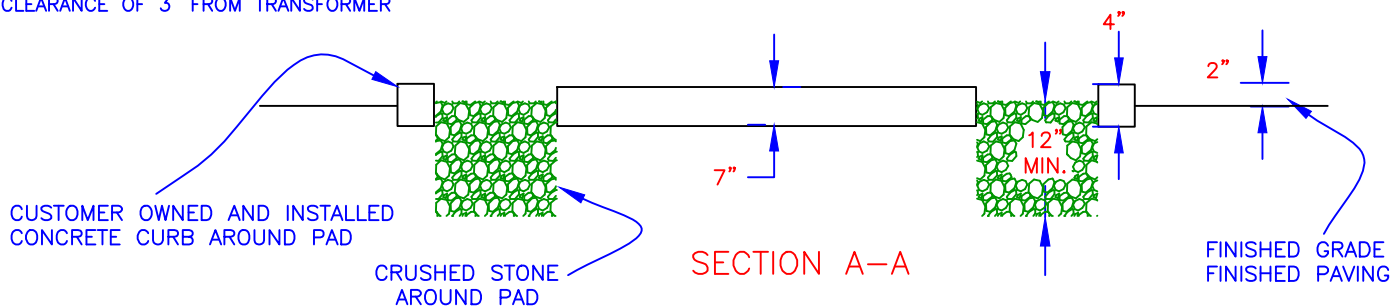
## **PRECAST CONCRETE MOUNTING PAD CONSTRUCTION DETAILS FOR 25 TO 167 KVA, SINGLE PHASE PADMOUNTED TRANSFORMERS**

**Figure 18B**



PLAN VIEW

CUSTOMER OWNED AND INSTALLED TRAFFIC BARRIERS, 8' GALVANIZED POST 6" DIAMETER MINIMUM, AS NEEDED (WHEN EXPOSED TO VEHICLE TRAFFIC) 4' DEEP AND PAINTED YELLOW



MAX. NO. OF CONDUCTORS	MAX. NO. OF CONDUIT	NOTE
12 SETS 750 KCM OR LESS	12, FOUR INCH	PHASES TO BE MARKED WITHIN 12" OF CONDUIT

## **PRECAST CONCRETE MOUNTING PAD CONSTRUCTION DETAILS FOR 75 TO 300 KVA, 3 PHASE PADMOUNTED TRANSFORMERS**

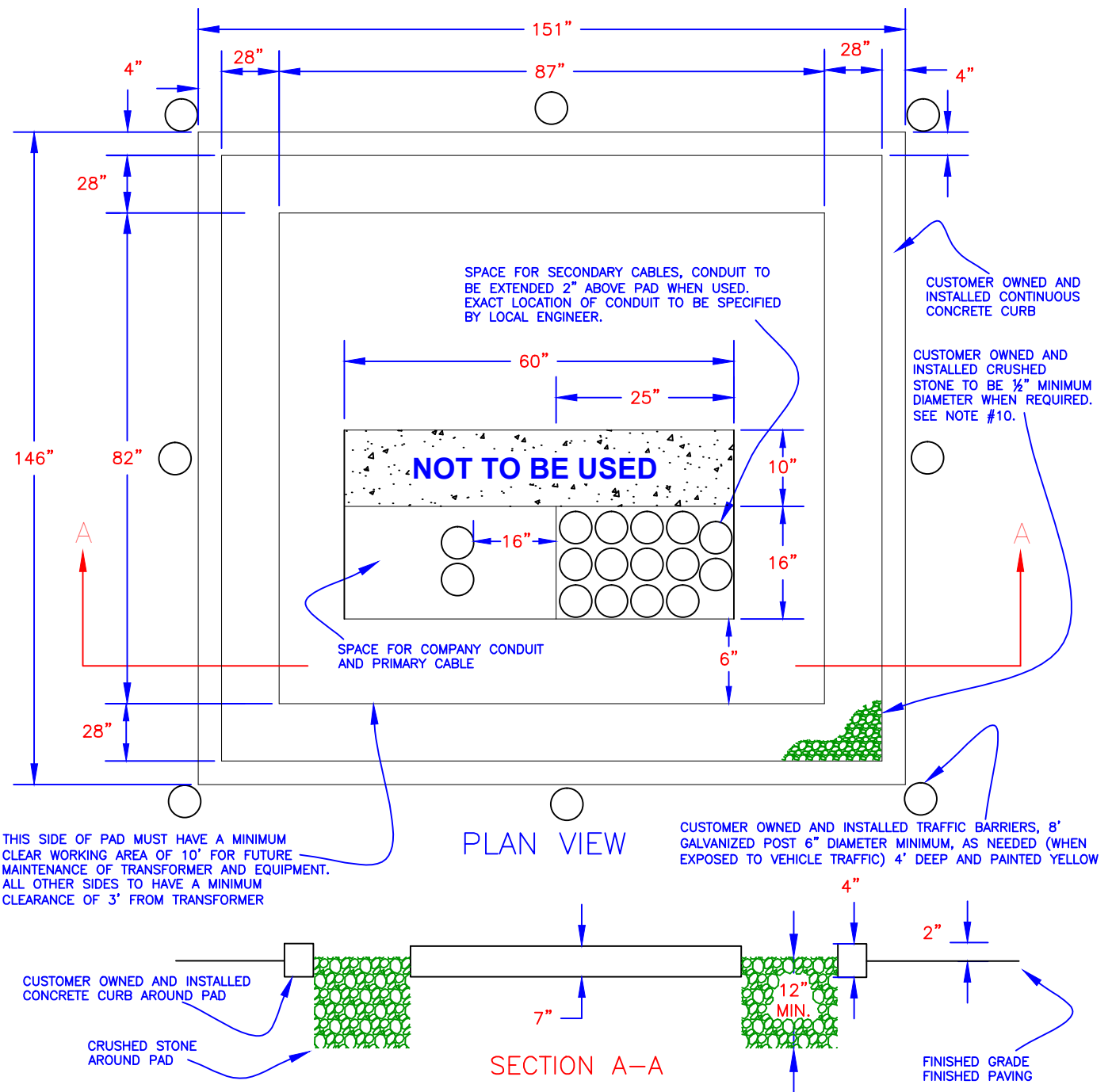
Figure 19A

## NOTES:

1. THE GROUND SHALL BE LEVELED AND THOROUGHLY COMPACTED BEFORE THE PAD IS INSTALLED.
2. THERE SHALL BE NO ABOVE GROUND OBSTRUCTIONS WITHIN 10 FEET OF THE FRONT OF THE TRANSFORMER OR WITHIN 3' OF THE SIDES AND BACK. IF METERING TROUGH IS LOCATED BEHIND TRANSFORMER, MINIMUM CLEARANCE BETWEEN BACK OF TRANSFORMER AND CLOSEST PART OF TROUGH IS 6 FEET.
3. THE PAD IS SHOWN AS A REFERENCE AND IS INSTALLED AFTER CABLE AND CONDUIT IS INSTALLED.
4. CUT ALL CONDUITS OFF FLUSH WITH TOP OF PAD AND CAP CONDUIT.
5. SOD MAY BE REQUIRED AROUND PAD TO PREVENT SAND EROSION.
6. SIDE VENTILATION SHALL BE PROVIDED IF THERE IS A WALL CONSTRUCTED AROUND THE TRANSFORMER.
7. IF THE CUSTOMER PLANS TO RUN A NUMBER OF CONDUCTORS BEYOND THE MAXIMUM ALLOWED, A JUNCTION BOX MAY BE REQUIRED FOR TERMINATION OF THE CUSTOMER'S CONDUCTORS.
8. LARGER SECONDARY CABLE SHALL BE TO THE REAR OF THE PAD WITH SPARE CONDUIT TO THE FRONT.
9. CONTACT A COMPANY ENGINEERING REPRESENTATIVE FOR DETERMINATION OF NEED FOR CRUSHED STONE, CURBING AND TRAFFIC BARRIERS. EXACT ORIENTATION OF THE TRANSFORMER IN THE FIELD MUST BE APPROVED BY A COMPANY ENGINEERING REPRESENTATIVE.
10. IN AREAS WHERE TRANSFORMERS ARE TO BE ELEVATED ABOVE NORMAL GRADE, ENGINEERING DEPARTMENT MUST BE CONTACTED FOR APPROVAL OF DESIGN.

## **PRECAST CONCRETE MOUNTING PAD CONSTRUCTION DETAILS FOR 75 TO 300 KVA, 3 PHASE PADMOUNTED TRANSFORMERS**

**Figure 19B**



## PRECAST CONCRETE MOUNTING PAD CONSTRUCTION DETAILS FOR 500 TO 3000 KVA, 3 PHASE PADMOUNTED TRANSFORMERS

Figure 20A

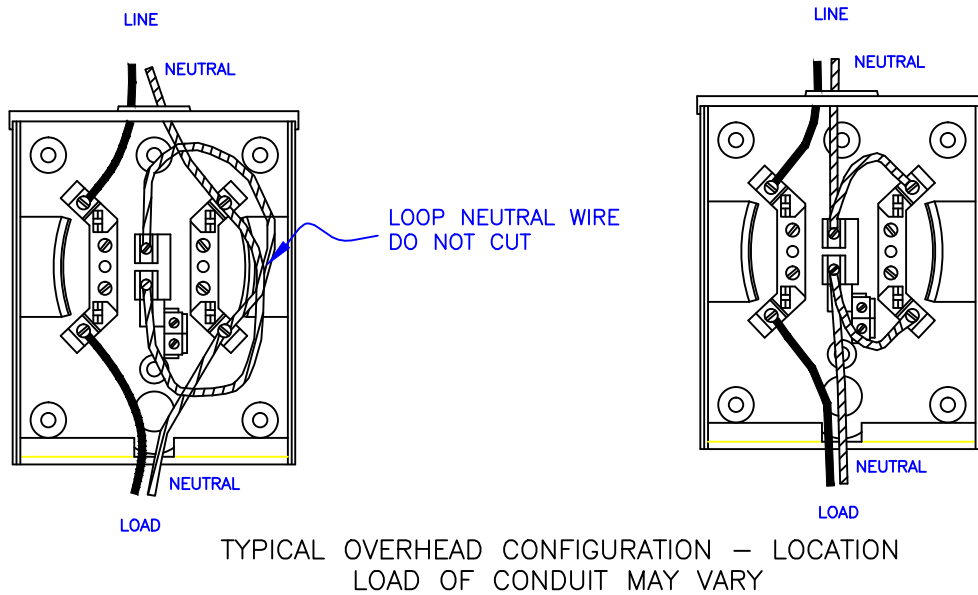
## NOTES:

1. THE GROUND SHALL BE LEVELED AND THOROUGHLY COMPACTED BEFORE THE PAD IS INSTALLED.
2. THERE SHALL BE NO ABOVE GROUND OBSTRUCTIONS WITHIN 10 FEET OF THE FRONT OF THE TRANSFORMER OR WITHIN 3' OF THE SIDES AND BACK. IF METERING TROUGH IS LOCATED BEHIND TRANSFORMER, MINIMUM CLEARANCE BETWEEN BACK OF TRANSFORMER AND CLOSEST PART OF TROUGH IS 6 FEET.
3. THE PAD IS SHOWN AS A REFERENCE AND IS INSTALLED AFTER CABLE AND CONDUIT IS INSTALLED.
4. CUT ALL CONDUITS OFF FLUSH WITH TOP OF PAD AND CAP CONDUIT.
5. SOD MAY BE REQUIRED AROUND PAD TO PREVENT SAND EROSION.
6. SIDE VENTILATION SHALL BE PROVIDED IF THERE IS A WALL CONSTRUCTED AROUND THE TRANSFORMER.
7. IF THE CUSTOMER PLANS TO RUN A NUMBER OF CONDUCTORS BEYOND THE MAXIMUM ALLOWED, A JUNCTION BOX MAY BE REQUIRED FOR TERMINATION OF THE CUSTOMER'S CONDUCTORS.
8. LARGER SECONDARY CABLE SHALL BE TO THE REAR OF THE PAD WITH SPARE CONDUIT TO THE FRONT.
9. CONTACT A COMPANY ENGINEERING REPRESENTATIVE FOR DETERMINATION OF NEED FOR CRUSHED STONE, CURBING AND TRAFFIC BARRIERS. EXACT ORIENTATION OF THE TRANSFORMER IN THE FIELD MUST BE APPROVED BY A COMPANY ENGINEERING REPRESENTATIVE.
10. IN AREAS WHERE TRANSFORMERS ARE TO BE ELEVATED ABOVE NORMAL GRADE, ENGINEERING DEPARTMENT MUST BE CONTACTED TO FOR APPROVAL OF DESIGN.

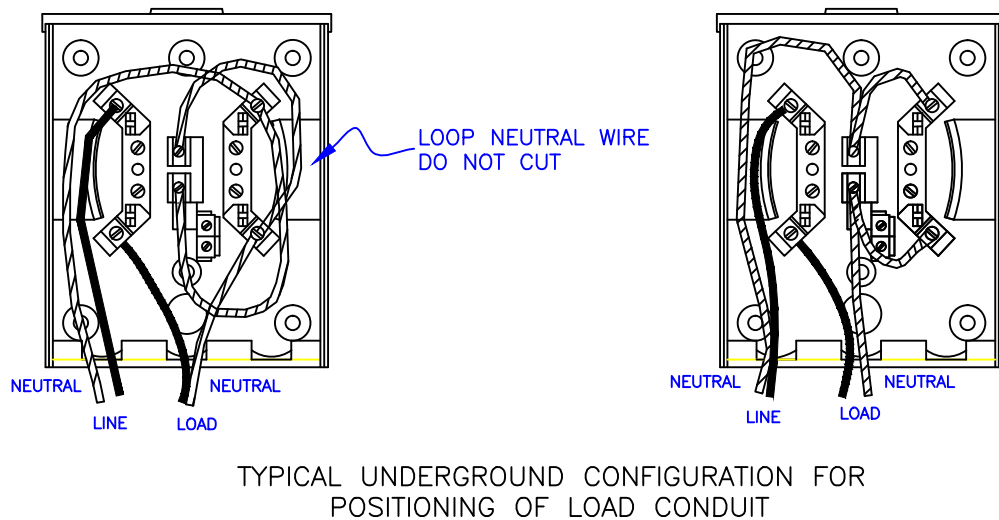
## **PRECAST CONCRETE MOUNTING PAD CONSTRUCTION DETAILS FOR 500 TO 3000 KVA, 3 PHASE PADMOUNTED TRANSFORMERS**

**Figure 20B**

**Figure 21**



**Figure 22**



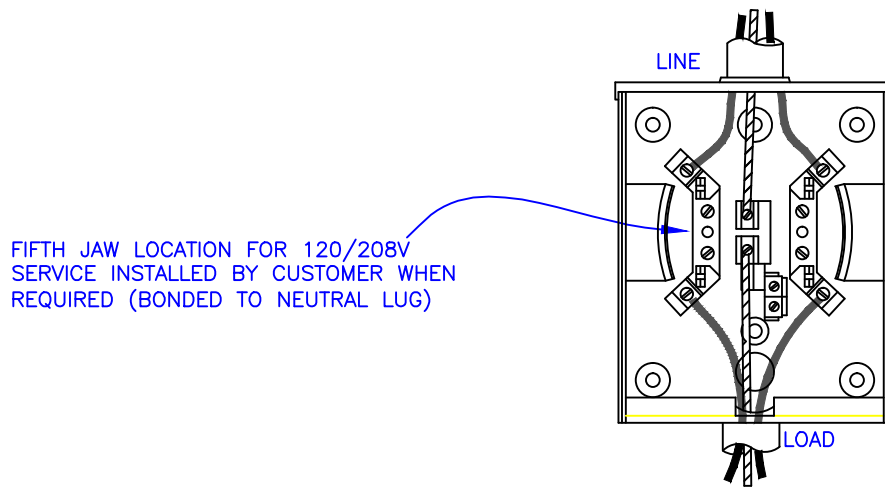
NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
3. MINIMUM WIRE SIZE #6.

**120V, SINGLE PHASE, 2 WIRE METER ENCLOSURE  
FOR OVERHEAD AND UNDERGROUND SERVICE**

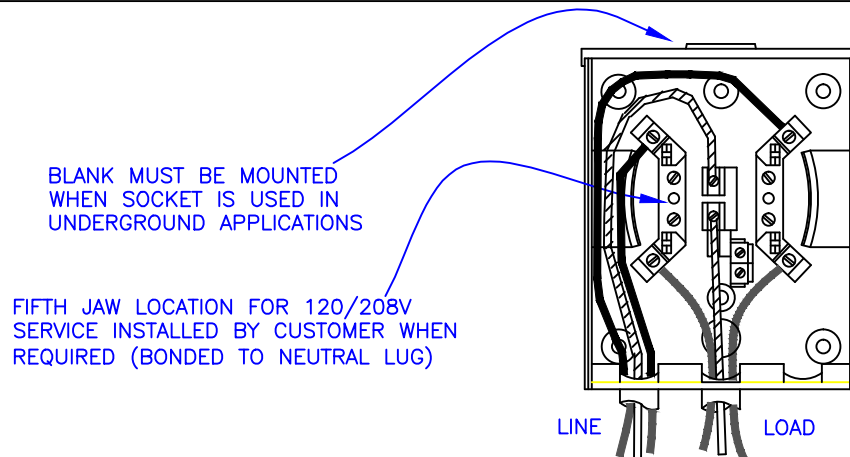
**Figures 21 - 22**

**Figure 23**



TYPICAL OVERHEAD CONFIGURATION – LOCATION OF LOAD CONDUIT MAY VARY

**Figure 24**



TYPICAL UNDERGROUND CONFIGURATION FOR POSITIONING OF LOAD CONDUIT – REFERENCE FIGURE 36

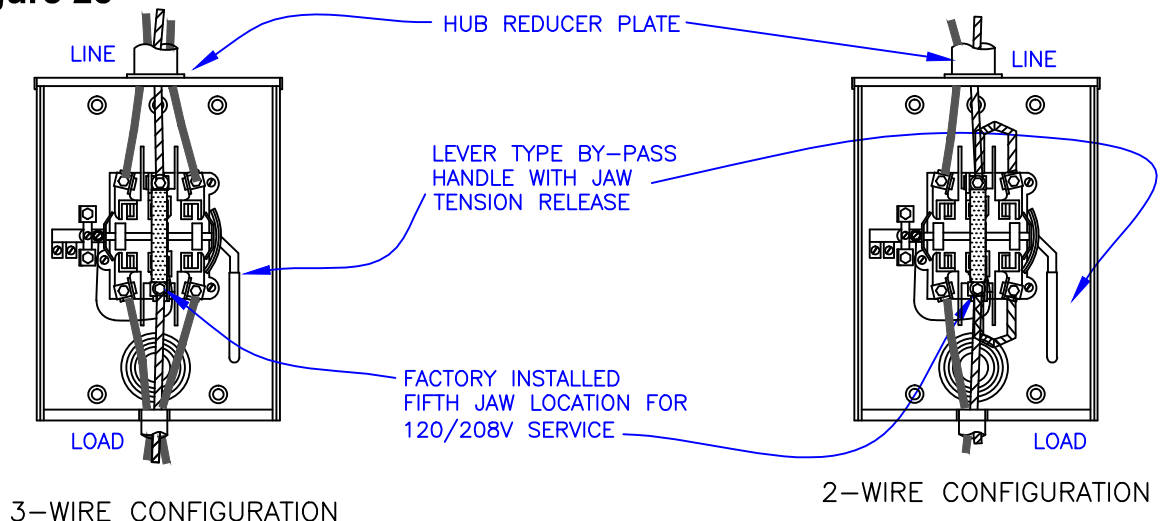
NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
3. MINIMUM WIRE SIZE #6.

**TYPICAL RESIDENTIAL 120/240V, 120/208V SINGLE PHASE, 3 WIRE  
METER ENCLOSURE INSTALLATION**

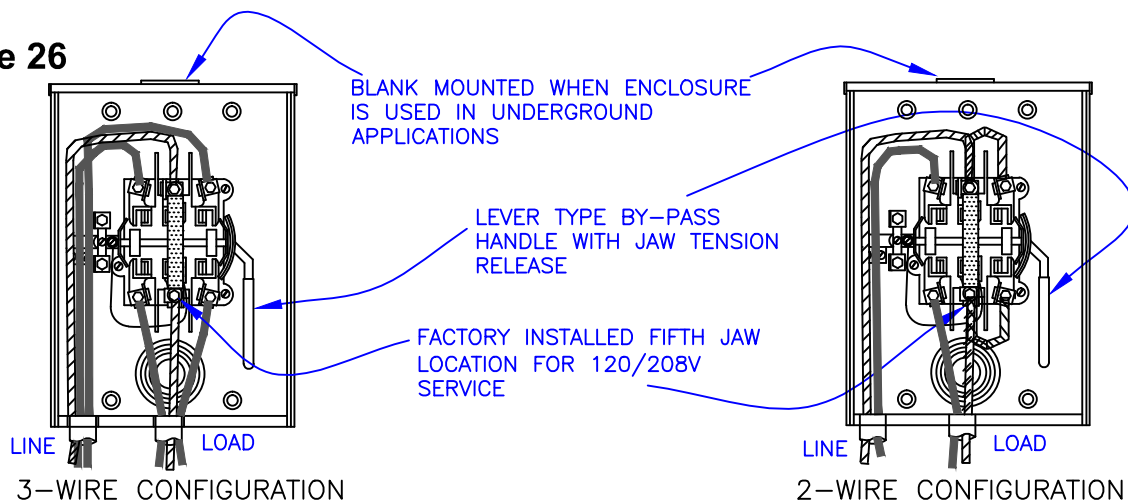
**Figures 23 - 24**

**Figure 25**



TYPICAL OVERHEAD CONFIGURATION – LOCATION OF LOAD CONDUIT MAY VARY

**Figure 26**



TYPICAL UNDERGROUND CONFIGURATION FOR POSITIONING OF LOAD  
CONDUIT – REFERENCE FIGURE 36

NOTES:

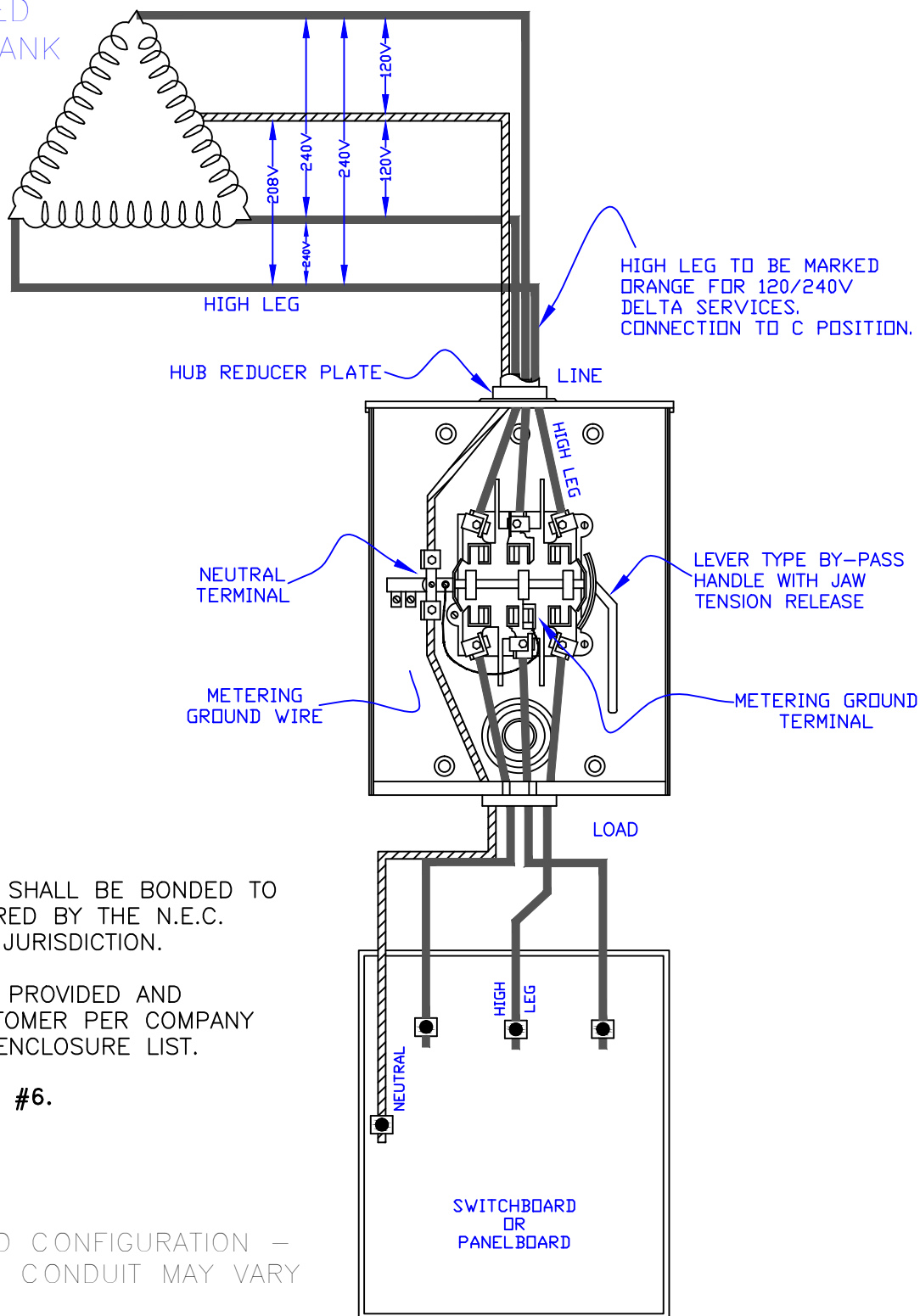
1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
3. WHEN USING THIS ENCLOSURE ON ANY VOLTAGE ABOVE 240V, A NON-AUTOMATIC DISCONNECT DEVICE MUST BE USED. SEE SECTION IV-A(3) FOR FURTHER EXPLANATION.
4. MINIMUM WIRE SIZE #6.

**TYPICAL 5-JAW, SINGLE PHASE, 3 WIRE METER ENCLOSURE FOR  
COMMERCIAL SERVICE - 120/240V, 120/208V, 120V, 240/480V, 240/480, 480V**

**Figures 25 - 26**



## DELTA CONNECTED TRANSFORMER BANK



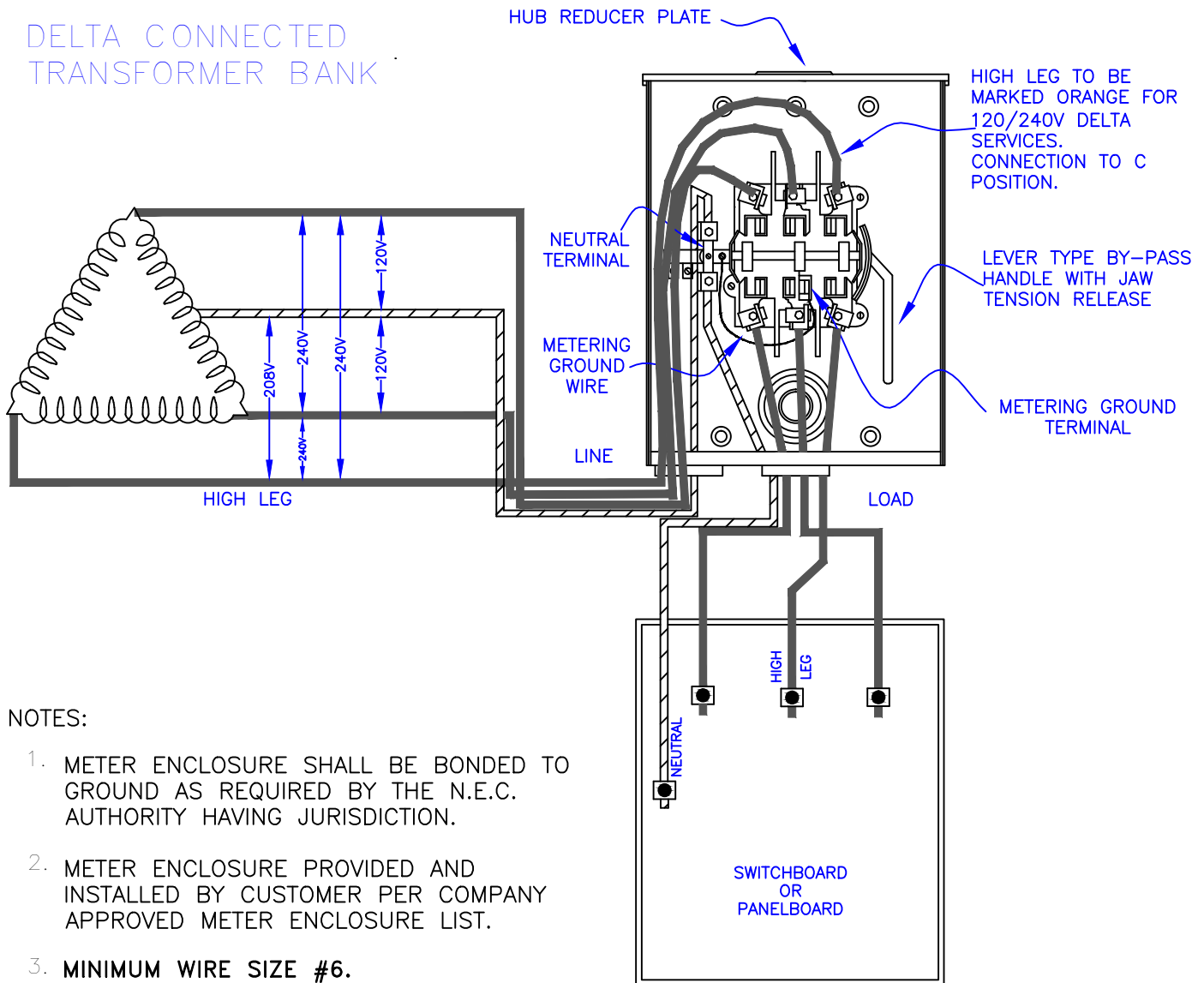
### NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
3. MINIMUM WIRE SIZE #6.

TYPICAL OVERHEAD CONFIGURATION –  
LOCATION OF LOAD CONDUIT MAY VARY

## TYPICAL 7-JAW, THREE PHASE, 4 WIRE METER ENCLOSURE FOR COMMERCIAL SERVICE - 120/240V

Figure 27A

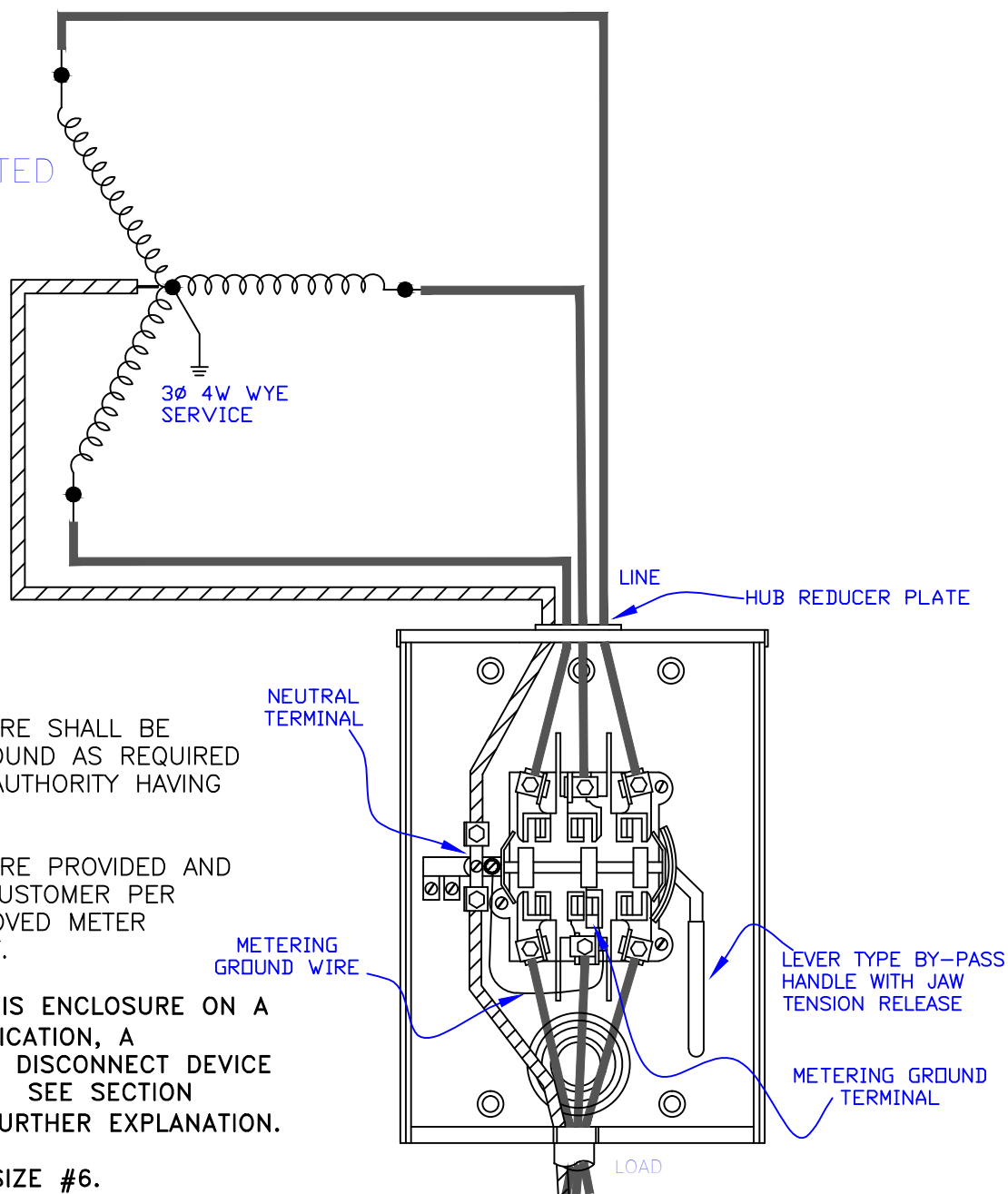


TYPICAL UNDERGROUND CONFIGURATION FOR POSITIONING OF LOAD CONDUIT — REFERENCE FIGURE 36

### TYPICAL 7-JAW, THREE PHASE, 4 WIRE METER ENCLOSURE FOR COMMERCIAL SERVICE - 120/240V

Figure 27B

WYE CONNECTED  
TRANSFORMER  
BANK



NOTES:

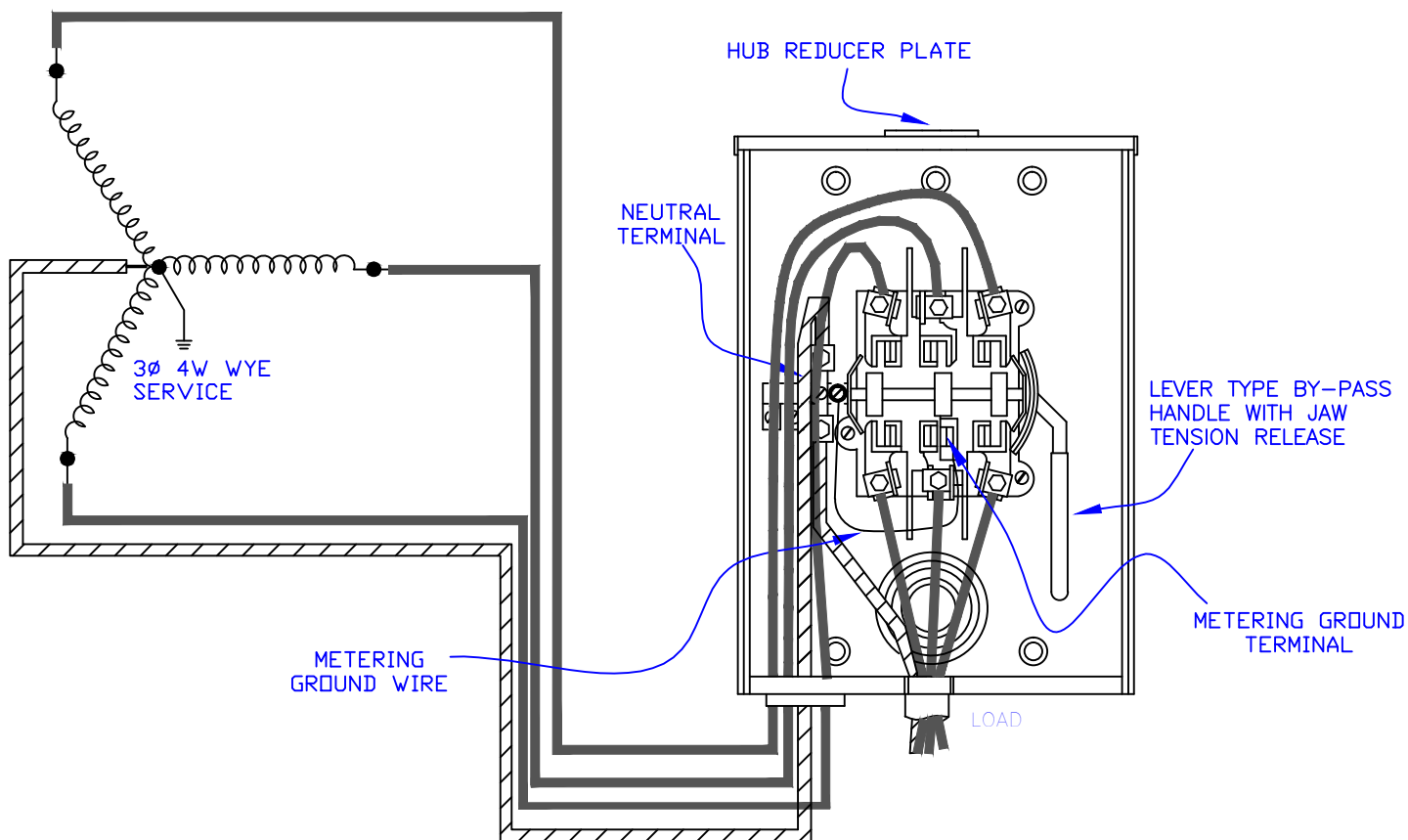
1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
3. WHEN USING THIS ENCLOSURE ON A 277/480V APPLICATION, A NON-AUTOMATIC DISCONNECT DEVICE MUST BE USED. SEE SECTION IV-A(3c) FOR FURTHER EXPLANATION.
4. MINIMUM WIRE SIZE #6.

TYPICAL OVERHEAD CONFIGURATION — LOCATION OF LOAD  
CONDUIT MAY VARY

**TYPICAL 7-JAW, THREE PHASE, 4 WIRE METER ENCLOSURE  
FOR OVERHEAD COMMERCIAL SERVICE - 120/208V, 277/480V**

**Figure 28A**

# WYE CONNECTED TRANSFORMER BANK



TYPICAL UNDERGROUND CONFIGURATION FOR POSITIONING  
OF LOAD CONDUIT — REFERENCE FIGURE 36

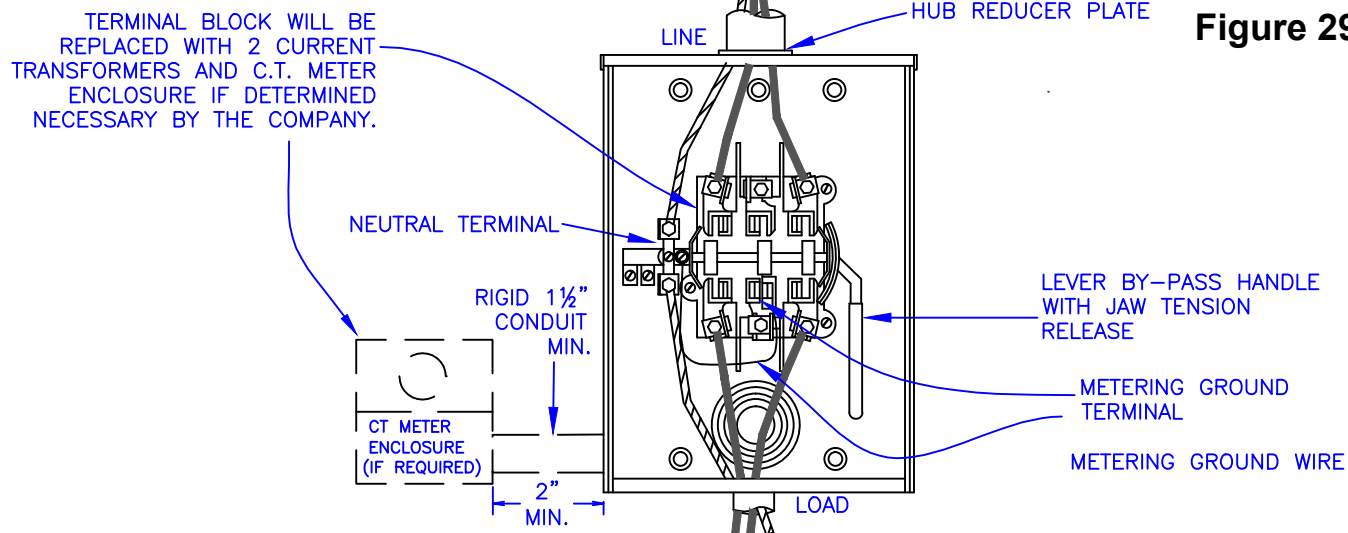
## NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.
3. WHEN USING THIS ENCLOSURE ON A 277/480V APPLICATION, A NON-AUTOMATIC DISCONNECT DEVICE MUST BE USED. SEE SECTION IV-A(3c) FOR FURTHER EXPLANATION.
4. MINIMUM WIRE SIZE #6.

## TYPICAL 7-JAW, THREE PHASE, 4 WIRE METER ENCLOSURE FOR UNDERGROUND COMMERCIAL SERVICE - 120/208V, 277/480V

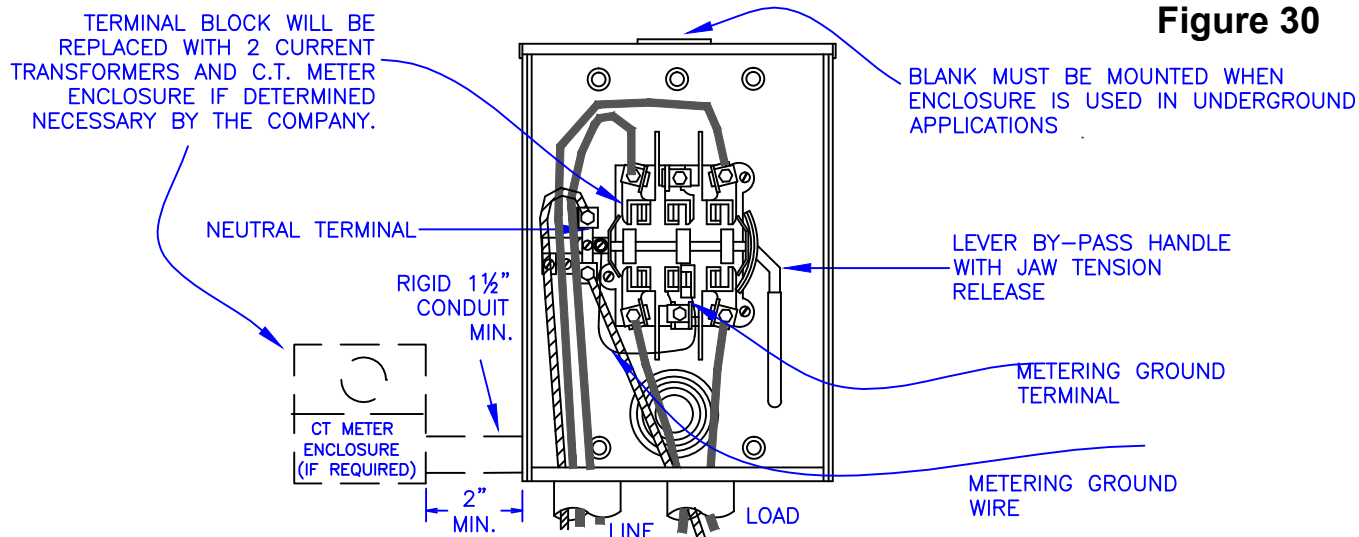
Figure 28B

**Figure 29**



TYPICAL OVERHEAD CONFIGURATION – LOCATION OF LOAD CONDUIT MAY VARY

**Figure 30**



TYPICAL UNDERGROUND CONFIGURATION FOR POSITIONING OF LOAD CONDUIT – REFERENCE FIGURE 36

NOTES:

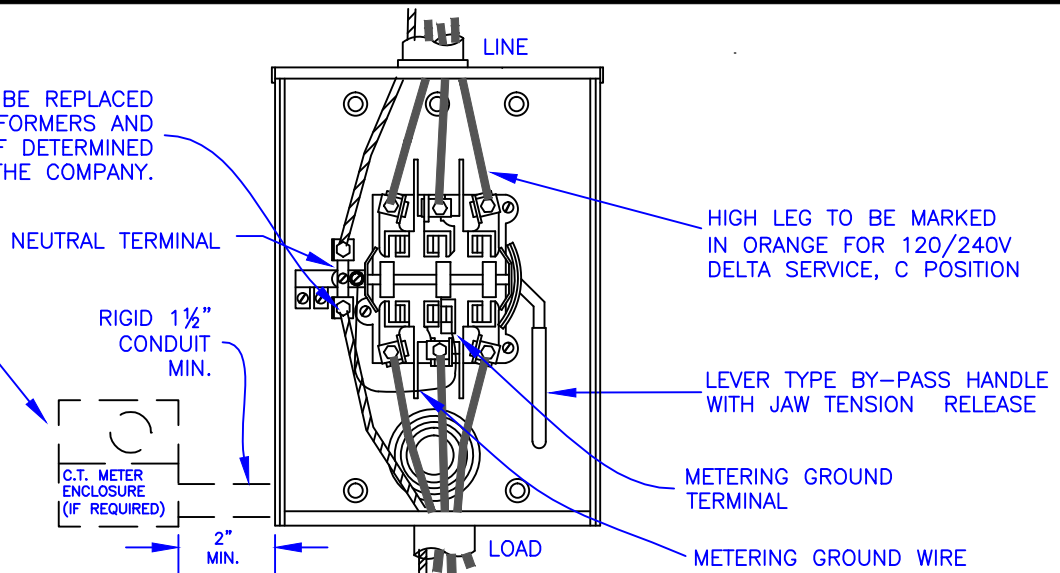
1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**TYPICAL SINGLE PHASE CONVERTIBLE METER ENCLOSURE  
CT CABINET FOR COMMERCIAL SERVICE**

**Figures 29 - 30**

**Figure 31**

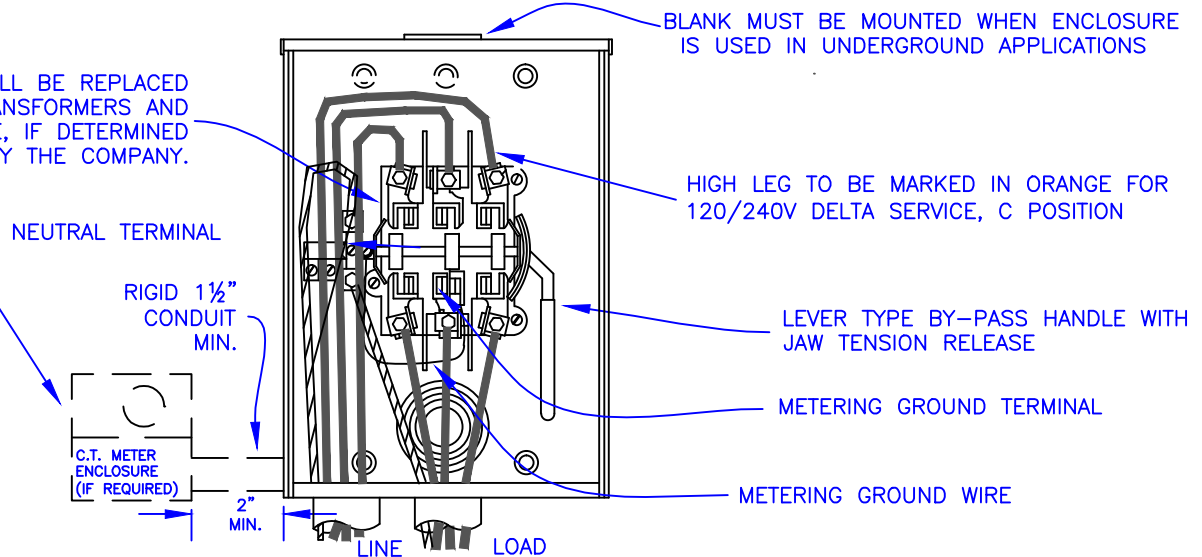
TERMINAL BLOCK WILL BE REPLACED WITH 3 CURRENT TRANSFORMERS AND C.T. METER ENCLOSURE, IF DETERMINED NECESSARY BY THE COMPANY.



TYPICAL OVERHEAD CONFIGURATION – LOCATION OF LOAD CONDUIT MAY VARY

**Figure 32**

TERMINAL BLOCK WILL BE REPLACED WITH 3 CURRENT TRANSFORMERS AND C.T. METER ENCLOSURE, IF DETERMINED NECESSARY BY THE COMPANY.



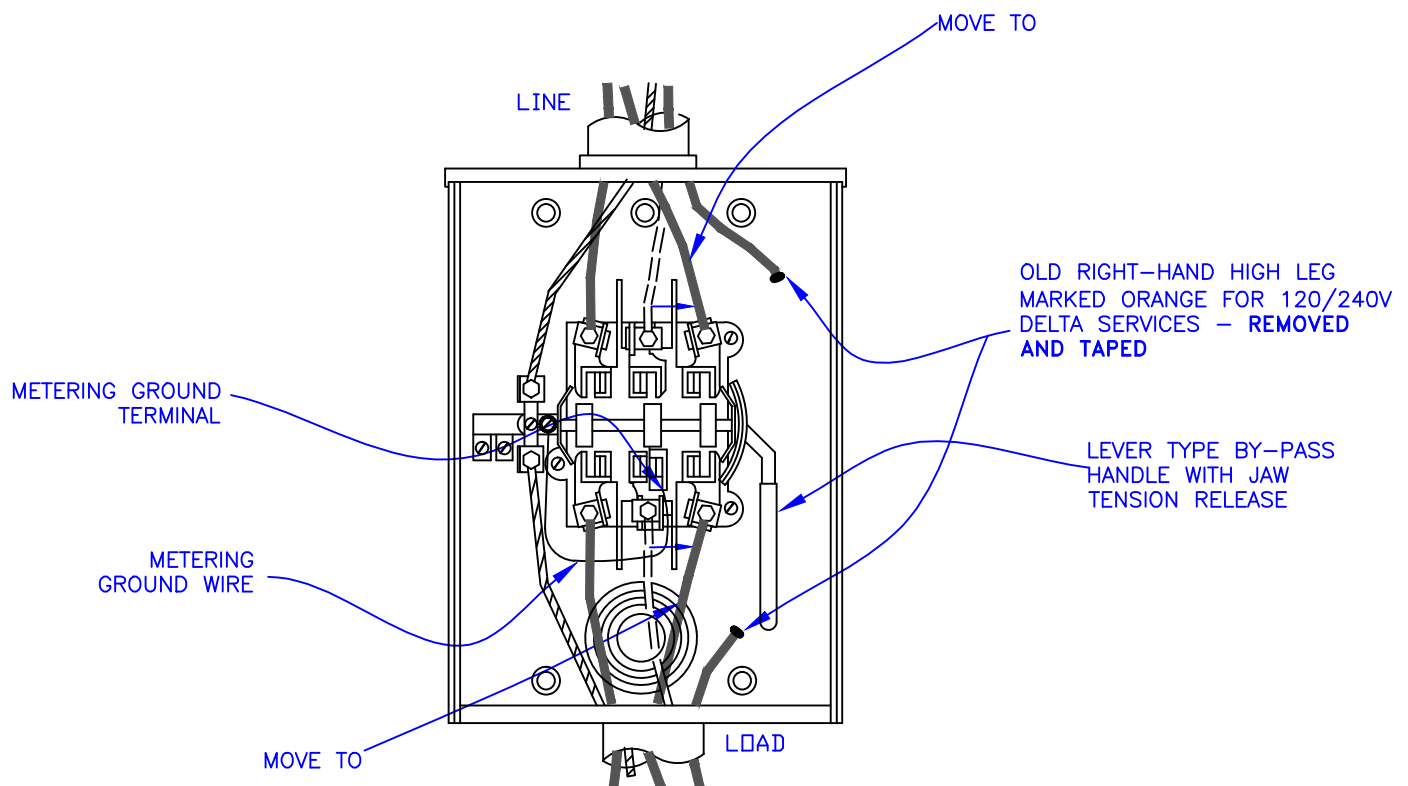
TYPICAL UNDERGROUND CONFIGURATION FOR POSITIONING OF LOAD CONDUIT – REFERENCE FIGURE 36

NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**TYPICAL THREE PHASE, 4 WIRE, CONVERTIBLE  
METER ENCLOSURE \ C.T. CABINET**

**Figures 31 - 32**



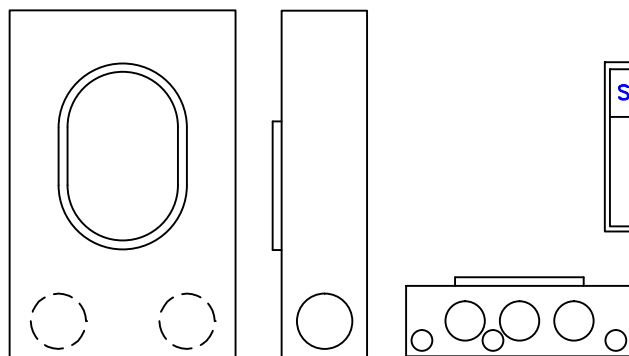
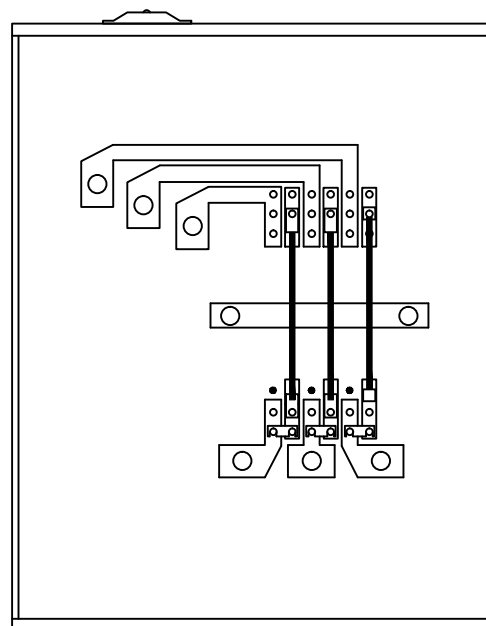
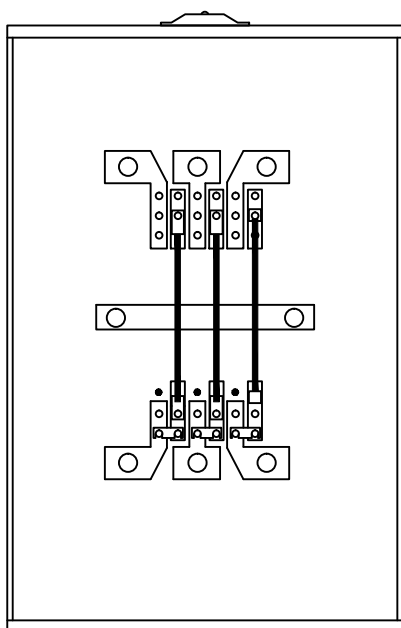
NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. LOCATION OF LOAD CONDUIT MAY VARY.
3. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**CONVERSION FROM THREE PHASE, 4 WIRE DELTA  
TO SINGLE PHASE, 3 WIRE SERVICE**

**Figure 33**

EXISTING INSTALLATIONS ONLY  
NO LONGER USED WITH CURRENT APPLICATIONS



TYPICAL CONDUIT KNOCKOUT LOCATIONS

SOCKET RATING	WIRE SIZES	HUB SIZES (IN.)
600 AMP	STUD-TYPE 250-800 KCM OR PARALLEL 500 KCM	3, 3½, 4 BLANK

NOTES:

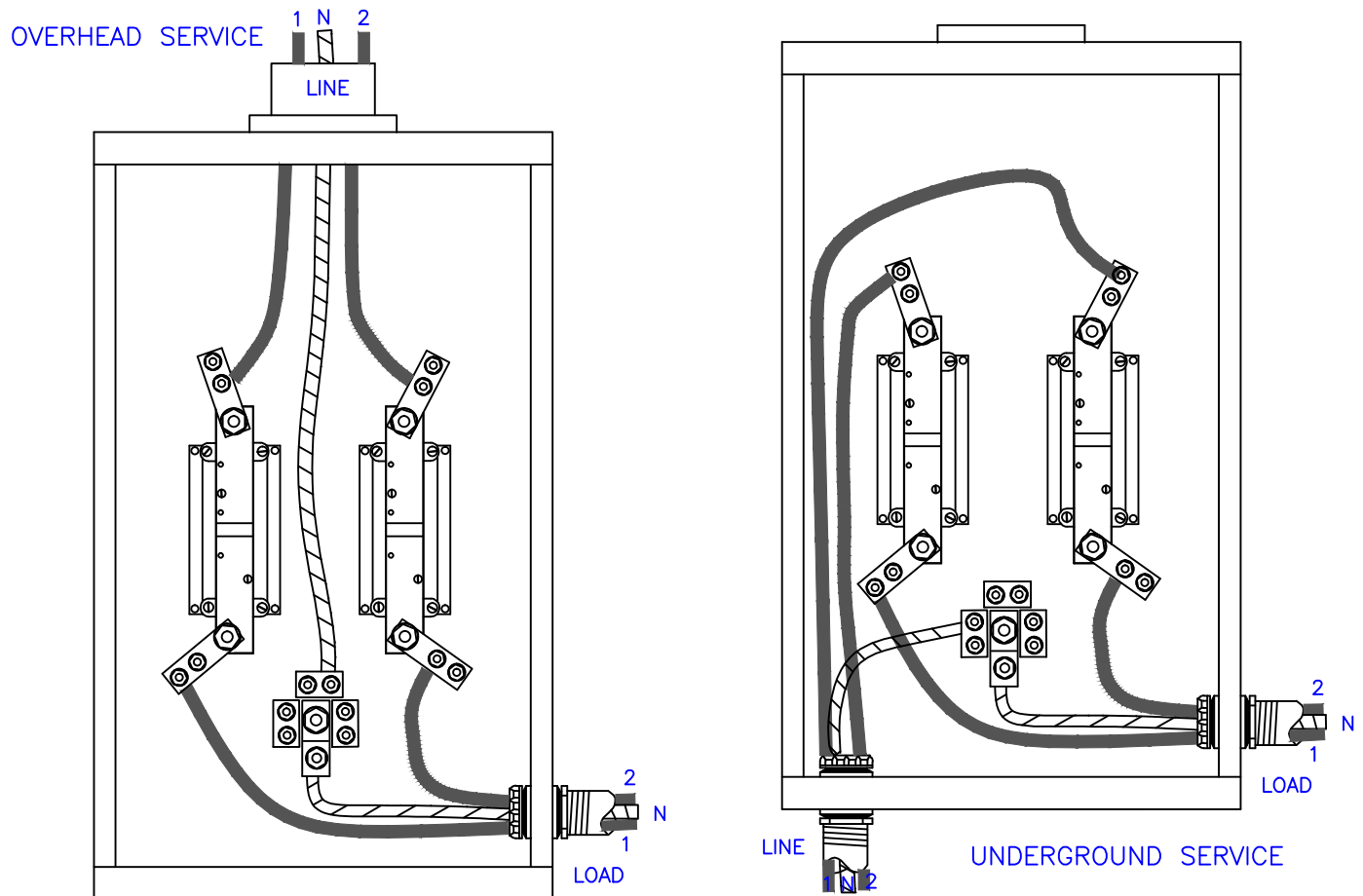
1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. AUTHORITY HAVING JURISDICTION.
2. LOCATION OF LINE AND LOAD CONDUIT MAY VARY.
3. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**K7 600 AMP THREE PHASE OVERHEAD OR UNDERGROUND,  
4 WIRE METER ENCLOSURE FOR COMMERCIAL SERVICE**

**Figure 34**



**EXISTING INSTALLATIONS ONLY**  
**NO LONGER USED WITH CURRENT APPLICATIONS**



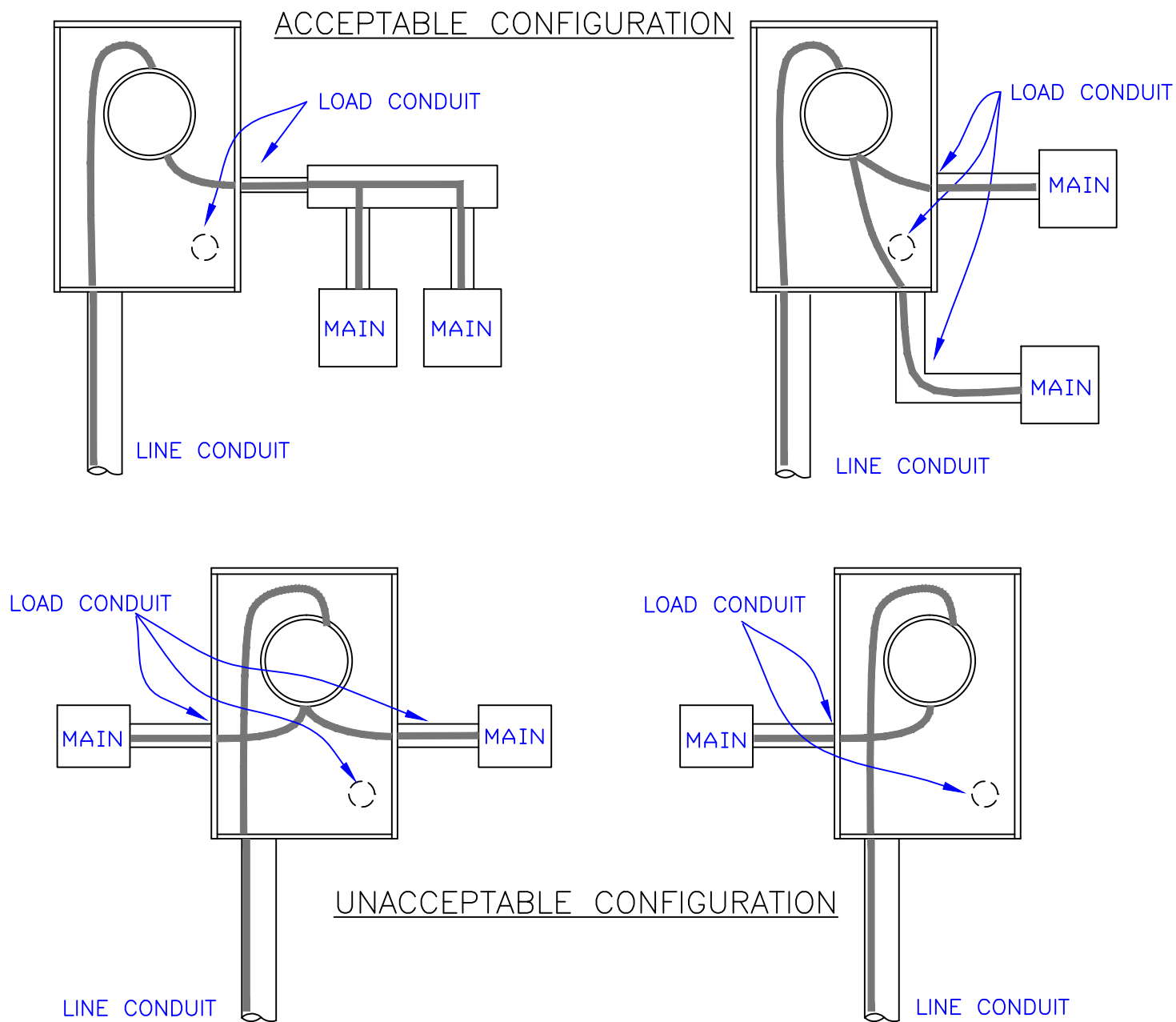
SOCKET RATING	WIRE SIZES	HUB SIZES (IN.)
600 AMP	STUD-TYPE 250-800 KCM OR PARALLEL 500 KCM	3, 3½, 4 BLANK

NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. LOCATION OF LINE AND LOAD CONDUIT MAY VARY.
3. METER ENCLOSURE PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**K-BASE 600 AMP SINGLE-PHASE OVERHEAD  
OR UNDERGROUND, 3 WIRE METER SOCKET**

**Figure 35**

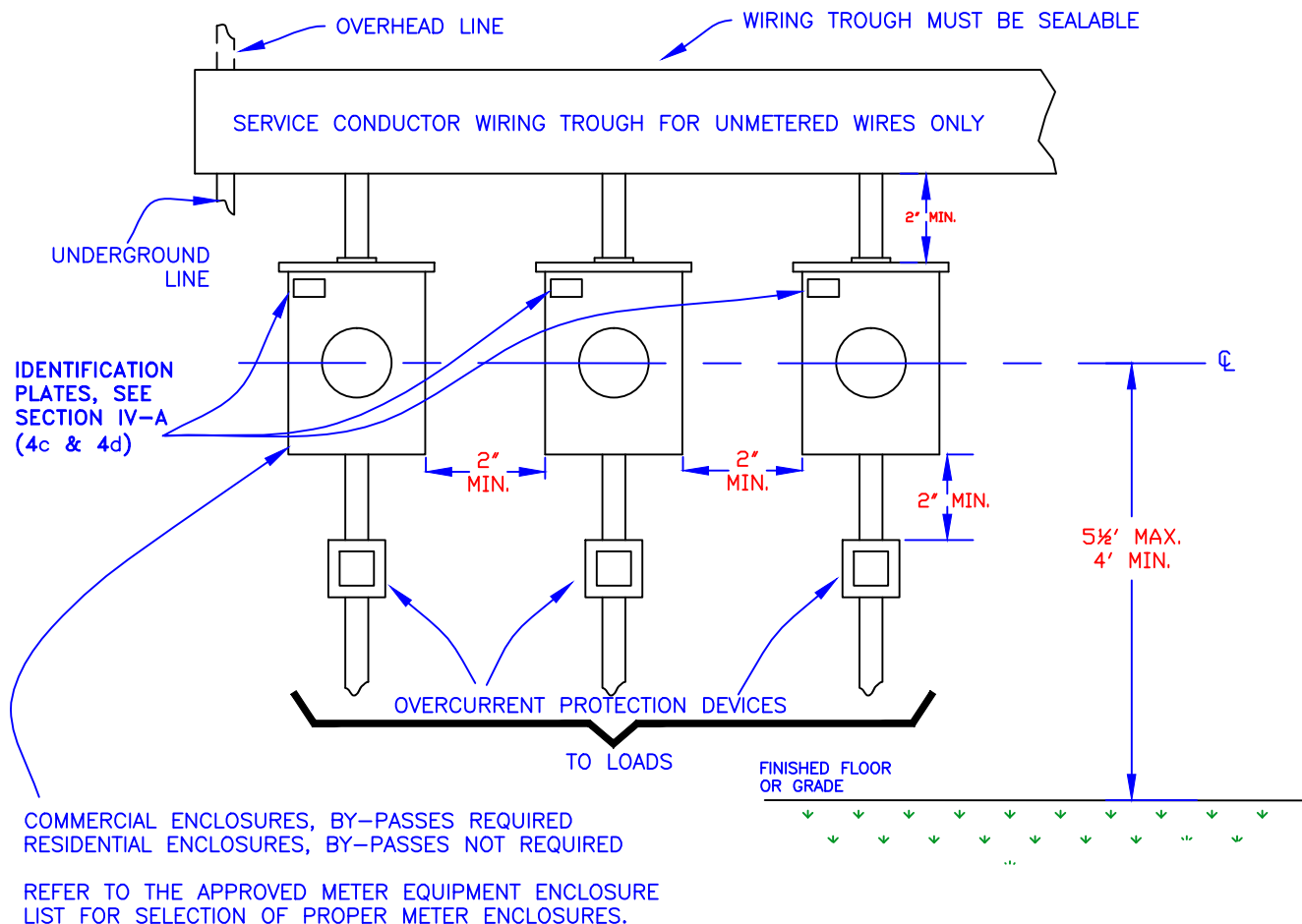


NOTES:

1. THE LOWER LEFT PORTION OF THE METER ENCLOSURE IS RESERVED FOR LINE SIDE CONDUCTORS ON UNDERGROUND SERVICES.

**UNDERGROUND CONFIGURATIONS FOR BYPASS  
METER ENCLOSURES**

**Figure 36**

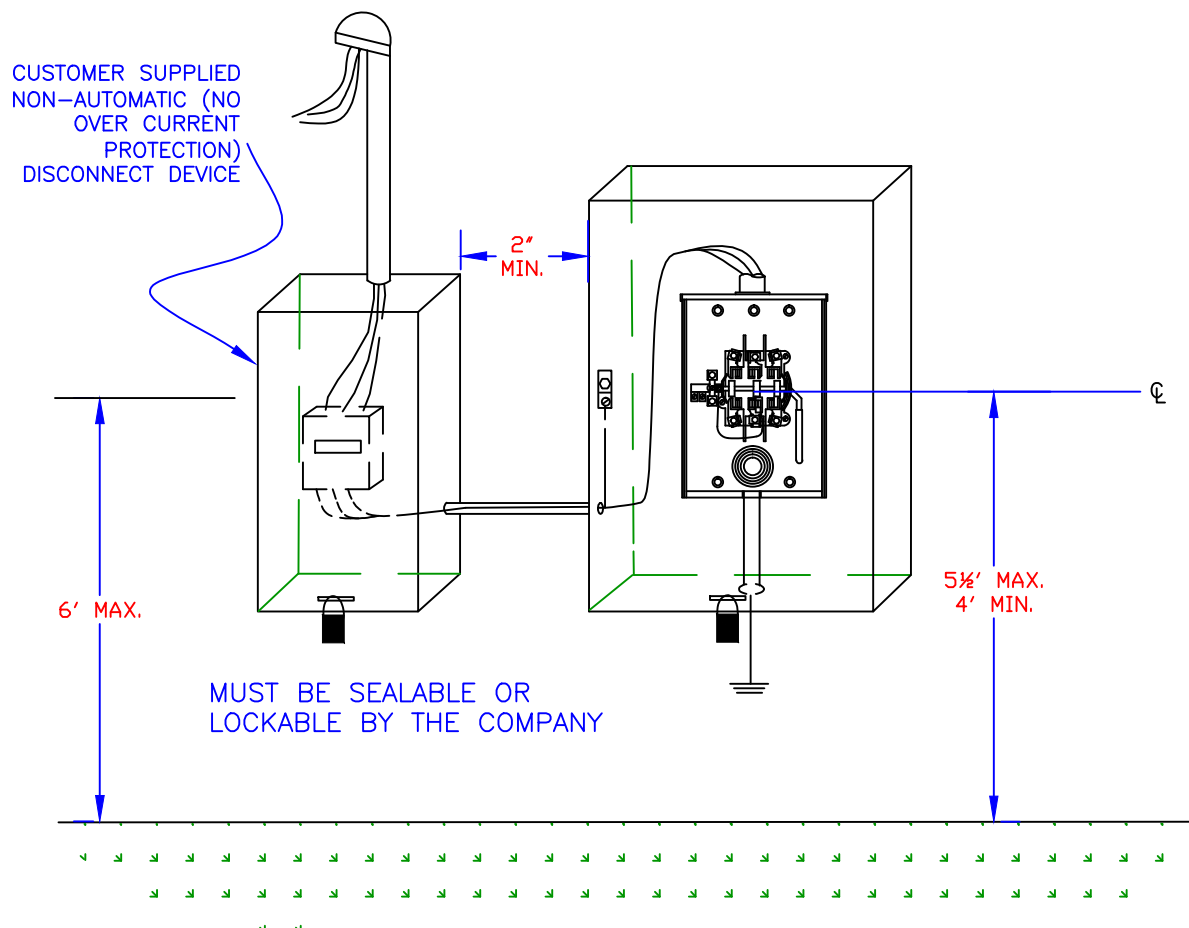


NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. FOR OUTSIDE USE, TROUGH MUST BE WEATHER-RESISTANT (CUSTOMER SUPPLIED).
3. METER ENCLOSURES MAY BE LOCATED ABOVE OR BELOW WIRING TROUGH BUT NOT BOTH.
4. METER ENCLOSURES PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**TYPICAL GROUP METERING INSTALLATION USING  
SINGLE METER ENCLOSURES WITHOUT MAIN**

**Figure 37**

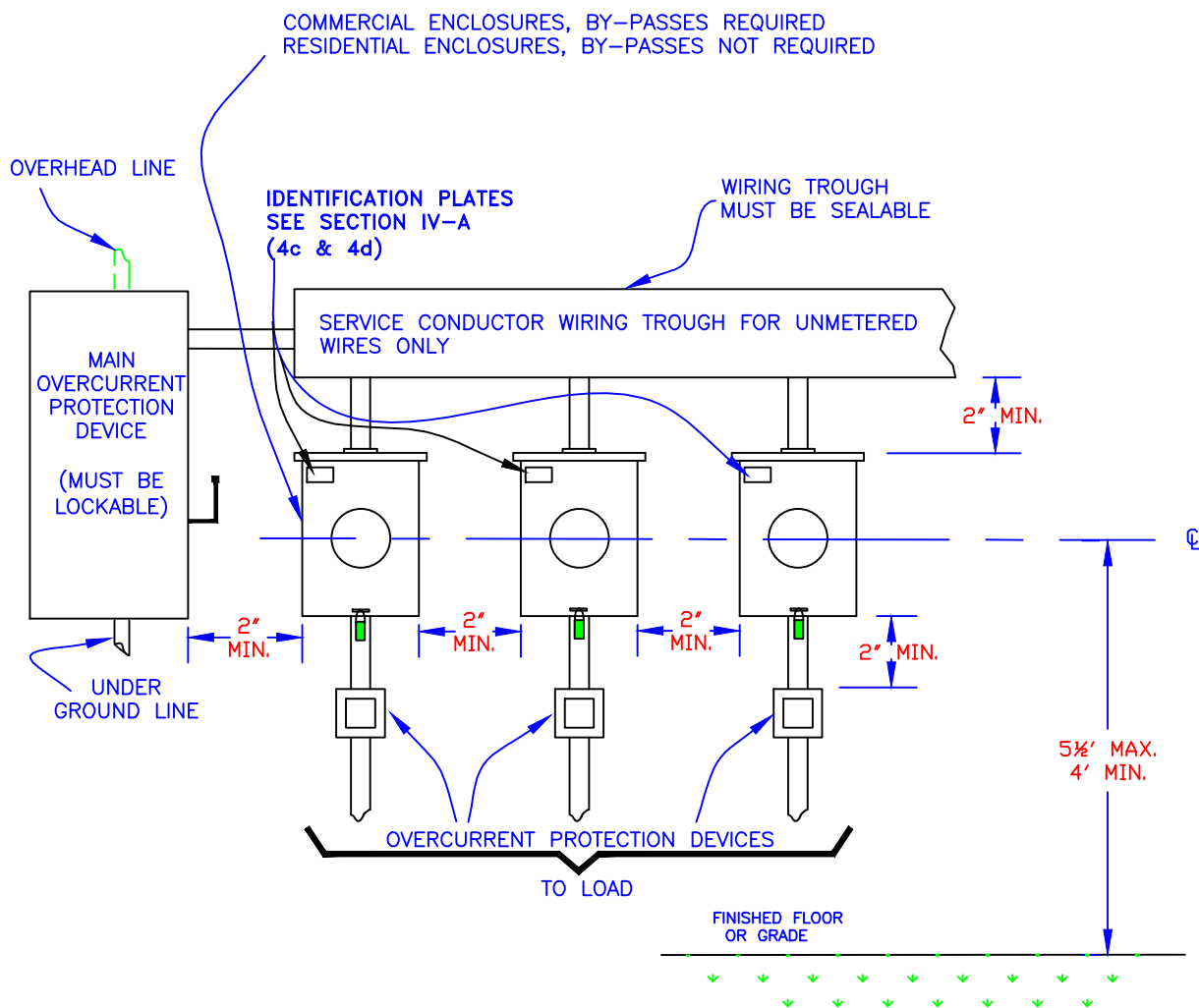


NOTES:

1. METER ENCLOSURE AND DISCONNECT DEVICE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. DEVICE MUST EQUAL OR EXCEED THE CUSTOMER'S MAIN CAPACITY.

**TYPICAL 240/480V, 277/480V, 480V TO GROUND  
SELF-CONTAINED SERVICE, 400 AMPS OR LESS,  
WITH NON-AUTOMATIC DISCONNECT DEVICE**

**Figure 38**

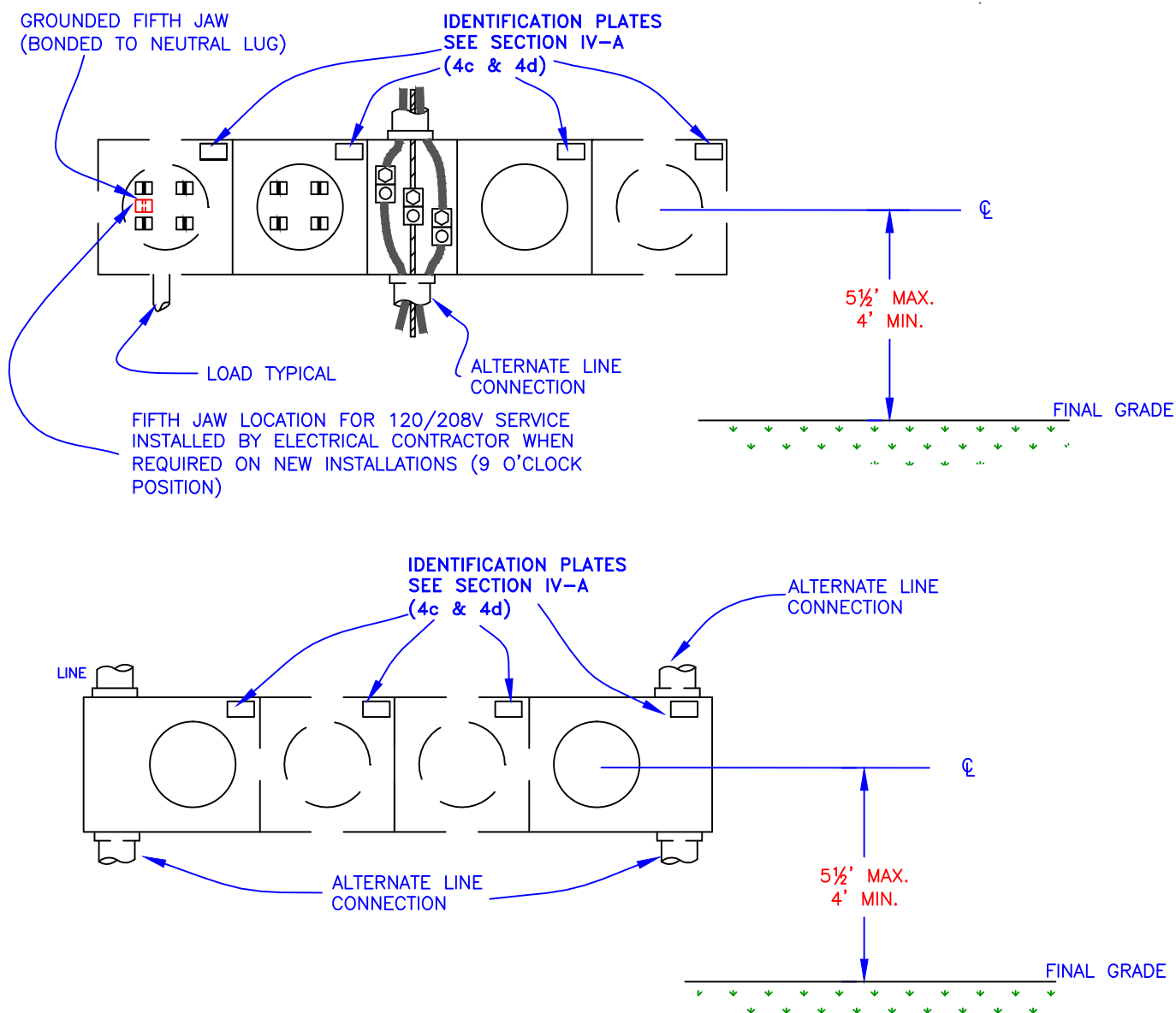


NOTES:

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. FOR OUTSIDE USE, TROUGH MUST BE WEATHER-RESISTANT (CUSTOMER SUPPLIED).
3. METER ENCLOSURES MAY BE LOCATED ABOVE OR BELOW WIRING TROUGH BUT NOT BOTH.
4. METER ENCLOSURES PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**TYPICAL GROUP METERING INSTALLATION  
USING SINGLE METER ENCLOSURES WITH MAIN**

**Figure 39**



NOTES:

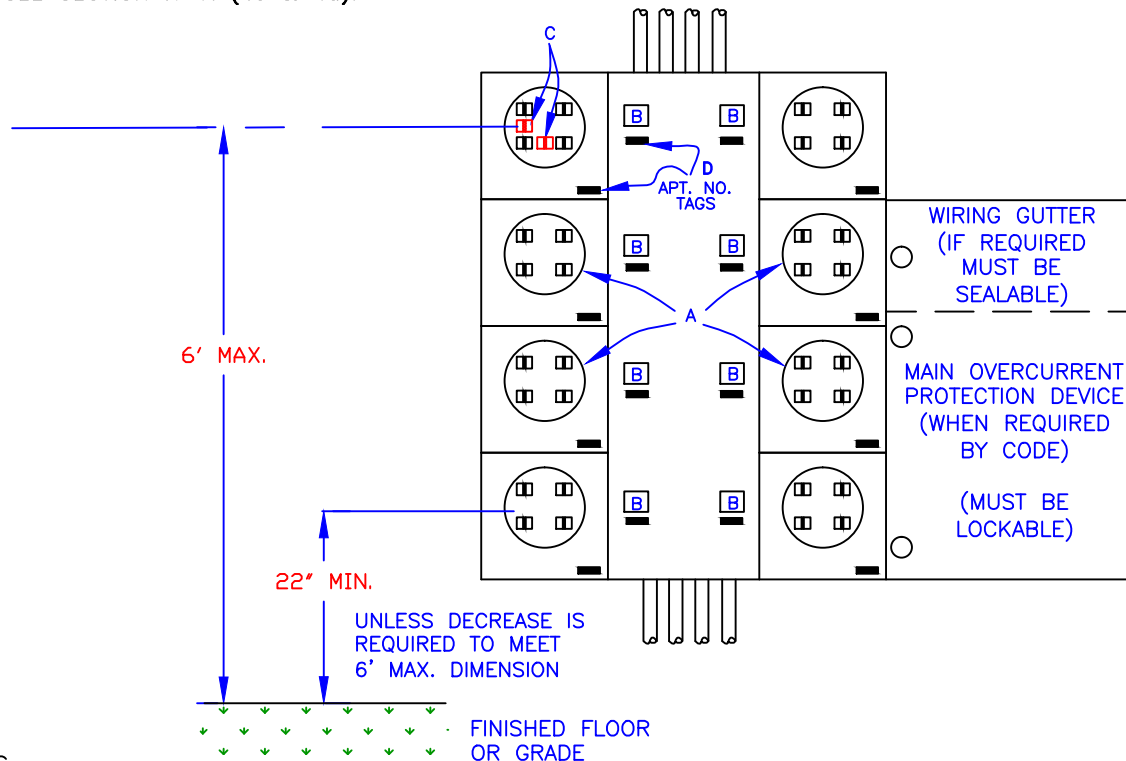
1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. COMMERCIAL INSTALLATION REQUIRE HEAVY DUTY JAW-TENSION RELEASE LEVER TYPE BY-PASS SOCKETS.
3. METER ENCLOSURES PROVIDED AND INSTALLED BY CUSTOMER PER COMPANY APPROVED METER ENCLOSURE LIST.

**TYPICAL RESIDENTIAL SINGLE PHASE, 3-WIRE  
2, 4 AND 6 GANG CENTER OR END FEED ENCLOSURE**

**Figure 40**

REFERENCE LETTERS TO PARTS ON DRAWING:

- A. INDIVIDUAL SOCKET FACE, ONE FOR EACH METER OPENING.
- B. COMMON TRIP LOAD BREAKER FOR EACH APARTMENT. BREAKERS SHALL BE ON THE LOAD SIDE OF METER ENCLOSURE.
- C. GROUNDED FIFTH TERMINAL TO BE PROVIDED WHEN USED ON 120/208 VOLT SINGLE PHASE AND IS ACCEPTABLE IN EITHER THE 6 OR 9 O'CLOCK POSITION AS SHOWN. (9 O'CLOCK POSITION PREFERRED) IDENTIFICATION TAG MUST BE PLACED ON BOTH METER COVERS AND BREAKER FACE PLATES.
- D. SEE SECTION IV-A (4c & 4d).



NOTES:

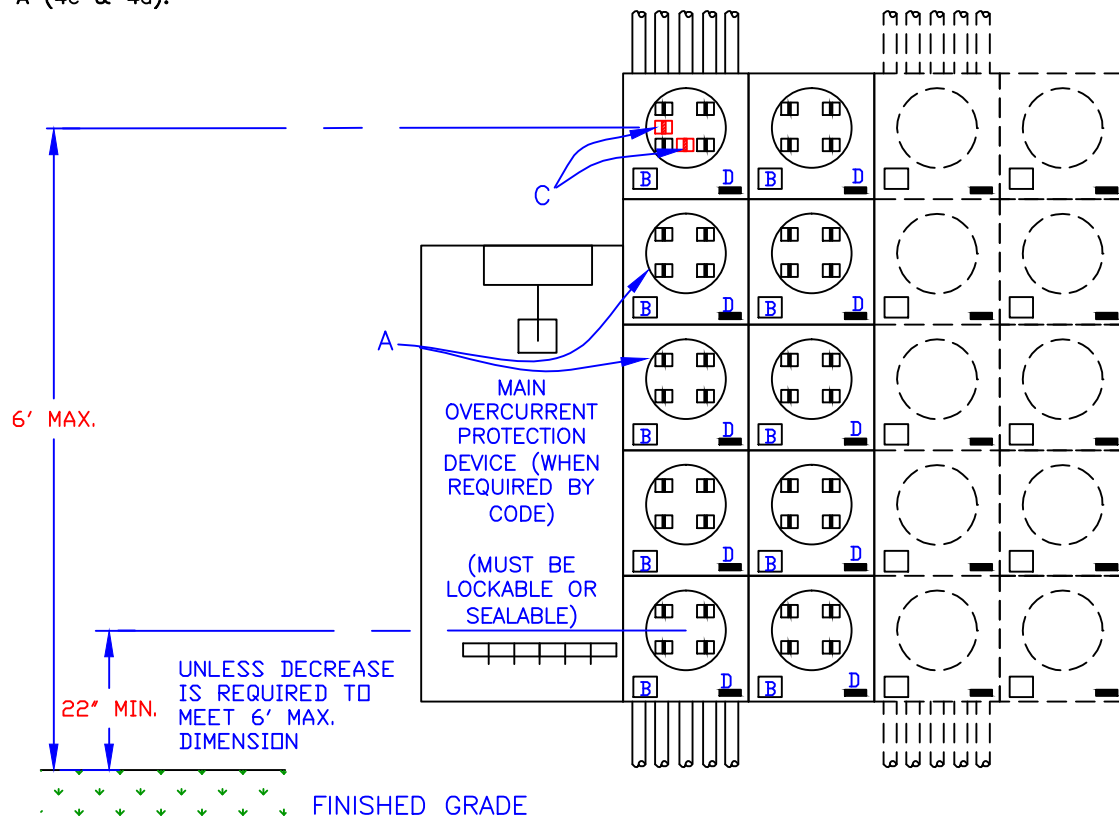
1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. ALL COMPONENTS AND RACEWAYS AHEAD OF METERS SHALL BE SEALABLE. METER CENTER SHALL BE SUPPLIED AND MAINTAINED BY CUSTOMER.
3. METER CENTER MUST COMPLY WITH REQUIREMENTS OF SECTION IV-B(2).
4. METER CENTER SHALL BE SUPPLIED AND MAINTAINED BY CUSTOMER.
5. COMMERCIAL GROUPED METER CENTERS MUST HAVE HEAVY-DUTY JAW TENSION RELEASE LEVER TYPE BY-PASS SOCKETS.
6. METER CENTERS MUST BE APPROVED BY THE COMPANY PRIOR TO INSTALLATION.
7. ON 277/480 VOLT INSTALLATIONS, A DISCONNECT SWITCH SHALL BE AHEAD OF EACH METER.

## TYPICAL MULTI-UNIT METER CENTER WITH GROUPED LOAD BREAKER PANEL

Figure 41

REFERENCE LETTERS TO PARTS ON DRAWING:

- A INDIVIDUAL SOCKET FACE, ONE FOR EACH METER OPENING.
- B COMMON TRIP LOAD BREAKER FOR EACH APARTMENT. BREAKERS SHALL BE ON THE LOAD SIDE OF METER ENCLOSURE.
- C FIFTH TERMINAL TO BE PROVIDED WHEN USED ON 120/208 VOLT SINGLE PHASE AND IS ACCEPTABLE IN EITHER THE 6 OR 9 O'CLOCK POSITION AS SHOWN. (9 O'CLOCK POSITION PREFERRED)
- D IDENTIFICATION TAG MUST BE PLACED ON BOTH METER COVERS AND BREAKER FACE PLATES. SEE SECTION IV-A (4c & 4d).



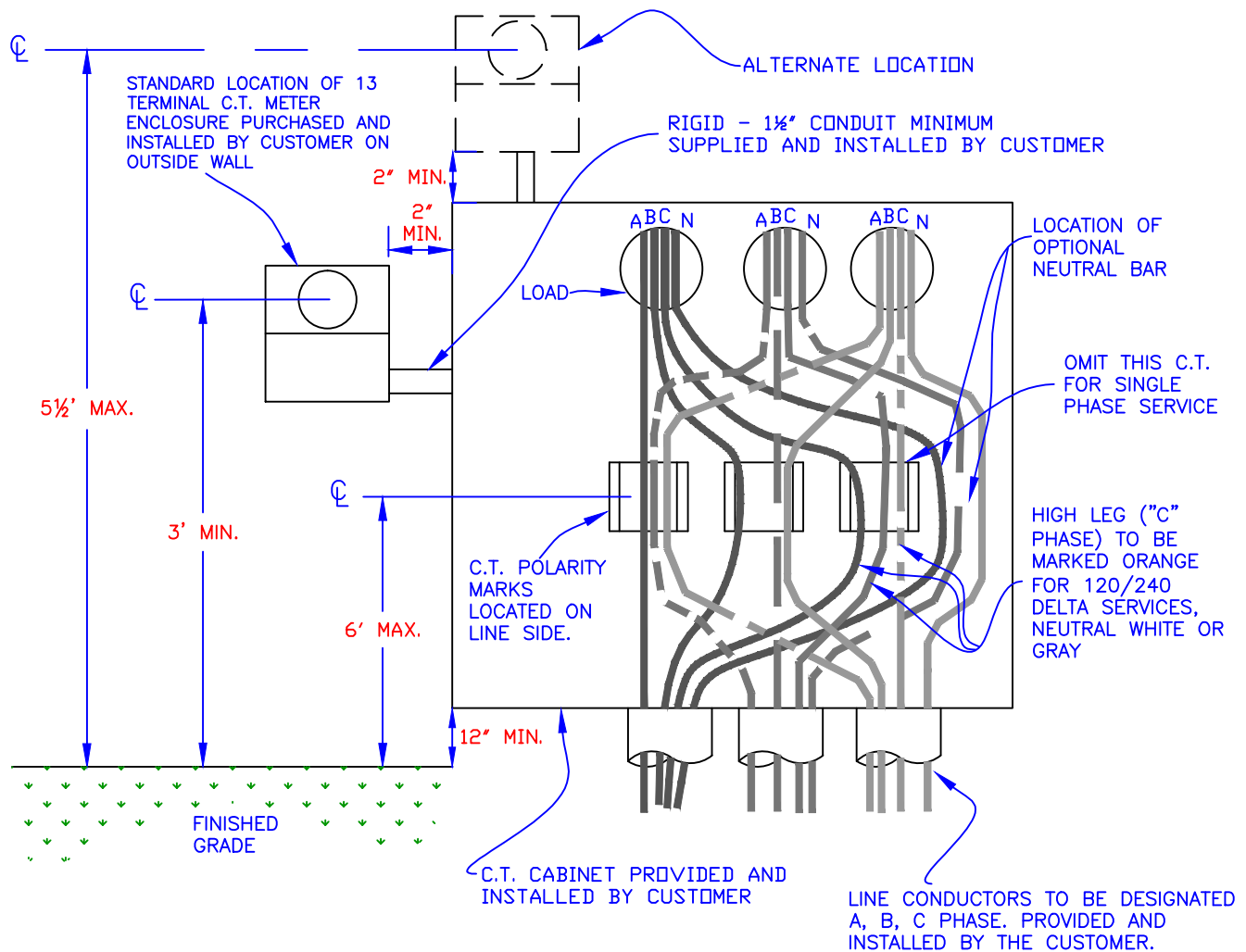
NOTES

1. METER ENCLOSURE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
2. ALL COMPONENTS AND RACEWAYS AHEAD OF METERS SHALL BE SEALABLE.
3. METER CENTER MUST COMPLY WITH REQUIREMENTS OF SECTION IV-B(2).
4. METER CENTER SHALL BE SUPPLIED AND MAINTAINED BY CUSTOMER.
5. COMMERCIAL GROUPED METER CENTERS MUST HAVE HEAVY DUTY JAW TENSION RELEASE LEVER TYPE BY-PASS SOCKETS.
6. METER CENTERS MUST BE APPROVED BY THE COMPANY PRIOR TO INSTALLATION.
7. ON 277/480 VOLT INSTALLATIONS, A DISCONNECT SWITCH SHALL BE AHEAD OF EACH METER.

**TYPICAL MULTI-UNIT METER CENTER WITH  
LOAD BREAKERS ON METER ENCLOSURE COVERS**

**Figure 42**



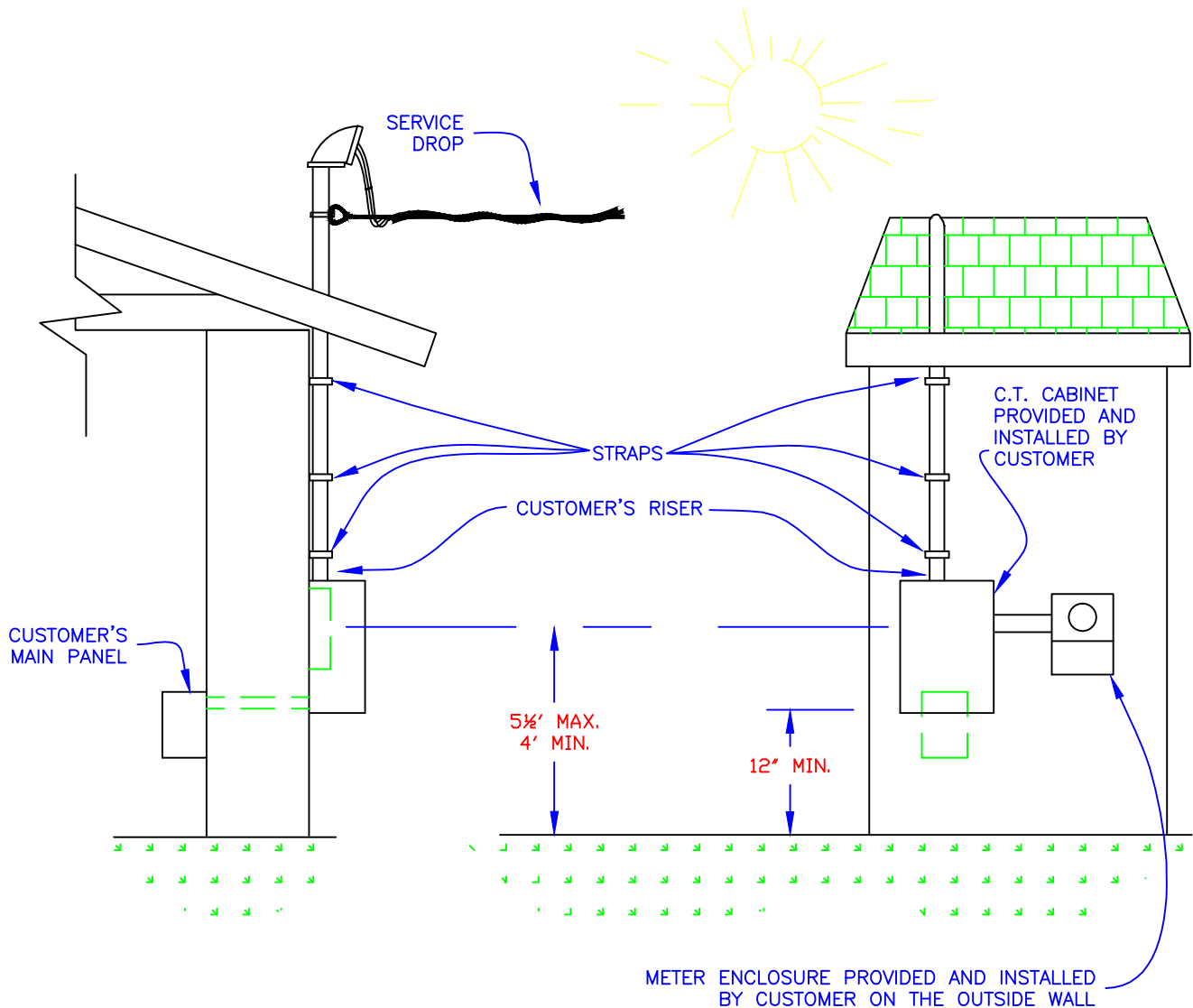


NOTES:

1. SEE APPROVED LIST FOR C.T. METER ENCLOSURES APPROVED BY THE COMPANY.
2. REFER TO TABLE I FOR THE MAXIMUM NUMBER OF CONDUIT, CONDUCTORS ALLOWABLE AND MINIMUM C.T. ENCLOSURE SIZE.
3. METER ENCLOSURE AND ASSOCIATED METER CABINETS SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C., AUTHORITY HAVING JURISDICTION AND THE COMPANY.

**TYPICAL OUTDOOR UNDERGROUND WALL MOUNTED  
CURRENT TRANSFORMER INSTALLATION  
FOR 120/208V, 120/240V, 277/480V**

**Figure 43**

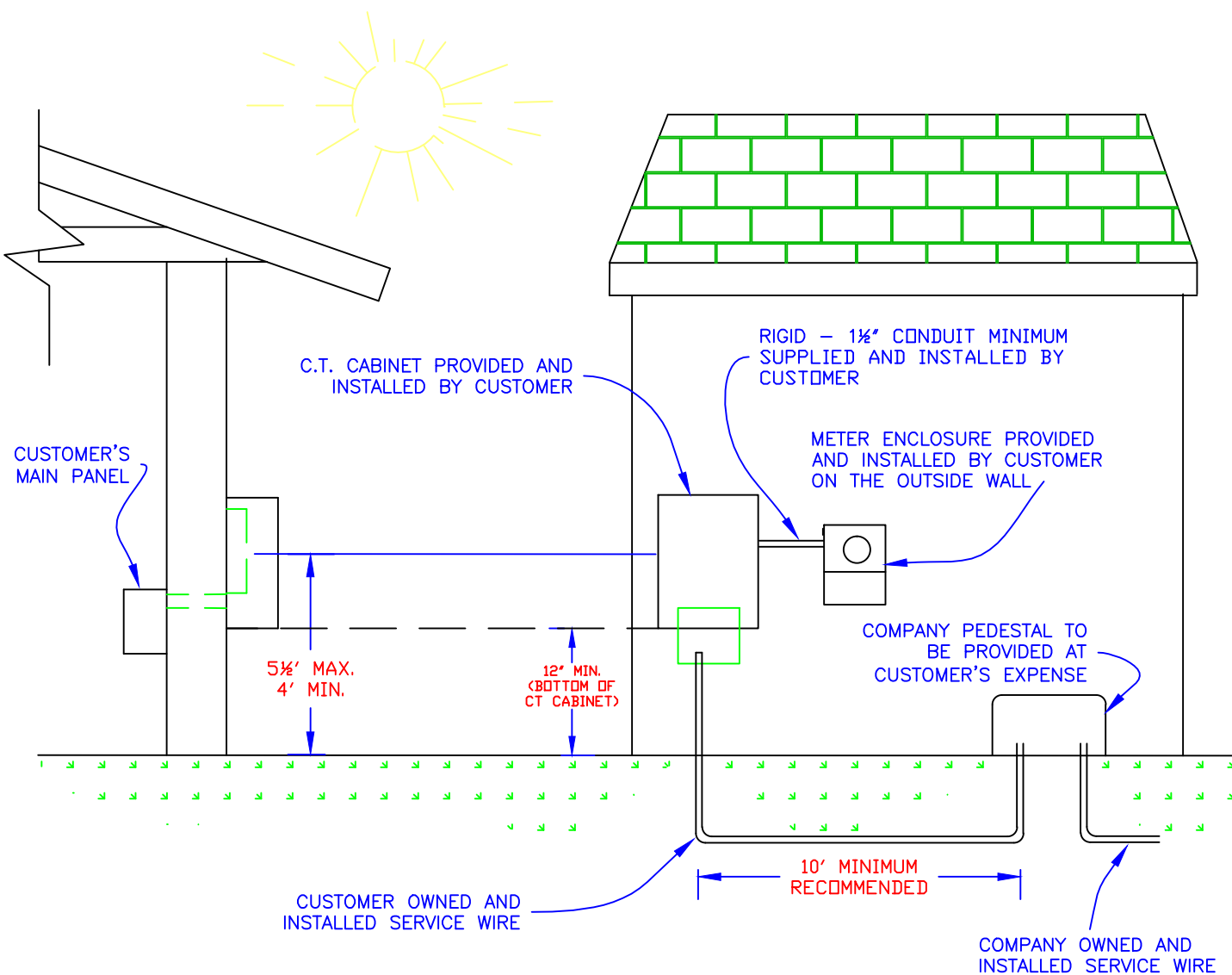


NOTES:

1. SEE APPROVED LIST FOR C.T. METER ENCLOSURES APPROVED BY THE COMPANY.
2. METER ENCLOSURE AND ASSOCIATED METER CABINETS SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C., AUTHORITY HAVING JURISDICTION AND THE COMPANY.

**TYPICAL CURRENT TRANSFORMER CABINET AND METER  
ENCLOSURE INSTALLATION FOR OVERHEAD SERVICES  
FOR 120/208V, 120/240V, 277/480V**

**Figure 44**



NOTES:

1. SEE APPROVED LIST FOR C.T. CABINET SIZES APPROVED BY THE COMPANY.
2. METER ENCLOSURE AND ASSOCIATED METER CABINETS SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C., AUTHORITY HAVING JURISDICTION AND THE COMPANY.

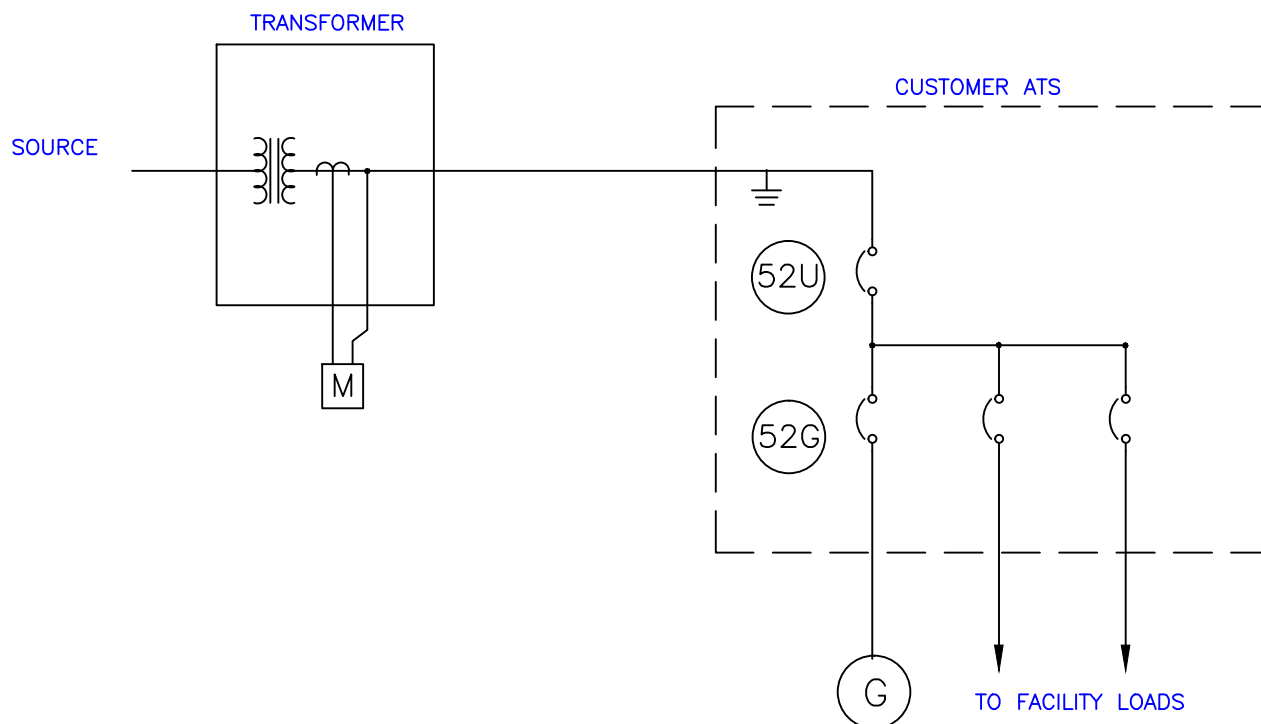
**TYPICAL RESIDENTIAL CURRENT TRANSFORMER CABINET AND  
METER ENCLOSURE INSTALLATION FOR UNDERGROUND SERVICES  
FOR 120/208V, 120/240V**

**Figure 45**



1. SEE APPROVED LIST FOR C.T. METER ENCLOSURES APPROVED BY THE COMPANY.
2. METER ENCLOSURE AND METER CABINETS SHALL BE BONDED AS REQUIRED BY THE N.E.C., AUTHORITY HAVING JURISDICTION AND THE COMPANY.
3. THIS INSTALLATION MAY NOT BE USED IF TRANSFORMER PROVIDES SERVICE TO MORE THAN ONE CUSTOMER.
4. CAUTION! "UTILITY LOCATE" REQUIRED PRIOR TO INSTALLATION OF POST. CALL 1-800-432-4770. MINIMUM OF 72 HOURS REQUIRED FOR "LOCATES".
5. METER PEDESTAL MUST BE RIGID ENOUGH TO WITHSTAND FORCES APPLIED WHEN METERS ARE INSTALLED OR REMOVED.
6. CONTACT AUTHORITY HAVING JURISDICTION FOR MINIMUM DEPTH UNDER RIGHT-OF-WAY.

### Figure 46



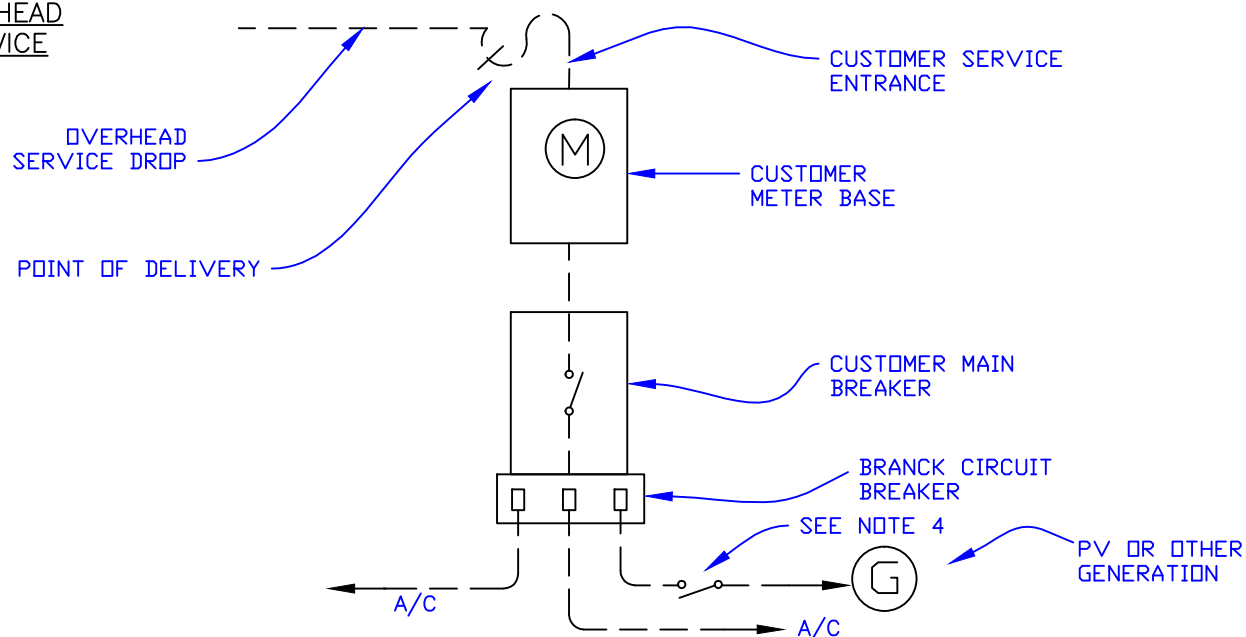
#### LEGEND

- |  |  |  |                        |  |   |
|--|--|--|------------------------|--|---|
|  | GENERATOR  |  | GENERATOR SIDE BREAKER |  | UTILITY SIDE BREAKER WITH LOCKABLE OPEN FEATURE |
|  | METER  |  | ATS                    |  | GENERATOR SIDE BREAKER                          |
|  | GROUNDING PROVISION PROVIDED BY CUSTOMER TO MEET THE FOLLOWING SPECIFICATIONS: |  |                        |  |   |
|  | 1. ACCESSIBLE TO COMPANY   |  |                        |  |   |
|  | 2. 10' CLEARANCE   |  |                        |  |   |
|  | 3. GROUND BALL STUD(S) ON EACH PHASE AND NEUTRAL                               |  |                        |  |   |
|  | A. MOUNTED IN HORIZONTAL POSITION  |  |                        |  |   |
|  | B. 25MM OR 30 MM DIAMETER  |  |                        |  |   |
|  | C. 4" MIN. LENGTH INCLUDING BALL   |  |                        |  |   |
|  | D. FAULT CURRENT RATED FOR GEAR BUSS.  |  |                        |  |   |
|  | E. MULTIPLE GROUND BALL STUDS MAY BE NEEDED TO MEET AVAILABLE FAULT CURRENT.   |  |                        |  |   |

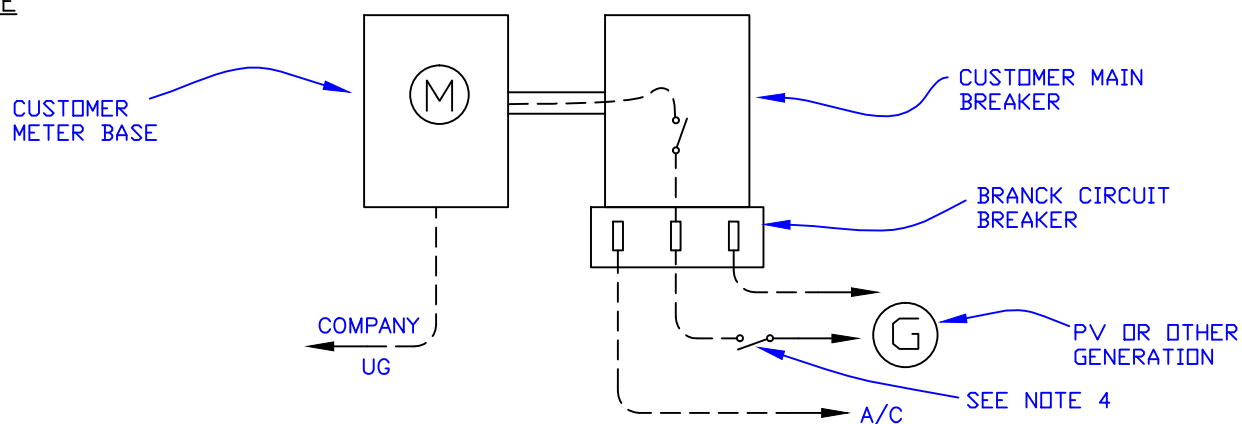
### SERVICE WITH STANDBY GENERATION AUTO TRANSFER SWITCH PARALLEL (>100 MILLISECONDS) TOTAL FACILITY LOAD

Figure 47

## OVERHEAD SERVICE



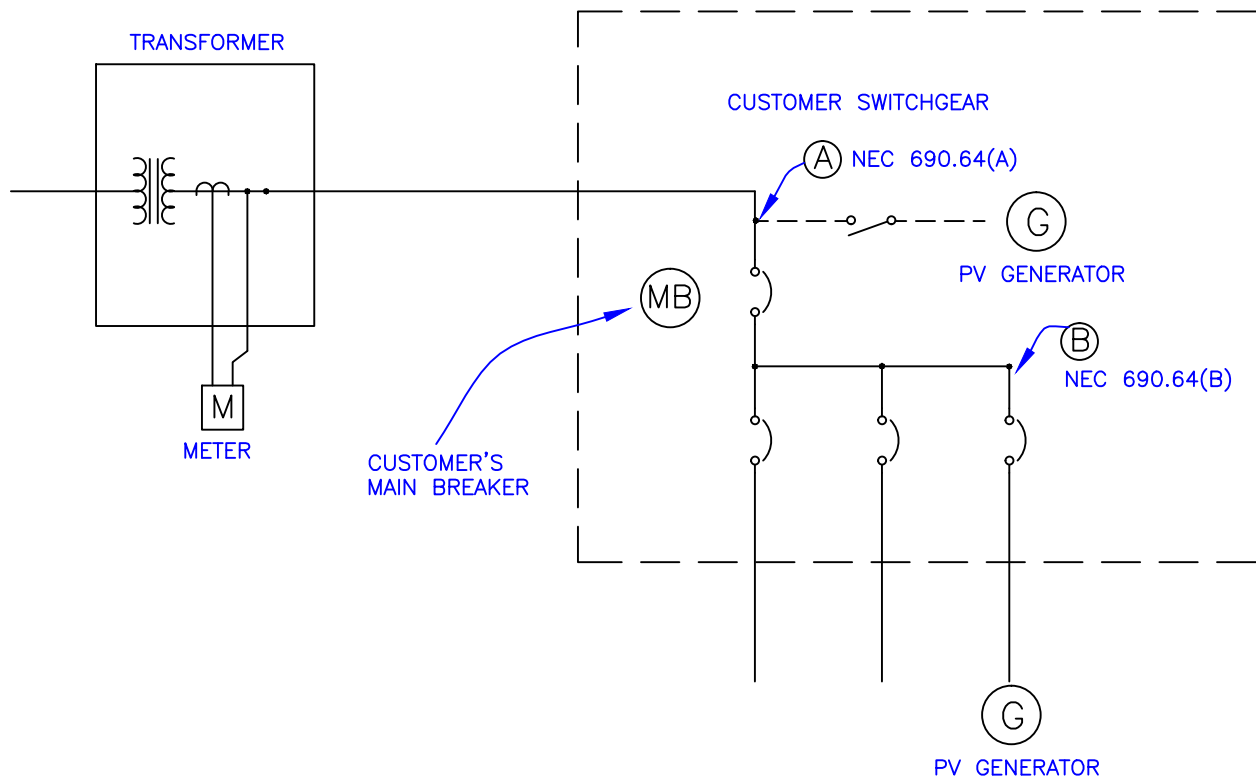
## UNDERGROUND SERVICE



1. FOR EXISTING SINGLE OR THREE-PHASE T.O.U. CUSTOMERS WHO ADD PV/OTHER GENERATION IN A "NET" METER ARRANGEMENT (LOAD SIDE OF CUSTOMER'S MAIN BREAKER).
2. EXISTING METER MUST BE REPLACED WITH BI-DIRECTION "NET" METER.
3. GENERATOR WIRING MUST MEET NEC ARTICLE 690 (PV SYSTEMS), 692 (FUEL CELL) OR 700 (EMERGENCY SYSTEMS).
4. A LOAD BREAK RATED EXTERNALLY ACCESSIBLE, LOCKABLE A/C DISCONNECT SWITCH IS REQUIRED FOR PV SYSTEMS >10 KW.

## **"NET" GENERATION METERING SINGLE OR THREE-PHASE SELF-CONTAINED METERED SERVICE RESIDENTIAL/SMALL COMMERCIAL**

**Figure 48**



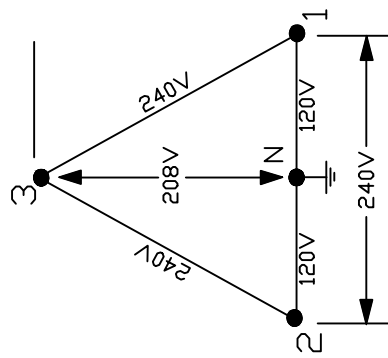
NOTES:

1. GENERATION DISCONNECT CAN BE CONNECTED AT EITHER (A) OR (B) PER NEC 690.64(A) OR (B).
2. PV GENERATION DISCONNECT POSITION (A) REQUIREMENTS: MUST BE LOAD-BREAK RATED, LOCKABLE OPEN POSITION AND PROVIDE VISIBLE OPEN.  
EXCEPTION: FOR DISCONNECTS RATED  $\leq$  1000 AMPS AT 480y/277 VOLTS NO VISIBLE OPEN IS REQUIRED, BUT ALL OTHER PROVISIONS MUST BE MET.
3. PV GENERATION DISCONNECT POSITION (B) REQUIREMENTS: MUST BE LOAD-BREAK RATED AND LOCKABLE OPEN PROVISION.
4. EXISTING METER MUST BE REPLACED WITH BI-DIRECTIONAL METER.
5. WARNING LABEL (CN 922128098) MUST BE PLACED AT METER AND GENERATOR DISCONNECT.

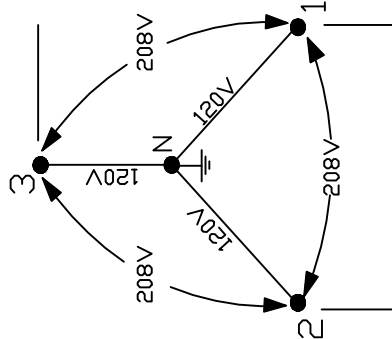
**"NET GENERATION METERING THREE-PHASE (T-RATED SERVICES) LARGE COMMERCIAL/INDUSTRIAL**

**Figure 49**

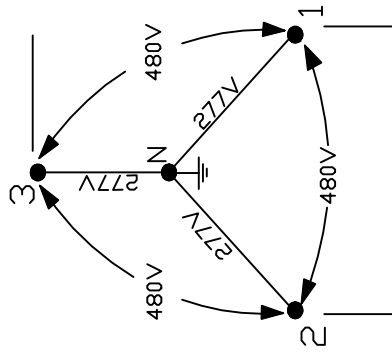
120/240V DELTA



120/208V WYE



277/480 WYE



POINTS MEASURED	120/240V DELTA	120/208V WYE	277/480V WYE
N-1	120	120	277
N-2	120	120	277
N-3	208	120	277
1-2	240	208	480
1-3	240	208	480
2-3	240	208	480

STANDARD THREE PHASE SERVICE VOLTAGES

Figure 50



		NUMBER OF COMPANY CONDUCTORS PER PHASE		
NUMBER OF CUSTOMER CONDUCTORS PER PHASE		1	2	3
	1		N/A	N/A
	2			N/A
	3			
	4			
	5			
	6			

#### LEGEND

	CUSTOMER OWNED CONDUCTORS		COMPANY OWNED CONDUCTORS
--	---------------------------	--	--------------------------

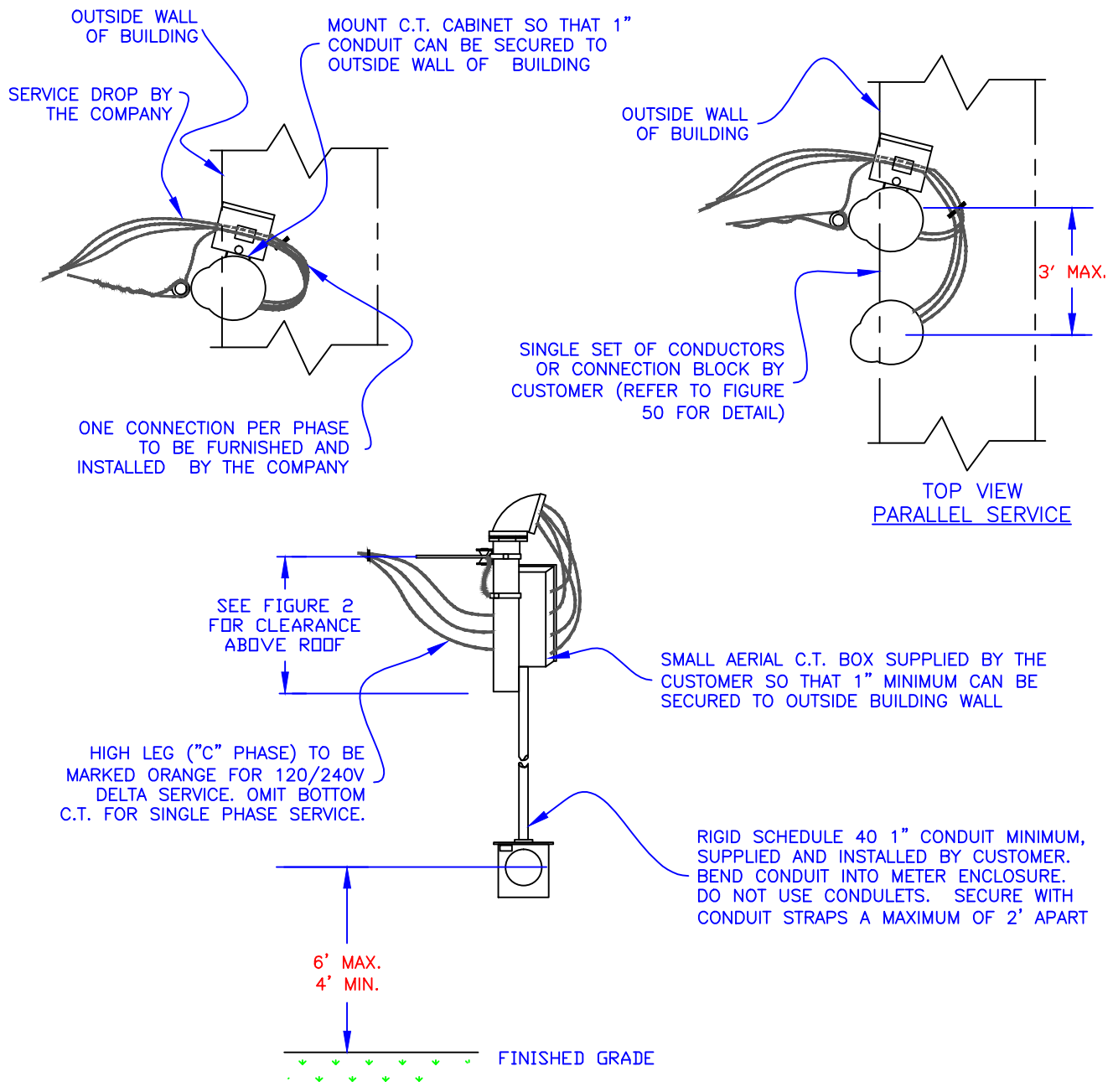
#### NOTES:

1. CONNECTORS SUPPLIED BY CUSTOMER.
2. CUSTOMER MUST CONTACT THE COMPANY TO DETERMINE APPLICABILITY OF CHART OR CONDITIONS NOT COVERED BY CHART.
3. DOUBLE LUGGING CONDUCTORS NOT PERMITTED.

### TYPICAL MULTIPLE BLOCK TYPE CONDUCTOR CONNECTIONS

Figure 51

## EXISTING INSTALLATIONS ONLY



### NOTES:

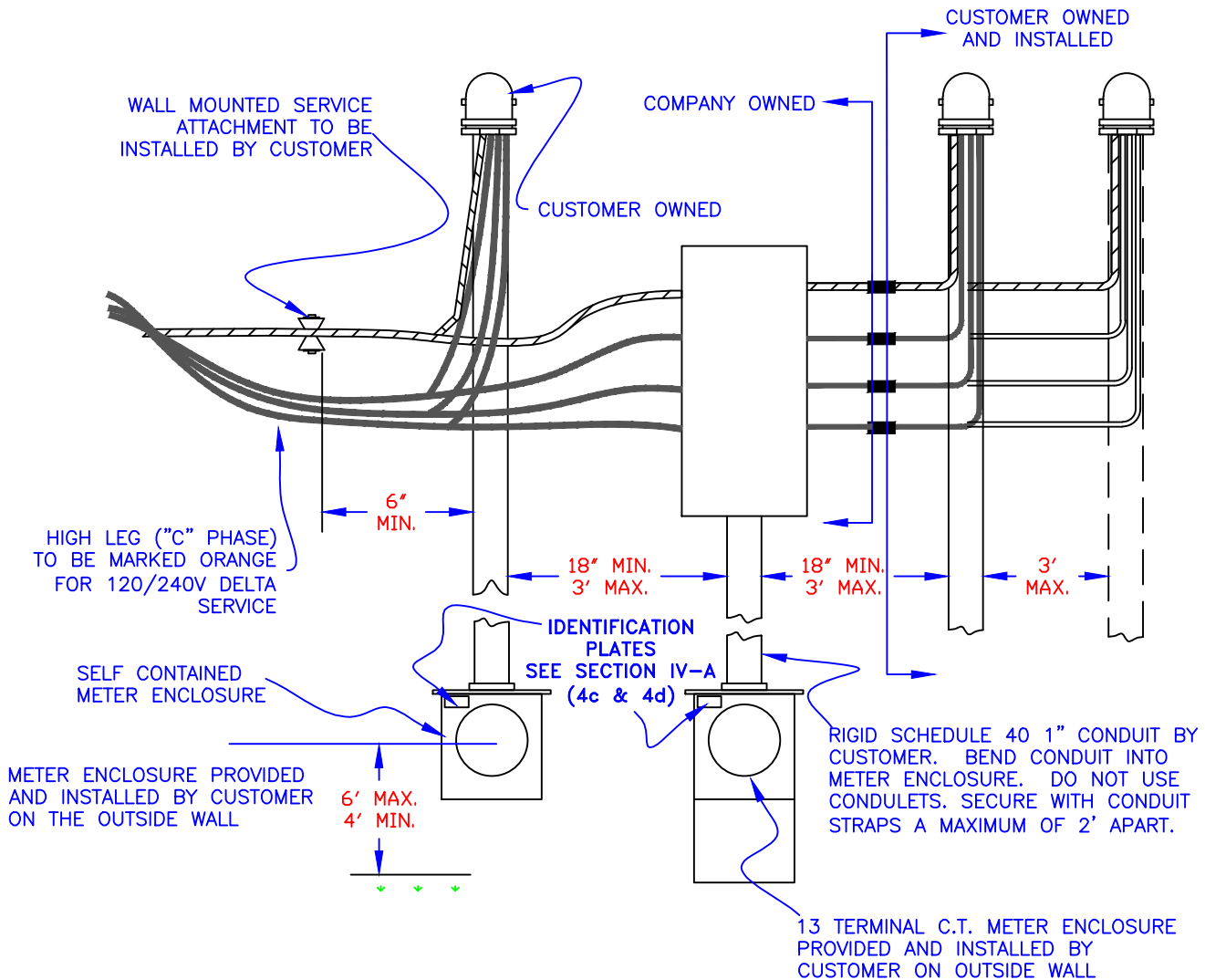
1. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C., AUTHORITY HAVING JURISDICTION AND THE COMPANY.

### **C.T. CABINET INSTALLATION ON SERVICE RISER THREE PHASE, 4 WIRE OR SINGLE PHASE, 3 WIRE SERVICE**

**Figure 52**

## EXISTING INSTALLATIONS ONLY

CUSTOMER SHALL CONNECT MULTIPLE RISERS BEHIND THE C.T.'S TO A SINGLE SET OF CONDUCTORS OR CONNECTION BLOCK FOR CONNECTION TO THE SERVICE DROP BY THE COMPANY. (REFER TO FIGURE 50 FOR CONNECTION BLOCK DETAILS).



### NOTE:

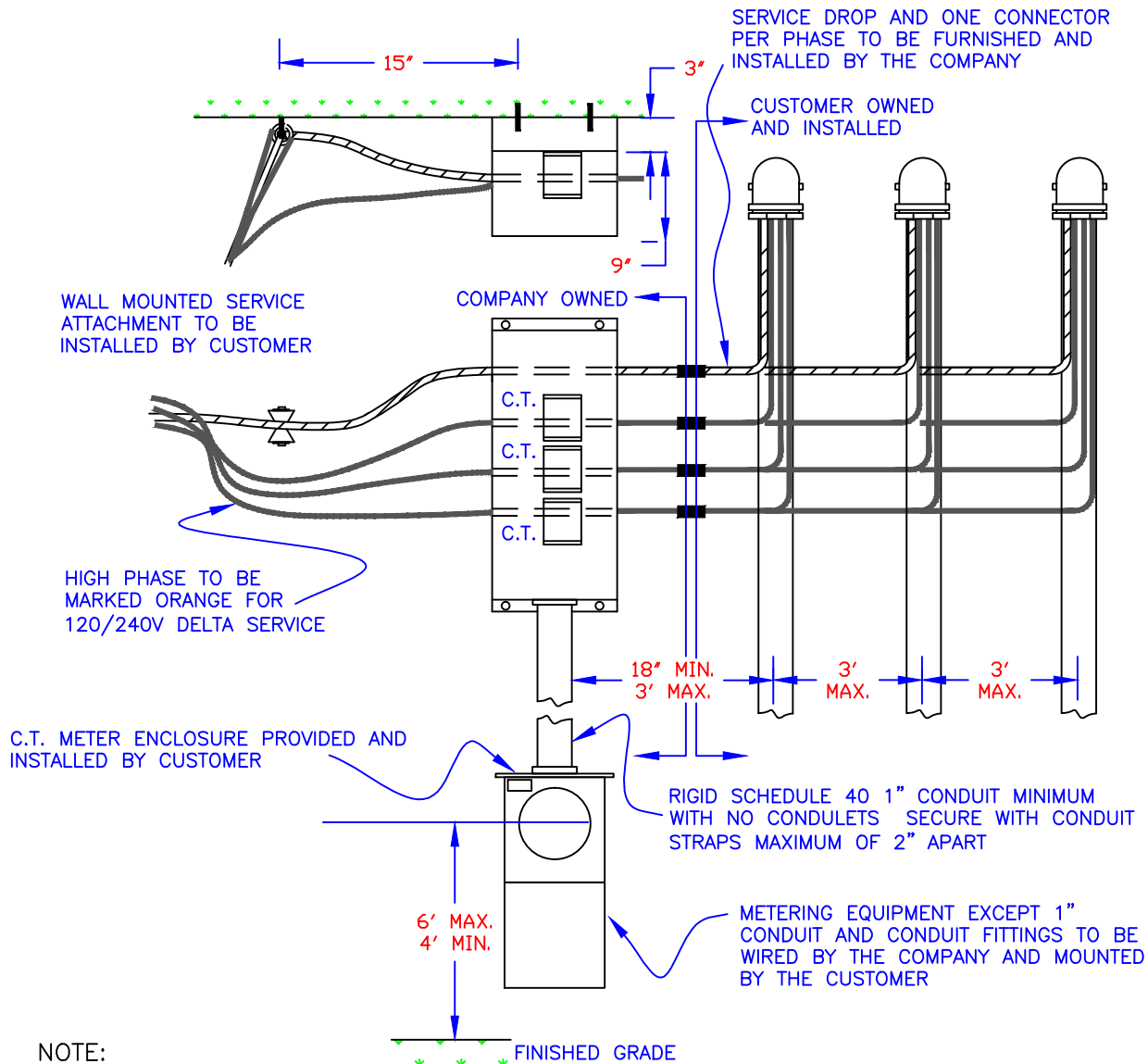
1. SEE APPROVED LIST FOR C.T. METER ENCLOSURE APPROVED BY THE COMPANY.
2. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C., AUTHORITY HAVING JURISDICTION AND THE COMPANY.

## COMBINATION SELF-CONTAINED AND C.T. METER INSTALLATION FOR OVERHEAD SERVICE (WALL MOUNTED)

Figure 53

## EXISTING INSTALLATIONS ONLY

CUSTOMER SHALL CONNECT MULTIPLE RISERS BEHIND THE C.T.'S TO A SINGLE SET OF CONDUCTORS OR CONNECTION BLOCK FOR CONNECTION TO THE SERVICE DROP BY THE COMPANY. (REFER TO FIGURE 50 FOR CONNECTION BLOCK DETAILS.)



NOTE:

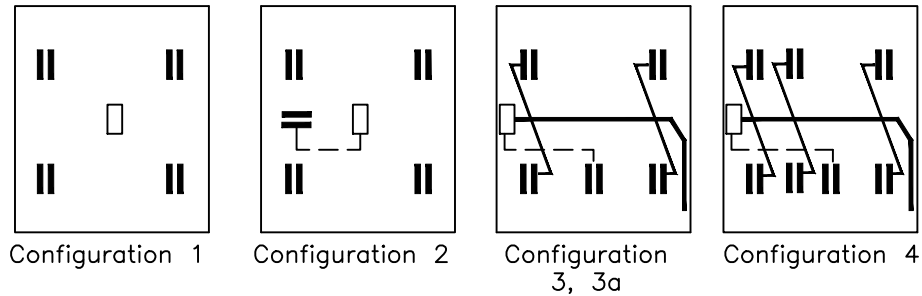
1. SEE APPROVED LIST FOR C.T. METER ENCLOSURE APPROVED BY THE COMPANY.
2. CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C., AUTHORITY HAVING JURISDICTION AND THE COMPANY.

## THREE PHASE, 4 WIRE, WALL MOUNTED C.T. CABINET INSTALLATION

Figure 54

## METERING CONFIGURATIONS - DESCRIPTIONS AND NOTES

### SELF CONTAINED METER ENCLOSURES



### GENERAL NOTES ON SELF CONTAINED METER SOCKET BLOCK CONFIGURATION

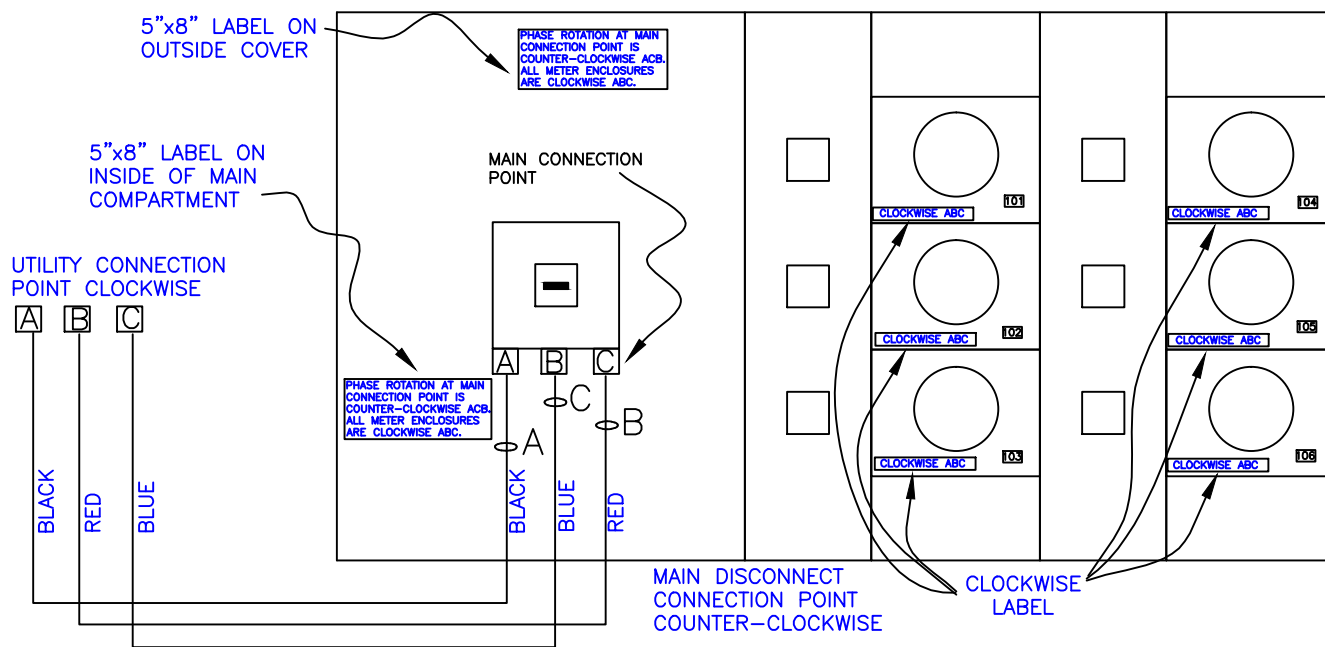
- Configuration 1 – Primarily residential applications. Limited to 320 amp connected. (See Note 1)
- Configuration 2 – Modification of Configuration 1 by adding a 5th terminal in the 9 o'clock position. To be used with network meters. Limited to 320 amp connected.
- Configuration 3 – For one phase service requiring bypass device. Limited to 320 amp connected.
- Configuration 3a – Modification of Configuration 3 (5th terminal for network meters). Limited to 320 amp connected. (See Note 2)
- Configuration 4 – For three phase service. Limited to 320 amp connected. (See Note 2)

Note 1 – May be used for very small commercial applications, such as billboards and parking lot lights.

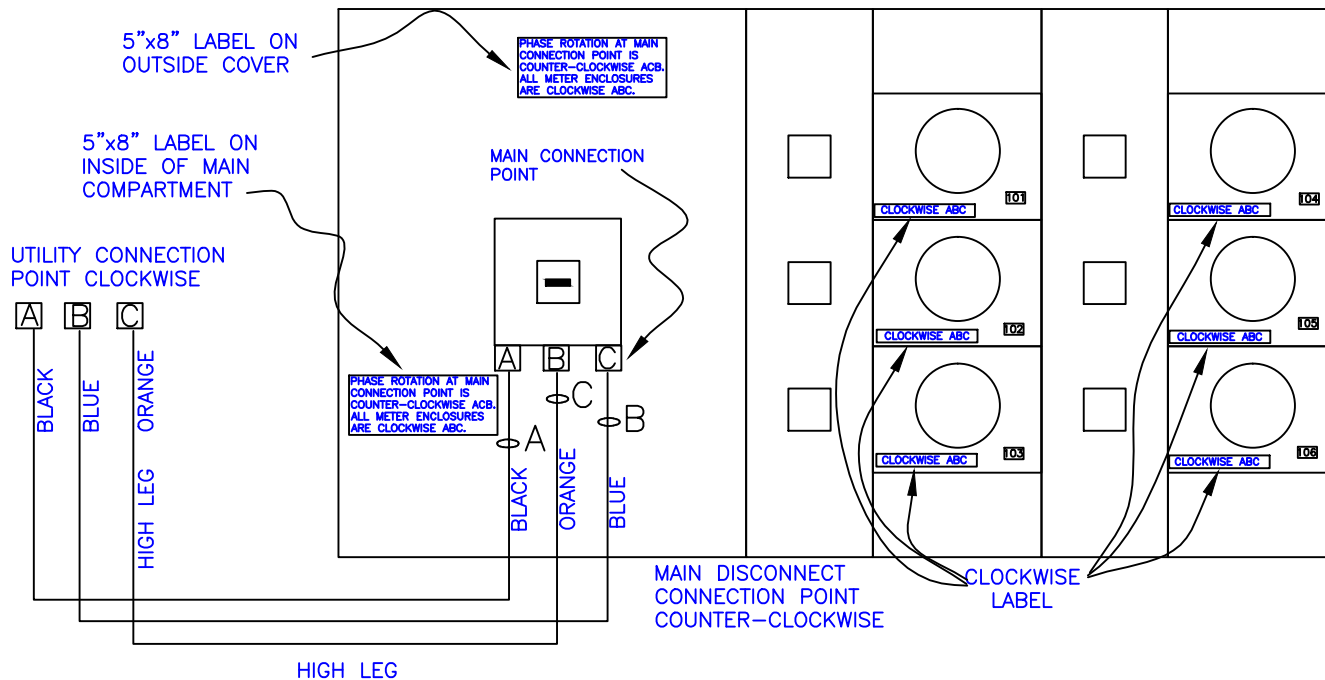
Note 2 – All three phase and/or all commercial installations shall have a meter socket with the approved bypass jaw tension/release device.

**Figure 55**

120/208 VOLT 3-PHASE, 4-WIRE, WYE CONFIGURATION



120/240 VOLT 3-PHASE, 4-WIRE, DELTA CONFIGURATION



## THREE PHASE TO THREE PHASE MODULAR METER CENTERS

### Figure 56

CABINET SIZE H x W x D	CONDUIT SIZE	MAXIMUM NO. OF CONDUITS	CONDUCTOR SIZE	MAXIMUM NUMBER OF CONDUCTORS
46" x 30" x 14½"	4" or Smaller	6 IN 6 OUT	500 KCM or Smaller	24 OUT 24 IN
	4" or Smaller	5 IN 5 OUT	750 KCM or Smaller	20 OUT 20 IN
34" x 32" x 12"	4" or Smaller	5 IN 5 OUT	500 KCM or Smaller	20 OUT 20 IN
	4" or Smaller	4 IN 4 OUT	750 KCM or Smaller	16 OUT 16 IN
	4" or Smaller	2 IN 2 OUT	500 KCM or Smaller	8 OUT 8 IN
	4" or Smaller	1 IN 1 OUT	750 KCM or Smaller	4 OUT 4 IN

WHEN USING ONE OR MORE SETS OF 750 KCM CONDUCTOR, THE 750 KCM SPECIFICATIONS WILL BE FOLLOWED! NO EXCEPTIONS!

## SELECTION GUIDE FOR C.T. CABINET AND CONDUCTOR SIZE

**Table 1**