

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

North Carolina  
and  
South Carolina



**AUGUST 2016**

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The following policies and rules were the Company requirements at the date of publication and are subject to change. This publication is revised periodically, and bulk printed for distribution and made available at no cost to electrical contractors, electrical inspectors, and other interested parties every year.

Download the latest version of the “[Service Requirements Manual](http://www.duke-energy.com/pdfs/Service-Requirements-Manual.pdf)” from the Duke Energy Progress website or <http://www.duke-energy.com/pdfs/Service-Requirements-Manual.pdf> from the Duke Energy Carolinas website.

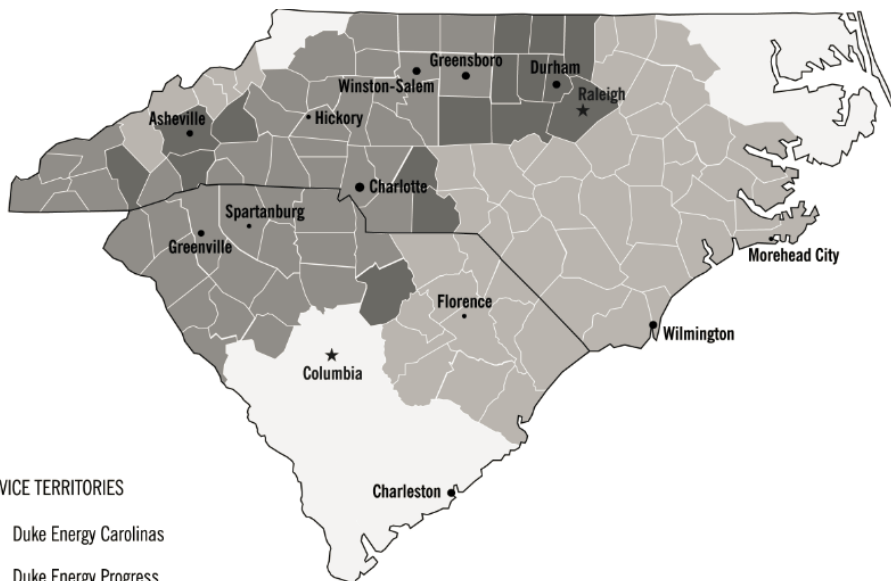
Copies of this publication can also be obtained by contacting Larry Medlin (DEP) [Larry.Medlin@duke-energy.com](mailto:Larry.Medlin@duke-energy.com) or Ashley Eanes (DEC) [Ashley.Eanes@duke-energy.com](mailto:Ashley.Eanes@duke-energy.com) or your local Company Representative.

## Requirements for Electric Service and Meter Installation Book 2016 Review Committee Members




Greater Wake County Building Officials Association  
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 Gary Stafford – Cary, NC  
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Florence County, SC	Shawn Brashear and Brice Isgett
Greensboro, NC	Pat Rose
Charlotte/Mecklenburg, NC	Gary Mullis
Greenville, SC	John Bryson

# Service Area Map



## SERVICE TERRITORIES

-  Duke Energy Carolinas
-  Duke Energy Progress
-  Duke Energy Carolinas/Progress Overlap

*\*Portions may be served by other utilities.*

## **Duke Energy Progress (DEP) CUSTOMER CARE CENTER**

**TO APPLY FOR SERVICE**

**(919)508-5400**

**1-800-452-2777**

**OR VISIT WEB SITE AT**

**[www.duke-energy.com/progress](http://www.duke-energy.com/progress)**

**TO REPORT POWER OUTAGES**

**1-800-419-6356**

## **Duke Energy Carolinas (DEC) CUSTOMER CARE CENTER**

**TO APPLY FOR SERVICE**

**1-800-777-9898**

**OR VISIT WEB SITE AT**

**[www.duke-energy.com](http://www.duke-energy.com)**

**TO REPORT POWER OUTAGES**

**1-800-769-3766**

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# SECTION I

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## INTRODUCTION

The Company 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 and local inspecting authorities so they may receive full benefit from Company's service. The purpose of this book is to be of assistance when planning new electrical installations, revamping old ones or adding additional equipment.

All users 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. Include details, sketches, drawings and all pertinent supporting information.
3. Questions or comments can be sent to:

[Larry.Medlin@duke-energy.com](mailto:Larry.Medlin@duke-energy.com)      DEP Metering

[Carrie.Davin@duke-energy.com](mailto:Carrie.Davin@duke-energy.com)      DEC Metering

[Ashley.Eanes@duke-energy.com](mailto:Ashley.Eanes@duke-energy.com)      Standards

Except for the installation and maintenance of its own property, the Company does not install or repair wiring on the Customer's premises and, therefore, is not responsible for the electricity beyond the P. O. D. 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.

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

**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

**Contribution-in-Aid of Construction (CIAC)** – 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 the user's 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.

**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 normally connected in such a way that no Interconnection can exist.

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

**Instrument Transformer** – Current Transformer (CT) or Voltage Transformer (VT) 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.

**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 watt-hour meter

**NRTL** – Nationally Recognized Testing Laboratories such as UL, MET Labs, ETL, TUV, etc.

**National Electrical Code (N.E.C.)** – A code sponsored by the National Fire Protection Association 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.

**Point Of Delivery (P.O.D.) or Delivery Point**– 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.

**Power Leg (High-Leg)** – The conductor in a three-phase, 4-wire delta secondary connection that has a higher voltage-to-ground potential than the other conductors.

**Premise** – the street address (physical location) to which the Company provides electric service: a house, apartment, business, area light, or street light. Every electric service account is associated with a premise, although a premise may have more than one account associated with it. For example, if a Customer has a separately metered shop behind his house, the shop and house must be on separate accounts, but they are associated with the same premise.

**Service** – The supply of electricity from the Company 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.

**Service Drop** – The overhead service conductors between the Company's facilities (last service pole) and the Point of Delivery to the Customer's property.

**Service Entrance** – Normally, Customer-owned wire and/or 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.

**Solar Photovoltaic (PV) System** – The total components and subsystems that, in combination convert solar energy into electric energy suitable for connection to a utilization load.

**Tariffs** – The applicable rates and electric service rules and regulations under which all energy is delivered and all service is rendered by the Company.

**Temporary Construction Service** – Electrical service provided temporarily for the purposes of providing electricity to aid in the construction of a permanent facility.

**Temporary Service** – Service to non-permanent locations such as fairs, displays, exhibits, and similar temporary purposes.



## 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 normal P.O.D.** The Company shall make extensions to its existing facilities when required, and a Customer CIAC may be required. These extensions shall be to the point that 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.
2. To ensure 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. The Customer shall submit appropriate load data to the Company. Contact your local Duke Energy engineer to determine the required load data and necessary forms. **Before construction is started, the Customer shall request the Company to designate a normal P.O.D.** The request for P.O.D. location is not an application for Service to the permanent building.
3. It is imperative that the Company and the Customer be in agreement with the planned location of all Service-related equipment before construction is started. However, the Company shall have the final authority to determine the location. This equipment includes meters, risers, pedestals, pull boxes, CT/VT cabinets, transformers, etc. The selected Service equipment location must also meet the N.E.C. and all local ordinances, including any flood elevation requirements.

## C. APPLICATION FOR SERVICE

### Duke Energy Progress (DEP)

To obtain Service at the desired time, an application for 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 and/or deposits may be required prior to Service connection.

#### To apply for service:

By E-mail: [Builder.Express@duke-energy.com](mailto:Builder.Express@duke-energy.com) or use our Web site [www.duke-energy.com/progress](http://www.duke-energy.com/progress) to:

- Apply for service
- Check your work request status: Builder/Customer number required

**By Fax:** Builder FAX Line

**1-800-706-7488**

24 hours a day – 7 days a week

Company will fax a confirmation to you within 2 to 3 business days. Use the Builder Request Form.

**By Phone:** Builder Express Line

**1-800-636-0581**

7 A.M. – 6 P.M. Monday – Friday

Company's busiest days are Mondays and days after holidays.

Have your builder/Customer number ready.

## ESTABLISHING TEMPORARY CONSTRUCTION SERVICE

1. Builder arranges for electrician to set the temporary meter base. See **Figures 1A (DEP UG) and Figure 2 (OH)**.
2. Builder contacts the Company by Web site, fax, or phone with builder/Customer number and specifies whether Service to be installed needs to be underground or overhead. A Company representative enters application for Service and holds for inspection and/or construction if needed. Representative issues premise number for use during all transactions at this location.
3. If it is necessary, the Company begins line construction process (requires a minimum of 10 business days).

4. Builder arranges for inspection of temporary meter base by the Authority Having Jurisdiction and supplies Inspector with premise number.
5. City/county performs inspection and notifies the Company of results prior to meter being installed. (Process may vary from county to county.)
6. Company sets meter within one to four business days once inspection is received and construction is complete, if needed.

## **ESTABLISHING PERMANENT SERVICE FOR A NEWLY CONSTRUCTED RESIDENCE**

1. Builder completes final grade of property, clears right-of-way, and has meter base set on house. If permanent Service is to be in owner's name, builder should give premise number to owner.
2. Builder contacts the Company by web site, fax, or phone to request permanent Service, provides premise number and the following information: length of underground service to be installed, if needed; demographics of construction (heat type, square footage, etc); and whether Temporary Service needs to be removed when permanent meter is set. A Customer Care Specialist enters application for service and holds for inspection and/or construction if needed. If it is necessary, the Company begins line construction process .
3. Builder arranges for inspection of meter base and supplies Inspector with premise number.
4. AHJ performs inspection and notifies the Company of results prior to meter being installed. (Process may vary from county to county.)
5. Company sets meter on permanent meter base once inspection is received and construction is complete, if needed. See **Figures 4A, 4B, 5, 8, 9A, 9B, 10, and 11.**

## **ESTABLISHING SERVICE FOR A NEW MANUFACTURED HOME**

1. Upon final grade of property, homeowner confirms that meter base is set and right of way is cleared. See **Figures 4A, 4B, 9A, and 9B.**

2. Homeowner contacts the Company by phone or fax to request permanent Service and provides the following information: demographics of construction (heat type, square footage, etc.).
3. A Customer Care Specialist enters application for service and holds for inspection and/or construction if needed. Specialist issues premise number for use during all transactions at this location. If line construction is necessary, the Company begins line construction process.
4. Homeowner arranges for inspection of permanent electrical installation and meter base and advises Authority Having Jurisdiction of premise number.
5. Authority Having Jurisdiction performs inspection and notifies Company of results prior to meter being installed. (Process may vary from county to county.)
6. Company sets meter on permanent meter base once inspection is received and construction is complete, if needed.

#### **ESTABLISHING PERMANENT SERVICE FOR A NEWLY-CONSTRUCTED COMMERCIAL BUSINESS**

1. Builder contacts the Company by web site, fax, or phone to request permanent service. See Figures 20, 21, 28, 40, 47A, 47B, and 52.
2. The Company Representative provides the premise number. The builder provides the following information: length of underground service to be installed, if needed; demographics of construction (heat type, square footage, etc.); and whether temporary service needs to be removed when permanent meter is set. Company Representative enters application for service and holds for inspection and/or construction if needed. If it is necessary, the Company begins line construction process
3. Builder completes final grade of property and clears right-of-way. If permanent service is to be in owner's name, builder should give premise number to owner.
4. Company Representative creates order and informs engineering of new commercial job and creates new account number.
5. If the Customer requires Transformer-rated metering, the Company Representative communicates meter information to meter technician

and creates a meter order. Otherwise, a self-contained meter is required. (See **SECTION IV**)

6. Company installs Transformer-rated metering equipment.
7. Builder arranges for inspection of their electrical service and supplies inspector with premise number.
8. City/county performs inspection and notifies the Company of results prior to meter being installed. (Process may vary from county to county.)
9. Company energizes new account once inspection is received, construction is complete, installs a self-contained meter (if required), and completes connect set order.

## **D. APPLICATION FOR SERVICE**

### **Duke Energy Carolinas (DEC)**

To obtain Service at the desired time, an application for 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 and/or deposits may be required prior to Service connection. Contact Company as early in the planning stage as possible. This allows adequate time to secure any rights of way, plan and build any lines needed, spot meter location and complete any other work required to install electric service.

Applications are available for both temporary and permanent service online or by fax. To request an application call **800-454-3853** or visit [duke-energy.com](http://duke-energy.com).

## **TEMPORARY CONSTRUCTION SERVICE**

Prior to beginning construction, Customer will complete an application for electric service. This application for Temporary Construction Service alerts Company of the need for construction site power and also enables Company to set up the account using the appropriate rate. Standard for temporary services are found in **Figure 1B (DEC UG)** and **Figure 2 (OH)**.

## **NONSTANDARD TEMPORARY CONSTRUCTION SERVICE**

Charges will be applied to any nonstandard temporary construction service.

## **RESIDENTIAL SERVICE: PERMANENT OVERHEAD** (Site-built, manufactured and modular homes service)

Service to a manufactured home generally follows the same guidelines as permanent residential service to a site-built house. Single-wide manufactured homes normally have the meter enclosure mounted on a service pole or structure. See **Figures 4A, 4B, 5, 8, 9A, 9B, 10, and 11**. Customer's service pole should be placed so that Company primary, secondary and service conductors do not cross over the manufactured home.

Note for single-family homes: The electric meter on a single-family residence should be located on the exterior of the structure on the side closest to Company's equipment (pole, padmount transformer or service radial).

Important note for manufactured homes: Since a manufactured home can be set up on site within 24 hours, Customer should notify Company as soon as a site is chosen. This will allow adequate time to coordinate a method of service including primary line work, if necessary, and enable Company to plan accordingly.

## **RESIDENTIAL SERVICES: PERMANENT UNDERGROUND** (Site-built, manufactured and modular homes)

After reviewing Customer application for service, Company may contact Customer to obtain additional information. Company will need to determine at this meeting whether Company's conductors will lie under any concrete or structure (driveway, deck, patio, etc.). If so, arrangements will need to be made to avoid any future damage to Customer's property should the cable require repair or replacement.

Note: The electric meter on a single-family residence should be located on the side closest to Duke Energy's equipment (pole, pad-mount transformer or service radial). A clear route between the power source and the meter enclosure must be maintained to avoid charges. If a driveway is to be placed in this route and needs to be installed before the underground service is installed, Customer will need to install a 3-inch Schedule 40 electrical gray conduit (with a pull string) with a minimum 30-inch cover from the top of the conduit, making sure both ends of the conduit are clearly marked above ground.

## **METER BASE READY POLICY**

DEC's standard practice is to install service cables to permanently installed approved meter bases to streamline installation and to avoid damage to service cables. A permanently installed meter base includes load wires,

ground rod and the grounding conductor. If there are situations that prevent Customer from doing this, Company may mutually establish a “guaranteed” meter base location. However, once the “guaranteed” meter base location is specified and the underground service is installed, Customer will be responsible for all costs associated with relocating Duke Energy facilities to a new meter base location.

## **COMMERCIAL SERVICES**

To obtain commercial service, Customer will call Duke Energy at 800-653-5307. A Company specialist will receive the necessary business and electrical load information from Customer. If electrical load information is unknown, Company can mail or fax an electrical load information form and Customer electrical contractor or other electrical consultant can determine electrical needs (load, conductor size, delivery voltage, etc.).

Duke Energy will need time to secure any rights of way, plan and build any lines needed and complete other line work required to install the electrical service.

Refer to Figure 15 for standard metered service voltages.

### **COMMERCIAL SERVICES: PERMANENT OVERHEAD**

For commercial self-contained services, the following requirements must be met: (See **SECTION IV, A, 4**)

Customer furnishes and installs:

- Riser, weatherhead, ground rod and grounding conductor, and meter enclosure.
- Refer to Customer-Purchased Equipment in **Section IV(b)**. Refer to **Figures 47A, 47B, and 47C** for meter trough installations. The Duke Energy- approved meter enclosure is available from your local equipment supplier.
- Final inspection before the meter is installed.
- Attachment point – Should be located below the weatherhead except where it is impractical to do so because of clearance requirements. The height of the attachment point is dictated by the N.E.C. In those cases where it is impractical, the weatherhead must be within 24 inches of the point of attachment. See **Figures 9A, 9B, 10, 11, 12, and 13**.

Company furnishes and installs:

- Service cable
- Connectors and connections

Note: For commercial transformer-rated service, call **800-653-5307**.

## **COMMERCIAL SERVICE: PERMANENT UNDERGROUND**

Customer will need to identify all existing and proposed underground facilities so to prevent damage during installation of underground electrical facilities.

For commercial self-contained service, the following requirements must be met: (See chart in **SECTION IV, A**)

Customer furnishes and installs:

- Service pole, if required
- Ground rod and ground wire
- Meter enclosure – Position the meter enclosure so the meter is a minimum of 3 feet or a maximum of 6 feet from final grade. Refer to **Figures 4A and 4B**. Meter trough installation requirements are contained on **Figures 47A, 47B, and 47C**. The Duke Energy-approved meter enclosure is available from your local equipment supplier. A 200-amp meter enclosure minimum is required.
- Final inspection before the meter is installed

Duke Energy furnishes and installs:

- Conduit into meter enclosure
- Underground service conductor from an overhead energy source to the Customer's meter box

**Note:** For commercial transformer-rated service, call **800-653-5307**. (See **Figure 43A**.)



## E. TYPE OF SERVICE

1. **IT IS ESSENTIAL THAT THE CUSTOMER CONTACT THE CUSTOMER CONTACT CENTER REGARDING TYPE OF SERVICE THAT 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. Single-phase Service or three-phase Service shall be provided according to the following:
  - (a) Residential Customers and commercial Customers located in predominantly residential areas shall normally be provided with only 120/240 volt, 3-wire, single-phase Service. Three-phase Service to such Customers may be supplied if loads warrant such Service and the required Company facilities are readily accessible. The Customer may be charged a CIAC.
  - (b) In multi-occupancy buildings or complexes served by 208Y/120 volt three-phase facilities, normal Service to individual occupancies shall be 120/208 volt 3-wire single-phase (a five-terminal meter enclosure is required).
  - (c) Commercial Customers located in commercial/industrial areas shall be provided three-phase Service if it is currently available at the location and if loads warrant such Service. If three-phase service is requested and the above conditions are not satisfied, the Customer may be charged a CIAC.
4. The manner in which single-phase load is connected by the Customer is critical with three-phase service. On 208Y/120 volt or 480Y/277 volt "wye" three-phase Services, all single-phase loads should split evenly among the three phases. On 240/120 volt "delta" three-phase 4-wire services, all single-phase 120 volt loads shall be connected only to the 120 volt-to-ground legs. **NO SINGLE-PHASE LOAD SHALL BE CONNECTED PHASE TO GROUND TO THE HIGH LEG.** Connections made otherwise may result in damage to the Customer's equipment.
5. See **Figure 15** for standard metered services voltages.

## **F. INSPECTION**

1. The Customer's electric service installation including wiring and equipment shall be installed in accordance with the adopted edition of the N.E.C. and local ordinances.
2. All service installations shall be inspected and approved by the AHJ as required by law. The Company cannot connect any temporary or permanent electric service and set a meter until the Company has been notified by the AHJ that the proper inspections have been completed and approved. To avoid delay in getting service, please apply to Duke Energy for permanent service before the final inspection has been completed.
3. The Company shall make an inspection of the service installation to verify compliance with requirements of this book. If the service installation does not meet these requirements, the Company will refuse to connect the service. A reasonable effort will be made to notify the Customer of any changes required.
4. The Company may refuse to connect service to any new or altered installation which the Company or the AHJ considers unsafe. The Company may also disconnect service at any location that is unsafe or shows evidence of tampering or current diversion.
5. Temporary emergency restoration of service to an existing Customer service installation shall be made in accordance with the Company's rules and regulations and the AHJ.

## **G. ALTERATIONS AND ADDITIONS**

### For changes in permanent overhead or underground service

If the Customer's electrical service needs changing, additional load is being added, or electrical facilities need relocating, the Customer will need to update their service application information by contacting the Company as early in the planning process as possible. This allows the Company time to secure any additional rights of way, modify or build any needed lines and complete any other work required to meet the new electrical needs.

## **Requirements**

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.

2. Connection to the Customer's premises is made with facilities designed to properly supply adequate electric service 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 service and also that of other Customers supplied from the same facilities. Also, failure to provide adequate notice to the Company could subject the Customer to charges for any loss of or damage to the Company's 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 **Figure 15** shall apply.

5. When alterations require the relocation of any service equipment, the Customer shall make appropriate advance arrangements with the Company. When the Customer's part of the alterations have been satisfactorily completed and the necessary inspection approvals have been obtained, the Company shall make the connections to provide service. The Customer may incur a CIAC charge.

## **H. RIGHTS AND RESPONSIBILITIES**

1. The Company shall have the right of ingress to and egress from the Customer's premises for any and all purposes associated with the delivery of service including installing, removing, testing or replacing equipment and for reading meters.
2. All reasonable care shall be exercised by the Customer to prevent loss or damage to all property of the Company installed on the Customer's premises used in supplying service.
3. The Customer shall furnish the Company a satisfactory and lawful right of way over the premises for the Company's lines and apparatus necessary or incidental to the furnishing of service.
4. 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 piece of equipment belonging to the Company.

## **I. ELECTRICAL CONTRACTOR SEALING POLICY**

A licensed electrical Contractor must notify the Company the day before breaking and removing the meter seal to perform work, and must notify the Company immediately following any work so that Company can re-inspect the facilities and place a Company seal.

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

The Company may refuse or discontinue Service for certain reasons. Several of these reasons are listed below.

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. Tampering with meters or other facilities furnished and owned by the Company.
8. A hazardous condition is found by the Company.

## **K. Use of Company Rights-of-Way**

### **Distribution Line Rights-of-Way (less than 44KV)**

The Company's distribution easements cover overhead and underground facilities. The overhead facilities have a minimum width requirement of thirty (30) feet wide, extending fifteen (15) feet on each side of the center line of the electric facilities. The underground facilities have a minimum width requirement of ten (10) feet wide, extending five (5) feet on each side of the center line and ten (10) feet on each side of an electrical enclosure. Greater right-of-way widths may be required by Company engineering personnel under certain circumstances and will be stated on the easement form.

The property owner may use the right-of-way for other purposes, not in conflict with the easement rights granted or in violation of applicable safety codes. The Company's easement grants the Company the right to construct/install, operate, maintain, upgrade, clear, and access its facilities at all times.

Before constructing or placing structures near Company lines, the Customer must call the Customer Call Center to discuss the proposed plans with a Company representative to ensure that the Customer is not encroaching upon Company easement rights. Some encroachments may be allowed within the rights-of-way but must have proper Company approval prior to construction.

Call 811 or NC One Call **800-632-4949** or SC PUPS **888-721-7877** to ensure any electric line is located prior to digging or excavating.

### **Transmission Line Rights-of-Way (Voltages 44KV & higher)**

The Company's transmission lines have varying rights-of-way widths ranging from approximately 70 feet to over 300 feet in width and easement rights that cannot be encroached upon by others. Before any use of the transmission rights-of-way can be approved, the Customer must contact an Asset Protection Specialist through the Customer Service Center. Proposed plans must be reviewed, approved and meet all applicable Transmission Guidelines and Restrictions. This document can be accessed via the Duke Energy website at:

<http://www.duke-energy.com/safety/right-of-way-management.asp>

The Guidelines and Restrictions have been developed to answer the most frequently asked questions about property owner use of Duke Energy's electric transmission rights-of-way. Construction trailers, meter bases, pad mount transformers, temporary services, telephone and cable pedestals are a few examples that are not permitted within the transmission rights-of-ways. This list does not cover all restrictions or all possible situations. These restrictions are subject to change at any time and without notice. Duke Energy reserves all rights conveyed to it by the right-of-way agreement applicable to the subject property. Engineering plans may be required.

The Company's easement grants the Company the right to construct/install, operate, maintain, upgrade, clear, and access its facilities at all times. If the Company approves any use of the rights-of-way, it will be done in the form of a written agreement or a letter of "No Objection" via the local Transmission Asset Protection Specialist. If you have any additional questions or plan any activity within the transmission rights-of-way, call the Duke Energy Customer Care Center at **800-777-9898**.

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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 P.O.D. for each building. Exceptions may be allowed as noted in N.E.C. 230.2 and if agreed upon by the Company.
2. **P.O.D.:** For Service to each Customer, there is a definite P.O.D. at which the responsibility of Company ends and the responsibility of the Customer begins. Company will install, own, operate, and maintain all facilities on its side of the point of delivery and will have exclusive control of all electricity before it passes such P.O.D. The Customer will normally install, own, operate, and maintain all facilities (exclusive of metering equipment) on the Customer's side of the P.O.D. and will have exclusive responsibility for all electricity after it passes the P.O.D. The Customer will not own, install, operate or maintain any facilities on the Company's side of the P.O.D. The P.O.D. will be designated by the Company.
3. All Service Entrance facilities, including meter enclosures, shall be located in an exposed or readily accessible area.
4. Customer load wires shall never be installed in raceways that contain non-metered wires.
5. Grounds shall be established as required by the N.E.C., AHJ, and the Company.

#### 6. CONDUCTOR MARKING

- a. The "208 volt phase-to-ground" (high leg - right hand side, c position in the meter base) of each 240/120 volt 4-wire three-phase Service shall be clearly marked with an orange marking at the Point of Delivery and at the meter location or CT cabinet.
- b. Phase conductors other than the "high leg" phase shall be clearly marked with color markers at the P.O.D. 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.**

Note: The Company uses the following color notation for A, B, and C phase marking.

	<b><u>DEC / DEP</u></b>
208Y/120v Three phase	Red-Yellow-Blue
240/120v Three phase	Red-Yellow-Orange
480Y/277v Three phase	Red-Yellow-Blue

7. Customer conductor labeling for Multi-tenant metering:

Where one service is C.T. metered on the pad-mounted transformer **AND** other Customer-owned Services are run to the same transformer, **BUT** are metered elsewhere (i.e., on building wall or in meter room): both ends of **ALL** Customer cables must be clearly and specifically marked for phase **AND** labeled with a tag to identify the location of the source and load ends of the cable. The load end of each cable shall be labeled to identify the source. Each source end shall be labeled to identify the location of the load end of the cable (trough number, switch panel number, etc.). Refer to **Figure 3**.

8. Where three-phase Service is provided, the Company will provide phasing as follows: Random (either ABC positive sequence, Clockwise, OR CBA negative sequence, Counterclockwise) Customer must confirm and make any necessary adjustments once service is connected.

**B. TEMPORARY SERVICE\TEMPORARY CONSTRUCTION SERVICE**

- 1. **Temporary Service** is used when a Customer requests a Service that is not used for construction of a permanent structure that will receive permanent Service after construction is complete. An example would be a temporary sales lot used as a Christmas tree sales lot. Contact the local Company representative for details and charges.
- 2. **Temporary Construction Service** is used to provide power to a permanent structure under construction with the understanding that upon completion of that structure, permanent Service will be provided. For electric service of 120/240 volts, single phase, 200amps or less, there are no charges to the Customer if the overhead construction Service Drop is 100 feet or less, or no more than 2 feet of underground service lateral. Temporary Service for construction purposes (Temporary Construction Service) may be either overhead or underground depending upon



availability. Arrangements for providing temporary service/temporary construction service are shown in **Figure 1** and **Figure 2**.

## **C. OVERHEAD (OH) SERVICES**

1. It is the Customer's responsibility to provide a suitable support for attachment of the Service Drop conductors. See **Figures 8, 9A and 9B 10, 11, 12, and 13**. Customer is responsible for providing and installing an attachment point for the Service Drop conductors.
2. A minimum of two (2) feet 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 one (1) foot outside of the weatherhead.
3. For Service to mobile homes and other installations requiring overhead service equipment poles, refer to **Figures 9A and 9B**.
4. Thru-the-roof risers must be accessible to a Company bucket truck or Company extension ladder. Risers in excess of 72" above rooflines shall be accessible to Company bucket trucks.
5. The Customer may be charged a C.I.A.C. 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 (UG) SERVICES**

1. In certain areas where the Company has UG distribution, UG service shall be used, and OH Service shall not be available to the Customer.
2. For Service to mobile homes and other installations requiring underground service equipment poles, refer to **Figures 4A and 4B**.
3. 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.
4. The Customer is responsible for all necessary grass reseeding or application of sod or straw necessitated by the Company's initial installation of facilities.
5. The Customer is responsible for any abnormal construction costs such as, but not limited to, mechanical tamping, excessive hand digging, rock

removal, sidewalk boring, driveway and street boring, etc. Also, Customer is responsible for providing protection barriers for padmounted transformers whenever they are subject to vehicular traffic. (**Figure 61**)

6. Customer service conductors run to Company-owned padmounted transformers must be stubbed out within the allotted space. Refer to **Appendix C** (for DEP) or **Appendix D** (for DEC) for stub-out details. Refer to **Figure 58** for the maximum number and size of Customer conductors allowed in padmounted transformers. A secondary buss enclosure as defined by Company representative will be required if the Customer conductor count exceeds the maximum.
7. Customer service conductors run to Company-owned padmounted transformer terminals will be terminated by Company personnel. Each phase of parallel conductors will be cut the same length per N.E.C. Article 310.10 (H)(2). Marking of conductors should be placed on each conductor one foot above the conduit exist to ensure the marking is not cut off.
8. Any obstruction (on the wall, footer, etc.) which prevents installation of the Company's conduit shall be removed by the Customer.
9. Company's line extensions, including Services, shall be installed under the terms of the Company's filed rates and Tariffs.
10. The Customer shall request the Company to designate the P.O.D. for each service location before construction is started.
11. Special routing may incur additional cost to the Customer.
12. 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.
13. When converting residential overhead Service Drop to underground, provisions of the Company's filed rates and tariffs will apply. Additional costs may be required for boring sidewalks, driveways, roads/streets and other adverse conditions.

## **E. LIGHTING SERVICES**

A variety of lighting options, including standard, decorative, and flood, are offered by the Company for both residential and commercial/industrial applications. Contact the Customer Care Center at **866-769-6417** for further information and to talk to a Company representative.

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## SECTION IV

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### METERING INSTALLATIONS

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#### A. GENERAL REQUIREMENTS

##### 1. Jurisdictional Differences

**DEC** The Company shall furnish, own, and maintain all meters and transformer rated meter sockets. The Customer shall furnish, install, own and maintain all self-contained meter sockets, current transformer cabinets, transockets, and metering troughs.

**DEP** The Company shall furnish, own, and maintain all meters, transformer rated meter sockets, and some current transformer cabinets (See **Figure 43B** for details). The Customer shall furnish, install, own and maintain all self-contained meter sockets and metering troughs.

- It is the Customer's responsibility to furnish to the Company specific information on the type of service required such as overhead or underground, service voltage(s), main line switch amps, maximum demand amps and the number and size of the Customer's service entrance conductors.

**DEC** – Contact the local Duke Energy representative. For non-residential service the Customer must provide this information on a Load Sheet Form. A copy of the Load Sheet is shown in **Appendix A**.

**DEP** - Contact the local Company representative.

- A transformer-rated service from a three-phase padmount transformer serving a single Customer will be metered at the padmount transformer. The Customer will pull service conductors to the transformer (See **Figure 28**).
- A transformer-rated service from a single-phase padmount transformer serving a single Customer will be metered on the building wall (See **Figure 21**) or on an approved meter structure. Service conductors will be installed by the Company, or by the Customer, depending on the established P. O. D. as specified by Company Representative.
- For non-residential self-contained metered services or services to trough installations, the Company provides the underground service conductors from the padmount transformer to the P. O. D. (See **Figures 28, 47A, 47B, and 47C**).

6. The information below and in the chart on **Page 27** indicates the type of metering required for different service configurations. Company Representative will answer any questions about the type of service required for the installation.
- (a) On installations where the nominal voltage does not exceed 240 volts and the anticipated demand current does not exceed 200 amperes, an approved 200 ampere self-contained meter enclosure shall be used. See chart on **Page 27**.
- (b) On installations where the nominal voltage does not exceed 240 volts and the anticipated demand current is greater than 200 amperes but does not exceed 320 amperes continuous or 400 amperes maximum, an approved 400 ampere self-contained meter enclosure shall be used. A Class 320 meter shall be installed by the Company. See chart on **Page 27**.
- (c) On installations where the service voltage exceeds 240 volts or the Company determines the demand will exceed 320 amperes continuous or 400 amperes maximum for single phase or three phase services, instrument transformer metering shall be required. See chart on **Page 27**. No new 600 amp K-base installations will be connected.
- (d) See **SECTION IV, D** for more information on instrument transformer rated service installations
- (e) Refer to **Figure 21** for typical field applications of transformer-rated metering versus self-contained metering, single and three phase.

## Duke Energy Standard Metering Requirements for Various Service Voltages

Service Configuration	Meter Service Type		
	0 - 200 Amps	201-400 Amps	> 400 Amps
Three-wire, 120/240V Single Phase	Self-contained, 200 amp Four terminal Form 2S	Self-contained, 320 amp Four terminal Form 2S. (see note 1)	Transformer rated Five terminal Form 3S
Three-wire, 120/208V Network	Self-contained, 200 amp Five terminal Form 12S	Self-contained, 320 amp five terminal Form 12S. (see note 1)	Transformer rated Eight terminal Form 5S (45S)
Three-wire, 240V Delta Three Phase	DEC - Self-contained, Form 12S five terminal 200 Amp.	DEC – Self-contained, 320 amp five terminal Form 12S (see note 1)	Transformer rated Eight terminal Form 5S (45S)
	DEP – Self-contained, Form 16S seven terminal 200 Amp.	DEP – Self-contained, Form 16S seven terminal 320 Amp (see note 1)	
Three-wire, 480V Delta Three Phase	Transformer rated Eight terminal Form 5S (45S)	Transformer rated Eight terminal Form 5S (45S)	Transformer rated Eight terminal Form 5S (45S)
Four-wire, 240V High-leg Delta Three Phase	Self-contained, 200 amp Seven terminal Form 16S	Self-contained, 320 amp Seven terminal Form 16S (see note 1)	Transformer rated Thirteen terminal Form 9S
Four-wire, 120/208V Wye Three Phase	Self-contained, 200 amp Seven terminal Form 16S	Self-contained, 320 amp Seven terminal Form 16S (see note 1)	Transformer rated thirteen terminal Form 9S DEC - see note 2
Four-wire, 277/480V Wye Three Phase	Transformer rated thirteen terminal Form 9S DEC - see note 2 DEP - see note 3	Transformer rated thirteen terminal Form 9S DEC - see note 2	Transformer rated thirteen terminal Form 9S DEC - see note 2

### NOTES:

1. Meters and sockets rated for 400 amps maximum, 320 amps continuous.

2. For DEC services up to 600 amps where limited space prevents the installation of a CT cabinet and meter socket, a DEC-approved transocket may be used. See DEC transocket specifications on **Page 30**.
3. For DEP services, VT Pack metering shall be permitted under the conditions stated on **Figures 40 and 41**.
4. All meter jaws must be factory installed.
5. 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 either individual meter sockets (single or three phase) for trough installations as shown in **Figures 47A and 47B** or ganged meter sockets as described in Section IV-B and shown in **Figures 25, 26, and 27**.
  - b) Each meter socket will be labeled on the outside front and on the inside as shown in **Figure 3** correctly identifying the Customer served. Verification of correct labeling is the responsibility of the Customer.
  - c) On installations where the service voltage exceeds 240 volts or the Company determines the demand will exceed 320 amperes continuous or 400 amperes maximum for single phase or three phase services, instrument transformer metering shall be required. See chart of **Page 27**. No new 600amp K-base installations will be connected.
  - d) See SECTION IV, D for more information on instrument transformer rated service installations.
  - e) Refer to **Figure 21** for typical field applications of transformer metering versus self-contained metering, single and three phase.

## **B. CUSTOMER-PURCHASED EQUIPMENT**

1. Effective July 1, 2016, only self-contained meter sockets including individual meter sockets, ganged meter sockets, or multi-position meter centers that are on the Meter Equipment Group approved list may be used. In addition, all sockets and meter centers must comply with the mounting heights specified in this manual. The current list of MEG approved sockets is located on the Company website at the following locations:

2. The Customer shall be responsible for all maintenance of self-contained meter sockets
3. **DEC** - Duke Energy Carolinas Customer-owned CT cabinet and transocket guidelines and general specifications:  
Guidelines:
  - a. Customer furnishes and installs the CT cabinet. See **Figure 43A** for CT cabinet size and mounting guidelines. See following section below for construction requirements.
  - b. CT cabinets must be installed in the correct orientation for which they are designed. Cabinets mounted incorrectly can allow water to enter.
  - c. Additional space must be planned for the installation of the meter socket. Center of meter must be between 3 feet and 6 feet above final grade. Duke Energy technician will install the meter socket.
  - d. See **Figure 14B** for grounding requirements.
  - e. Customer will cut hole in the CT cabinet for Duke Energy's riser for underground service. Hole must be positioned at opposite end of cabinet from Customer conductors and be sized per the chart in **Figure 43A**.
  - f. Customer load side conductors should enter the cabinet from one side only.
  - g. Please consult Duke Energy Field Metering prior to construction for any questions or unusual circumstances.

General CT Cabinet Construction Specifications:

1. All CT cabinets:
  - (a) All CT cabinets shall be designed, manufactured and tested in accordance with the specifications given in the latest revision of the National Electrical Code and Underwriters Laboratories Inc. Standard for Safety UL-50.
  - (b) All CT cabinets shall have a backboard made of ¾-inch-thick plywood affixed to the inside of the back CT cabinet wall with stainless steel screws or bolts. The backboard is for mounting instrument transformers. Other means can be provided for mounting CTs if determined by Duke Energy to be safe and offering sufficient mounting options.
  - (c) There shall be a grounding/bonding lug on the inside of the CT cabinet. See **Figure 14B** for grounding requirements.

- (d) All CT cabinets shall have a latch assembly to accept a padlock-type seal and can be accommodated according to ANSI C-12.7.

2. CT cabinet 1:

- (a) Rectangular CT cabinet 32 inches wide by 24 inches high by 12 inches deep minimum dimensions with lift-off cover and mounting provisions for instrument transformers as specified above.
- (b) The enclosure shall be constructed using a minimum of .056-inch galvanized sheet steel bonderized with a zinc coating or .080-inch sheet aluminum.
- (c) The front cover shall be lift-off type. The interior shall have door stops to prevent inward deflection of the front cover.
- (d) The enclosure shall have two sealing facilities at the bottom of the cover.

3. CT cabinet 2:

- a. Square CT cabinet 40 inches wide by 40 inches high by 14 inches deep minimum dimensions with double-hinged doors and mounting provisions for instrument transformers as specified above in **Item 1**.
- (b) The enclosures shall be constructed using a minimum of .063-inch galvanized sheet steel bonderized with a zinc coating or .090-inch sheet aluminum.
- (c) The enclosure shall have double doors with a minimum of two hinges per door. The double doors shall have a three-point latch operated by a single handle that can be secured by a padlock.
- (d) There shall be a mechanism provided for holding the doors open greater than 90 degrees from the closed position.

4. CT cabinet 3:

- (a) Square CT cabinet 60 inches wide by 60 inches high by 18 inches deep minimum dimensions with double-hinged doors and



mounting provisions for instrument transformers as specified above in **Item 1**.

- (b) The enclosures shall be constructed using a minimum of .063-inch galvanized sheet steel bonderized with a zinc coating or .090-inch sheet aluminum.
- (c) The enclosure shall have double doors with a minimum of two hinges per door. The double doors shall have a three-point latch operated by a single handle that can be secured by a padlock.
- (d) There shall be a mechanism provided for holding the doors open greater than 90 degrees from the closed position.

5. Transocket specification:

- (a) All transockets must be 13 terminal sockets for four-wire wye services, 120/208 V or 277/480 V, 600 amp maximum. Transockets must be pre-approved for use on the DEC system. Transockets approved for use are Meter Devices Model: 683U3690-T092.
- (b) All transockets shall meet the requirements for Underwriters Laboratories Inc. Standard for Safety UL-50.
- (c) All transockets shall have a backboard made of ¾-inch-thick plywood affixed to the inside of the back wall with stainless steel screws or bolts. The backboard is for mounting instrument transformers. Other means can be provided for mounting CTs if determined by Duke Energy to be safe and offering sufficient mounting options.
- (d) There shall be a grounding lug attached to the inside of the transocket capable of accepting #14 to #2 copper or aluminum conductors.
- (e) All transockets shall have a latch assembly to accept a padlock-type seal and can be accommodated according to ANSI C-12.7.
- (f) All transocket dimensions must be a minimum of 25 inches wide by 33 inches high by 12 inches deep.

## 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. Meters shall be located in a place where they shall be protected from mechanical damage. The Customer shall be responsible for providing this protection.
3. 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.
4. Meter enclosures shall not be recessed or framed in any way that blocks access, knockouts or drainage.
5. The centerline of the meter shall not be more than 6 feet or less than 3 feet from the ground (final grade) or floor. For meter centers, the height of the bottom meter socket shall not be less than 30 inches. (See **Figure 27**)

Exception: In flood zones where the requirements mandate that the meter be located above 6 feet from grade, ready and permanent accessibility to the meter (including the working space described in item No. 6 in this section) shall be provided for reading and testing. See **Figure 5**.

6. A clear space at least 30 inches wide (or equipment width whichever is greater) by 42 inches deep by 78 inches high from final grade must be provided and always be available around every meter for reading, inspecting, testing and maintenance operations. Clear space for safe access to and egress from the working space must be maintained.
7. Meters shall be installed outdoors or in a meter room as described in No. 10 within this section. In developed downtown urban areas, meters may be located indoors with the approval of Company representative prior to installation.
8. Meters for single-family residences shall always be located outdoors. 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.

9. In the event a meter is later enclosed or otherwise made inaccessible or unsafe, the Customer shall, at the Customer's expense, have the meter facilities moved to a readily accessible outside location.
10. Meters may be grouped together in a meter room furnished by the Customer provided the following requirements are met:
  - (a) A single meter room should normally be located on the first floor. For buildings above three floors, a single meter room may be located on various floors at mutually agreeable locations. Any exceptions to this due to unusual distances, etc., must be approved by your Duke Energy project engineer.
  - (b) The Company shall have access to the meter rooms for reading, testing and servicing the equipment. When meters are located in areas that can be locked, the Customer shall make arrangements to provide the Company access to the meters. The Customer shall provide a lock box to accommodate a standard key or a magnetic access card. The lock box will be installed by the Customer.
  - (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 restrooms, 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 that prohibit safe 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. INSTRUMENT TRANSFORMER INSTALLATIONS**

1. The use of instrument transformers shall be determined by the Company as described in **SECTION IV A(5)**.
2. It is very important to both the Company and the Customer that the

instructions and construction details shown in **Figures 14B, 21, 43A, and 43B** are followed closely on all instrument transformer installations.

3. The facilities necessary for instrument transformer installations shall be provided and installed as described below:
  - (a) The Company shall provide the instrument transformers, instrument transformer secondary wiring, meter enclosure and meter.
  - (b) **DEC** - The Customer shall provide and install the current transformer cabinets.
  - DEP**-The Customer shall install the current transformer cabinets provided.
4. Instrument transformer installations are usually made by one of the means listed below, 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.
  - (b) Instrument 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) Necessary meter wiring shall be installed and connected by the Company's meter technician.
  - (c) Services may have wall mounted or riser mounted overhead current transformers.
  - (d) **DEP** - On 480Y/277V three phase installations where the anticipated demand current does not exceed 200 amperes, VT pack metering shall be permitted under the conditions stated on **Figures 40 and 41**. This service is mainly for mall applications where space is at a premium.
5. A clear space at least 30 inches wide (or equipment width whichever is greater) by 42 inches deep by 78 inches high from final grade must

be provided and always be available around every meter for reading, inspecting, testing and maintenance operations. Clear space for safe access to and egress from the working space must be maintained.

## **E. DEP ONLY - SURGE ARRESTERS**

1. Surge arresters (whether Company-owned or Customer-owned) may be installed as depicted on **Figure 46** provided the installation meets 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 must comply with applicable ANSI/IEEE, UL or other nationally recognized testing laboratory (NRTL) safety standards.
3. See **Figure 45** For additional conditions associated with devices installed between the meter and meter socket.

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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 N.E.C. 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. The Company's revenue meter location shall be within 25' of the instrument transformers on the same floor level.

5. Fire suppression systems should not be installed in Company equipment vaults unless specifically required by local authorities and then must be approved by the Company. Liquid sprinkler systems of any kind are not allowed.
6. 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 conduits within the building for Company's facilities, including primary and/or secondary conductors. Such conduits shall extend beyond the outside building wall to a point designated by the Company.
  - d. Access means including elevators and/or hoists where necessary, such that transformers and equipment can be moved 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 conduits. 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 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 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 so 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 (See **SECTION VII**).
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.**

#### B. MOTORS

When a Customer's motor starting causes objectionable flicker to other Customers, 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.

Where large motors using a converter-inverter are installed on single- phase distribution systems to provide three-phase power for the motor, harmonic filters will need to be installed. These large single- phase non-linear loads will cause excessive 3<sup>rd</sup> harmonic current flows on the utility system without such filters. Note that Item **C 2.** in the following section also applies to large motor loads.

## C. SPECIAL EQUIPMENT

1. Due to the very severe operating characteristics of such equipment as electric welders (particularly of the transformer type), furnaces, tankless water heaters, X-ray machines, and radio and television broadcasting stations, the Customer shall consult with the Company before installation is made.
2. 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.
3. When a Customer generates an unacceptable level of harmonic distortion, the Customer shall, at the Customer's expense, be required to install equipment necessary to reduce this distortion. If a single non-linear load is greater than 500 kVA, or if an aggregate load is greater than 85% non-linear, contact 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, switch mode power supplies, variable speed drives, computers, laser printers, etc.
4. Upon request, the Company can provide energy demand and consumption information. This can be in the form of meter pulse information (also known as dry contacts) or through software based programs such as Energy Profiler Online. Depending upon the Customer's location and the specifics of their delivery, there may be a charge for this information that covers the additional equipment needed to provide the data. For further information, contact the Customer Care Center in your area (either Duke Energy Carolinas or Duke Energy Progress).
5. Customer-owned instrument transformers shall not be permitted to be installed on or connected to Company facilities, including the instrument transformers, pad-mounted transformer, or Company metering enclosure.



## D. GENERATORS

### 1. Emergency and Standby Generators:

- Transfer switches must be “break-before-make” or must be “Fast Transition” ( parallel time  $\leq$  to 100 milliseconds). See **Figures 73A and 74** for specific requirements.
- For systems that will parallel for more than 100 milliseconds (“Soft Transition”), see **Figures 73A and 73B** for specific requirements.

### 2. Long Term 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. Before any interconnection is established, the Customer shall contact the Company's Representative 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. (See **Figures 63-71, 75A, 75B, and 75C** for Sell-All metering configurations.)

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## SECTION VII

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### FAULT CURRENT (For Equipment Sizing Only)

The Company has calculated the maximum fault current that can be delivered to the secondary terminals of standard padmounted transformers (utilizing the infinite buss methodology) as shown in the following tables. Fault current values are provided at the secondary terminals of the Company transformer. Contact your local Company representative, who will determine the size and voltage of the padmounted transformer. From there, select the fault current value from the tables.

For installations involving overhead pole-mounted transformers or underground installations with Duke Energy-provided secondary service conductors, contact your local Company representative for specific fault current data.

### ARC FLASH

The following fault current tables **SHALL NOT** be utilized in arc flash analysis. In order to provide our Customers with electrical data to perform arc flash studies, Duke Energy must receive such requests, in writing, directly from an authorized employee of the Customer's Company or governmental entity. In order to protect the confidentiality of Customer electric service deliveries, Duke Energy will not accept requests directly from consulting engineers or electricians.

Refer to **Appendix E** for an example of a sample letter to be used for such requests. Requests can be received in electronic or written format, but either should contain at a minimum the service information shown in **Appendix E**. Contact the Duke Energy Customer Care Center at **800-777-9898** for assistance in beginning this process.

## FAULT CURRENT TABLES

Maximum Fault Current - 3 Phase - 208Y/120v - PMT				
KVA	Voltage	Min Z%	X/R	3 Phase Fault
75	208Y/120	1.60	1.4	13,010
150	208Y/120	2.00	2.0	20,820
225 (DEC ONLY)	208Y/120	3.00	2.6	20,820
300	208Y/120	3.50	5.1	23,800
500	208Y/120	2.80	4.8	49,570
750	208Y/120	5.32	6.5	39,130
1000	208Y/120	5.32	6.8	52,180
1500 (DEP ONLY)	208Y/120	5.32	7.6	78,260

Maximum Fault Current - 3 Phase – 4160Y/2400v - PMT				
KVA	Voltage	Min Z%	X/R	3 Phase Fault
2500 (DEP ONLY)	4160/2400	5.32	10.7	6,520

<b>Maximum Fault Current - 3 Phase - 480Y/277v –PMT</b>				
KVA	Voltage	Min Z%	X/R	3 Phase Fault
75	480Y/277	1.60	1.7	5,640
150	480Y/277	2.00	2.3	9,020
225 (DEC ONLY)	480Y/277	3.00	3.5	9,020
300	480Y/277	3.50	5.3	10,310
500	480Y/277	2.80	3.5	21,480
750	480Y/277	5.32	7.1	16,960
1000	480Y/277	5.32	7.3	22,610
1500	480Y/277	5.32	7.9	33,910
2000 (DEC ONLY)	480Y/277	5.32	8.6	45,220
2500	480Y/277	5.32	9.4	56,520
3750 (DEP ONLY)	480Y/277	5.32	8.0	84,780

<b>Maximum Fault Current - 3 Phase - 208Y/120v – VAULT—DEP ONLY</b>				
KVA	Voltage	Min Z%	X/R	3 Phase Fault
500	208Y/120	2.23	2.4	62,240
750	208Y/120	5.83	7.1	35,710
1000	208Y/120	5.60	6.8	49,570

<b>Maximum Fault Current - 3 Phase - 480Y277v – VAULT—DEP ONLY</b>				
KVA	Voltage	Min Z%	X/R	3 Phase Fault
500	480Y/277	3.22	3.3	18,680
750	480Y/277	5.94	7.4	15,190
1000	480Y/277	6.06	7.7	19,850
1500	480Y/277	5.70	8.5	31,650
2500	480Y/277	5.81	9.3	51,760

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NOTE: FIGURES APPLY TO DEC AND  
 DEP UNLESS NOTED OTHERWISE IN  
 JURISDICTION BLOCK OR IN FIGURE



3				
2				
1	6/29/16	EANES	FLETCHER	ADCOCK
0	1/19/16	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

## SERVICE REQUIREMENTS FIGURES

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DEC	DEM	DEP	DEF
X		X	
TOC A			

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NOTE: FIGURES APPLY TO DEC AND  
DEP UNLESS NOTED OTHERWISE IN  
JURISDICTION BLOCK OR IN FIGURE

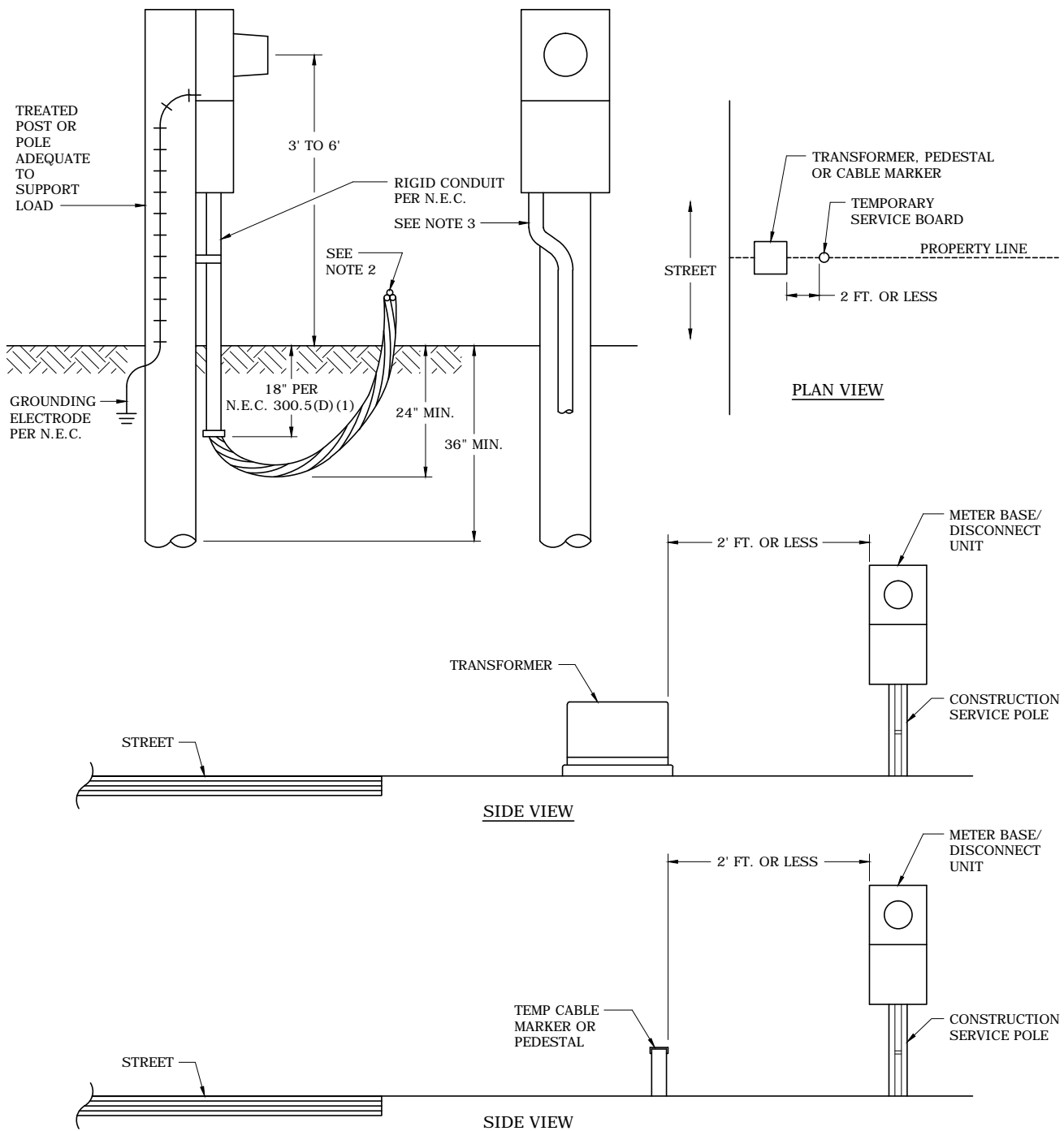


3				
2				
1	8/3/16	EANES	FLETCHER	ADCOCK
0	1/8/16	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

## SERVICE REQUIREMENTS FIGURES

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DEC	DEM	DEP	DEF
X		X	
TOC B			



**NOTES:**

1. CUSTOMER FURNISHES ALL ITEMS EXCEPT METER. INSTALLATION IS TO BE MADE BY ELECTRICIAN TO MEET N.E.C. AND LOCAL ORDINANCES.
2. CUSTOMER'S ELECTRICIAN TO SUPPLY SUITABLE CONDUCTORS (SEPARATE CONDUCTORS - NO SHEATHED CABLES!) FROM SOURCE SIDE LUGS OF METER BASE TO 5' MINIMUM BEYOND END OF CONDUIT RISER. CONDUCTOR ENDS TO BE CAPPED TO PREVENT WATER ENTRY.
3. CONDUIT TO BE INSTALLED IN DESIGNATED SPACE IN PANEL AS REQUIRED BY N.E.C. 230.7.
4. TYPICAL SERVICE IS 120/240V SINGLE-PHASE 10KW MAXIMUM.

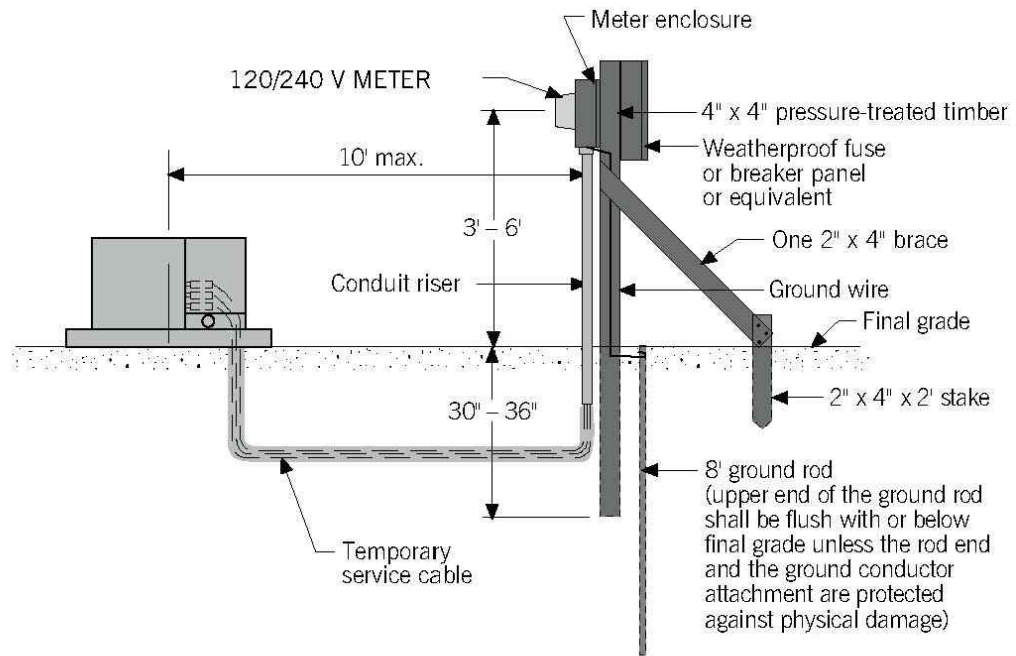
8				
7				
6				
0	1/13/16	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

**CONSTRUCTION/TEMPORARY SERVICE POLE  
FOR URD AREAS**



DEC	DEM	DEP	DEF
		X	

**FIG 1A**



NOTE:

STANDARD TEMPORARY CONSTRUCTION SERVICE IN AN UNDERGROUND FACILITY IS AVAILABLE WITHIN 10 FEET OF EXISTING POWER FACILITIES (PADMOUNT TRANSFORMERS OR UNDERGROUND PEDESTALS).

- Customer furnishes and installs
- Duke Energy furnishes and installs

3				
2				
1				
0	2/12/16	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

TEMPORARY UNDERGROUND CONSTRUCTION  
SINGLE-PHASE SERVICE POST

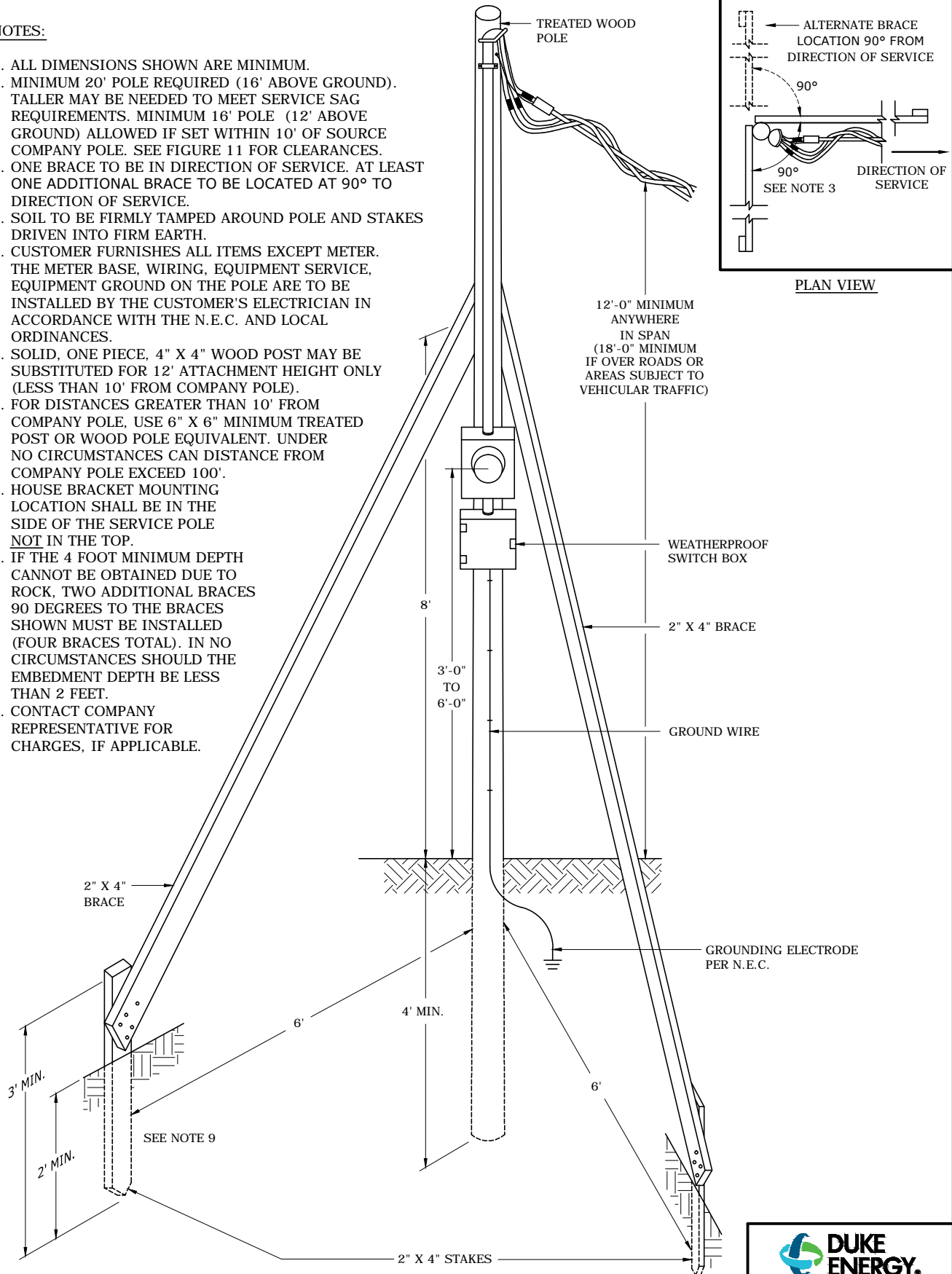


DEC	DEM	DEP	DEF
X			
FIG 1B			



**NOTES:**

1. ALL DIMENSIONS SHOWN ARE MINIMUM.
2. MINIMUM 20' POLE REQUIRED (16' ABOVE GROUND). TALLER MAY BE NEEDED TO MEET SERVICE SAG REQUIREMENTS. MINIMUM 16' POLE (12' ABOVE GROUND) ALLOWED IF SET WITHIN 10' OF SOURCE COMPANY POLE. SEE FIGURE 11 FOR CLEARANCES.
3. ONE BRACE TO BE IN DIRECTION OF SERVICE. AT LEAST ONE ADDITIONAL BRACE TO BE LOCATED AT 90° TO DIRECTION OF SERVICE.
4. SOIL TO BE FIRMLY TAMPED AROUND POLE AND STAKES DRIVEN INTO FIRM EARTH.
5. CUSTOMER FURNISHES ALL ITEMS EXCEPT METER. THE METER BASE, WIRING, EQUIPMENT SERVICE, EQUIPMENT GROUND ON THE POLE ARE TO BE INSTALLED BY THE CUSTOMER'S ELECTRICIAN IN ACCORDANCE WITH THE N.E.C. AND LOCAL ORDINANCES.
6. SOLID, ONE PIECE, 4" X 4" WOOD POST MAY BE SUBSTITUTED FOR 12' ATTACHMENT HEIGHT ONLY (LESS THAN 10' FROM COMPANY POLE).
7. FOR DISTANCES GREATER THAN 10' FROM COMPANY POLE, USE 6" X 6" MINIMUM TREATED POST OR WOOD POLE EQUIVALENT. UNDER NO CIRCUMSTANCES CAN DISTANCE FROM COMPANY POLE EXCEED 100'.
8. HOUSE BRACKET MOUNTING LOCATION SHALL BE IN THE SIDE OF THE SERVICE POLE NOT IN THE TOP.
9. IF THE 4 FOOT MINIMUM DEPTH CANNOT BE OBTAINED DUE TO ROCK, TWO ADDITIONAL BRACES 90 DEGREES TO THE BRACES SHOWN MUST BE INSTALLED (FOUR BRACES TOTAL). IN NO CIRCUMSTANCES SHOULD THE EMBEDMENT DEPTH BE LESS THAN 2 FEET.
10. CONTACT COMPANY REPRESENTATIVE FOR CHARGES, IF APPLICABLE.



OVERHEAD TEMPORARY CONSTRUCTION SERVICE POLE

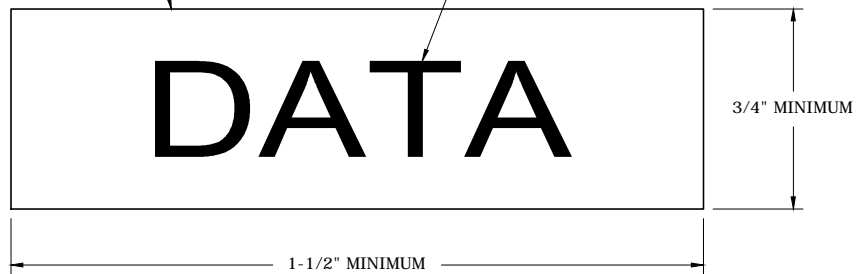
DEC	DEM	DEP	DEF
X		X	

FIG 2

3				
2				
1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

MINIMUM 1/16" THICK

MINIMUM 1/2" HIGH LETTERS



NOTES:

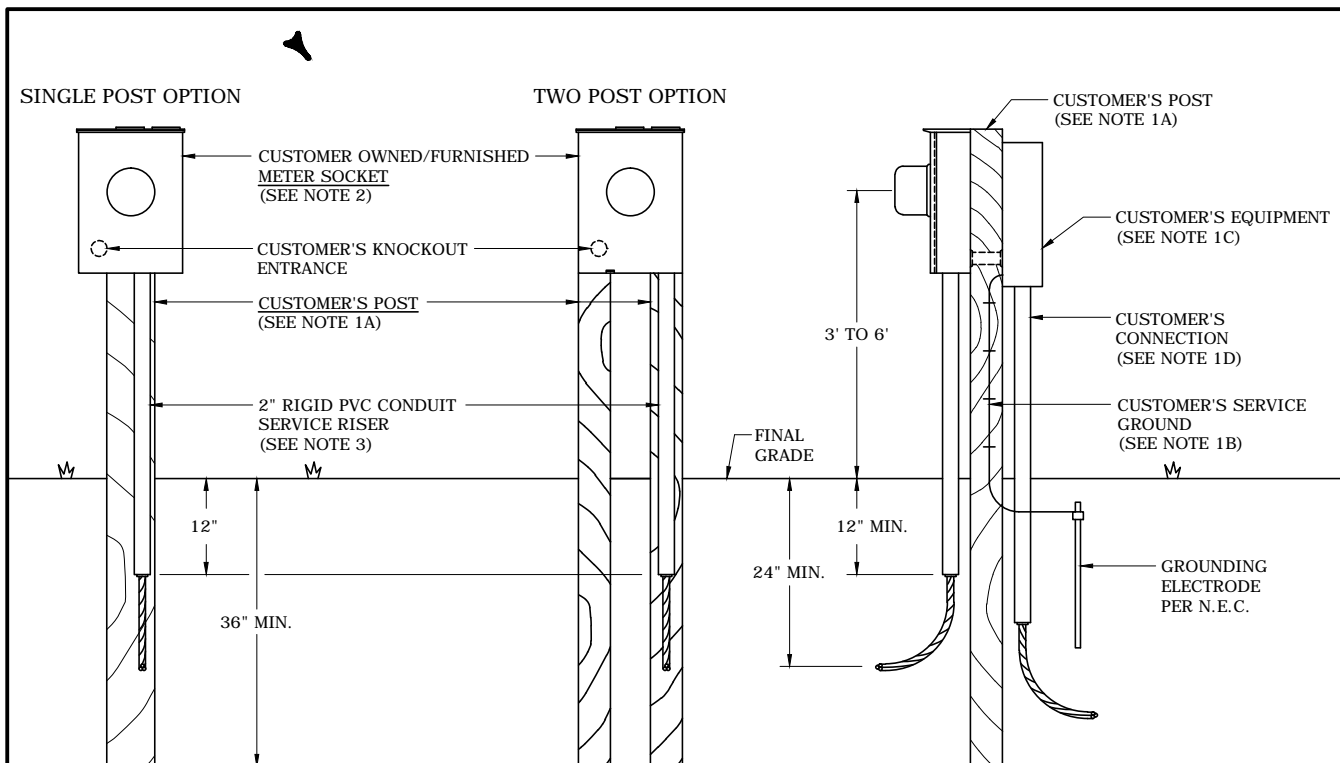
1. ON INSTALLATIONS, REPAIRS, REPLACEMENTS OR UPGRADES OF ENCLOSURES INVOLVING MORE THAN ONE METER ON A SINGLE PREMISE, THE CUSTOMER SHALL CORRECTLY IDENTIFY EACH METER ENCLOSURE ON THE OUTSIDE BY A NONFERROUS METAL OR PLASTIC PLATE ENGRAVED OR STAMPED WITH THE APARTMENT NUMBER, OFFICE SUITE, LOT NUMBER, ETC.
2. THE PLATE SHALL BE PERMANENTLY ATTACHED TO THE METER ENCLOSURE UTILIZING AN INDUSTRIAL-STRENGTH ADHESIVE SUITABLE FOR EXTERIOR USE. TWO-SIDED TAPE IS NOT ACCEPTABLE.
3. THE INSIDE OF EACH METER ENCLOSURE SHALL BE CORRECTLY IDENTIFIED WITH A PLATE DESCRIBED ABOVE OR WITH A PERMANENT MARKER.



3				
2				
1				
0	10/28/15	SIMPSON	EVANS	CHANDLER
REVISED	BY	CK'D	APPR.	

METERING ENCLOSURE LABELING  
ON A SINGLE PREMISE

DEC	DEM	DEP	DEF
X		X	X
FIG 3			



#### CUSTOMER INSTALLATION

##### 1. CUSTOMER WILL FURNISH AND INSTALL:

- (A) ONE 4" X 6", 6" X 6" OR TWO 4" X 4" TREATED POSTS SUITABLE TO COMPANY.\*
- (B) SERVICE GROUND IN ACCORDANCE WITH N.E.C.
- (C) ALL EQUIPMENT, MOUNTING HEIGHTS, AND CLEARANCES BEYOND THE METER SOCKET IN ACCORDANCE WITH N.E.C.
- (D) ALL CONNECTIONS IN ACCORDANCE WITH N.E.C.
- (E) MOBILE HOME SERVICES - POSTS SHALL BE INSTALLED 18" MIN. FROM THE MOBILE HOME FOR MOUNTING THE SERVICE RISER, METER SOCKET, AND SERVICE EQUIPMENT. METERING EQUIPMENT SHALL FACE AWAY FROM MOBILE HOME SUCH THAT METER IS EASILY READABLE AND ACCESSIBLE. OTHER CONSTRUCTION IS PERMISSIBLE WITH LOCAL ENGINEER'S APPROVAL.

##### 2. CUSTOMER WILL FURNISH, INSTALL, AND OWN METER SOCKET. TOP OF SOCKET MUST BE LEVEL FRONT TO FRONT TO BACK AND SIDE TO SIDE.

#### COMPANY INSTALLATION

- 3. COMPANY WILL PROVIDE AND INSTALL THE UNDERGROUND SERVICE LATERAL ACCORDING TO COMPANY'S STANDARD PRACTICES.
- 4. BOTTOM OF TRENCH MUST BE FIRMLY TAMPED NEAR POST. CABLE MUST BE POSITIONED FIRMLY AGAINST TAMPED EARTH DURING BACKFILLING. BEFORE CABLE IS CUT AFTER BACK-FILLING, PUSH CABLE DOWN IN CONDUIT TO PROVIDE AS MUCH SLACK AS POSSIBLE. THIS IS NECESSARY TO PREVENT SETTLING OF EARTH FROM PULLING ON CABLE AND DAMAGING METER BASE TERMINALS.
- 5. POINT OF DELIVERY IS WHERE COMPANY'S CONDUCTORS ATTACH TO METER SOCKET.

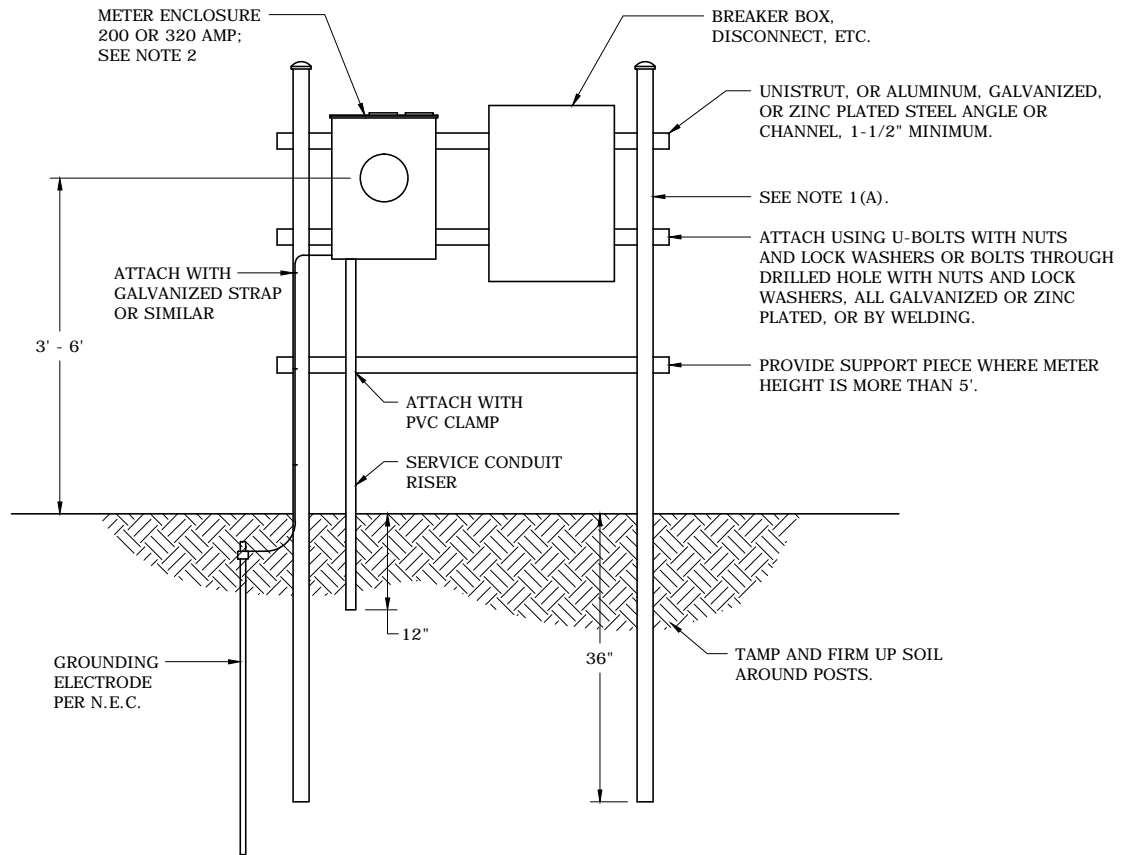
\*SOME COUNTIES WITHIN COMPANY'S SERVICE AREA REQUIRE THE USE OF (ONE) SINGLE 4" X 6" OR 6" X 6" POST.



3				
2				
1	6/29/16	EANES	FLETCHER	ADCOCK
0	2/1/16	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

#### UNDERGROUND PERMANENT SERVICE POST MOUNTED

DEC	DEM	DEP	DEF
X		X	
FIG 4A			



#### CUSTOMER INSTALLATION

##### 1. CUSTOMER WILL FURNISH AND INSTALL:

- (A) H FRAME POSTS CAN BE 2-3/8" PIPE OR LARGER WITH END CAPS, 2" (OD) OR LARGER TUBING WITH END CAPS, OR 2" OR LARGER CHANNEL, OR EQUIVALENT, ALL GALVANIZED, ZINC PLATED, OR ALUMINUM.
- (B) SERVICE GROUND IN ACCORDANCE WITH N.E.C.
- (C) ALL EQUIPMENT, MOUNTING HEIGHTS, AND CLEARANCES BEYOND THE METER SOCKET IN ACCORDANCE WITH N.E.C.
- (D) ALL CONNECTIONS IN ACCORDANCE WITH N.E.C.
- (E) MOBILE HOME SERVICES - H FRAME SHOULD BE INSTALLED 18" MIN. FROM THE MOBILE HOME FOR MOUNTING THE SERVICE RISER, METER SOCKET, AND SERVICE EQUIPMENT. METERING EQUIPMENT SHALL FACE AWAY FROM MOBILE HOME SUCH THAT METER IS EASILY READABLE AND ACCESSIBLE. OTHER CONSTRUCTION IS PERMISSIBLE WITH LOCAL ENGINEER'S APPROVAL.

##### 2. CUSTOMER WILL FURNISH, INSTALL, AND OWN METER SOCKET. TOP OF SOCKET MUST BE LEVEL FRONT TO FRONT TO BACK AND SIDE TO SIDE.

#### COMPANY INSTALLATION

##### 3. COMPANY WILL PROVIDE AND INSTALL THE UNDERGROUND SERVICE LATERAL ACCORDING TO COMPANY'S STANDARD PRACTICES.

##### 4. BOTTOM OF TRENCH MUST BE FIRMLY TAMPED NEAR H-FRAME. CABLE MUST BE POSITIONED FIRMLY AGAINST TAMPED EARTH DURING BACKFILLING. BEFORE CABLE IS CUT AFTER BACK-FILLING, PUSH CABLE DOWN IN CONDUIT TO PROVIDE AS MUCH SLACK AS POSSIBLE. THIS IS NECESSARY TO PREVENT SETTLING OF EARTH FROM PULLING ON CABLE AND DAMAGING METER BASE TERMINALS.

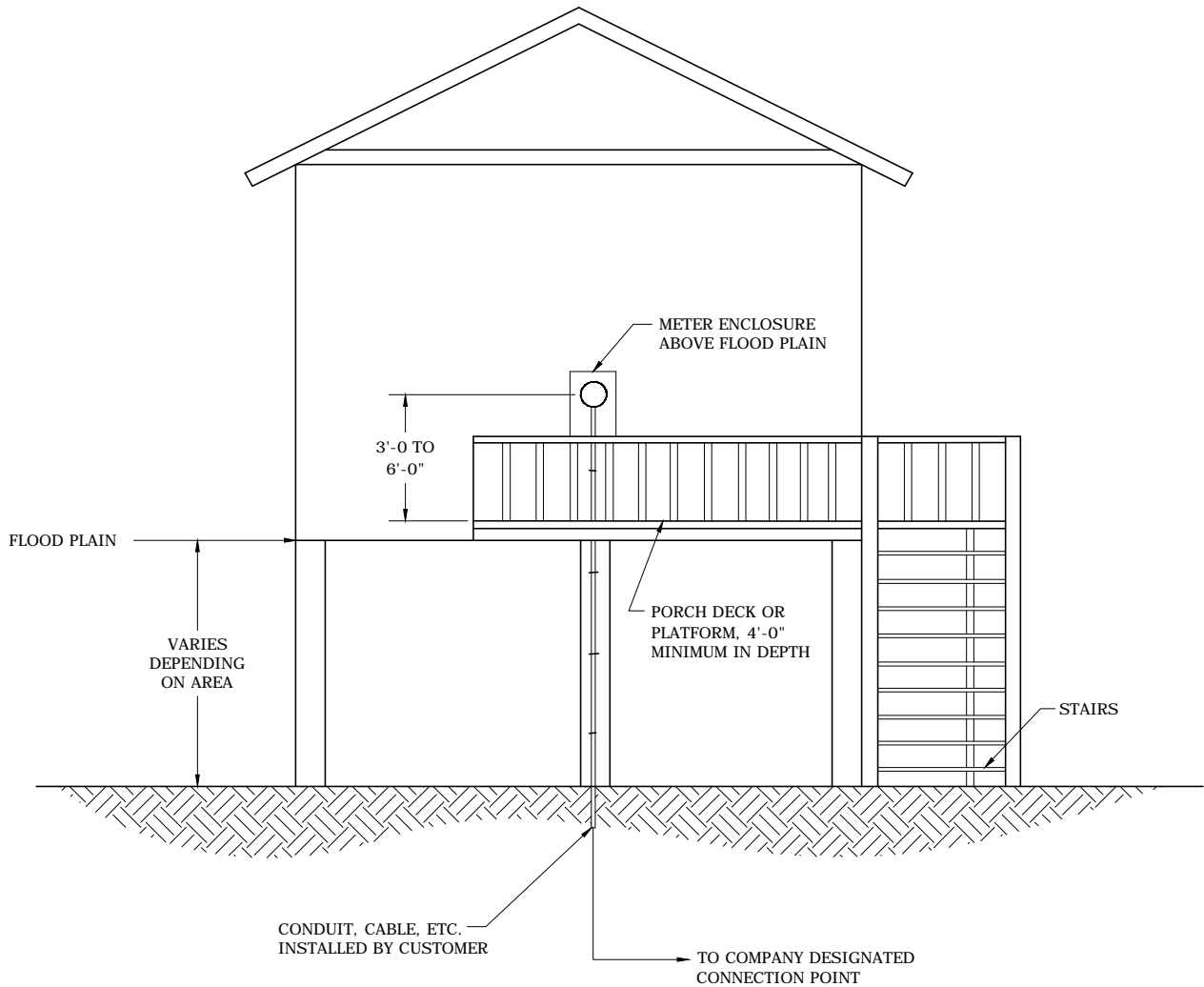
##### 5. POINT OF DELIVERY IS WHERE COMPANY'S CONDUCTORS ATTACH TO METER SOCKET.



3				
2				
1				
0	10/6/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

#### UNDERGROUND PERMANENT SERVICE H FRAME STRUCTURE MOUNTED

DEC	DEM	DEP	DEF
X		X	
FIG 4B			



**NOTES:**

1. ELECTRICAL SERVICES IN FLOOD ZONES MUST BE ELEVATED ABOVE THE FLOOD PLAIN ELEVATION, AND ACCESS AND WORKING CLEARANCES MUST COMPLY WITH N.E.C. ARTICLE 110.
2. ALL PLATFORM AND STAIR CONSTRUCTION SHALL BE PROVIDED BY THE CUSTOMER AS REQUIRED BY COMPANY AND MUST MEET ALL APPLICABLE BUILDING CODES.
3. NO SHIPS LADDERS OR HOMEMADE LADDERS WILL BE APPROVED.
4. CONDUIT (SCHEDULE 40), SERVICE RISER, ATTACHMENT MEANS AND SERVICE CONDUCTORS ARE TO BE PROVIDED AND INSTALLED BY CUSTOMER.

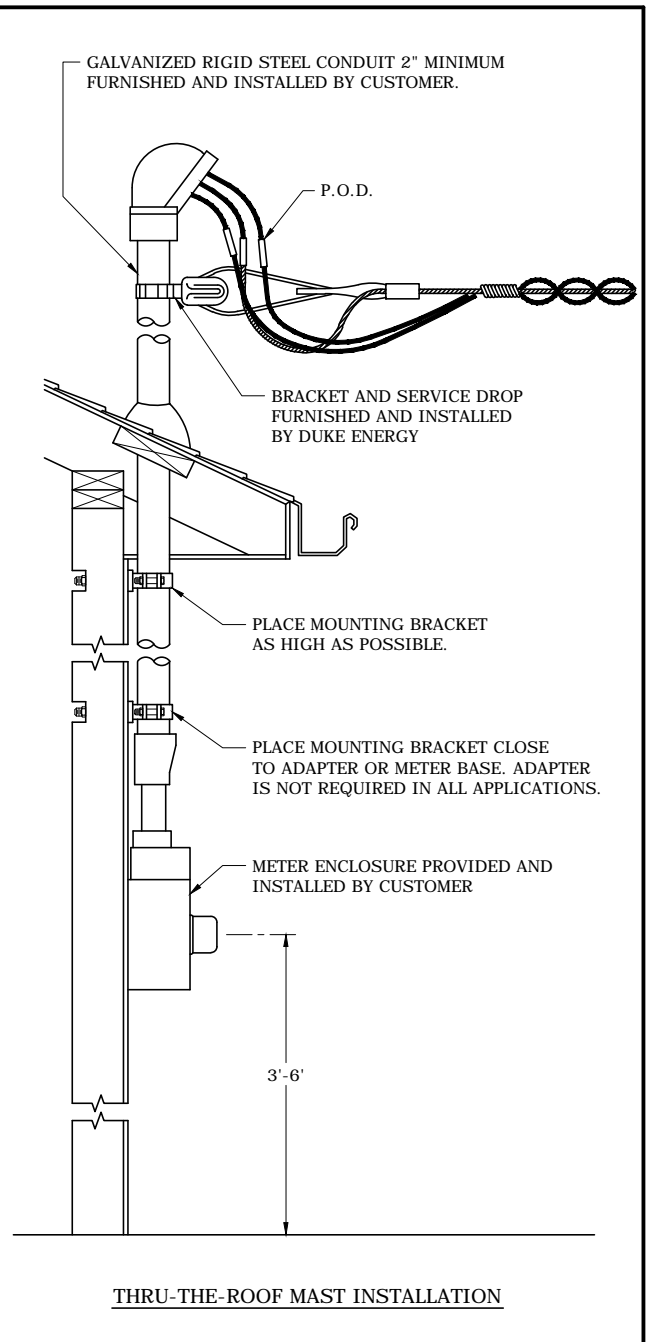
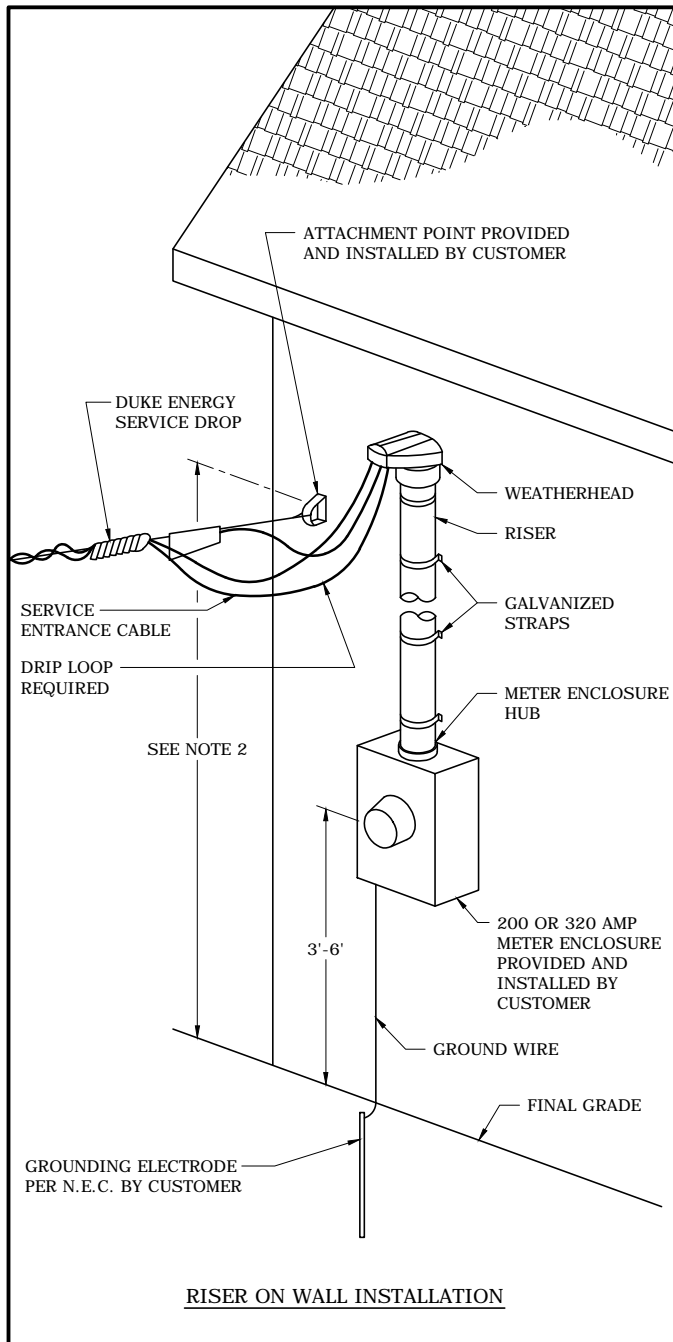
3				
2				
1				
0	1/13/16	SIMPSON	EANES	CHANDLER
REVISED	BY	CK'D	APPR.	

**METER ENCLOSURE INSTALLATIONS  
IN FLOOD ZONES**



DEC	DEM	DEP	DEF
X		X	

**FIG 5**



NOTES:

1. SEE FIGURE 14A FOR METER ENCLOSURE GROUNDING DETAILS.
2. SEE FIGURES 10 AND 11 FOR SERVICE DROP CLEARANCES.
3. CUSTOMER PROVIDES AND INSTALLS ALL ITEMS EXCEPT METER AND SERVICE DROP, EXCEPT AS NOTED ABOVE.
4. THRU-THE-ROOF RISERS MUST BE ACCESSIBLE TO A COMPANY BUCKET TRUCK OR A COMPANY EMPLOYEE ON AN EXTENSION LADDER NOT TO EXCEED 25' ABOVE GRADE.
5. RISERS IN EXCESS OF 72" ABOVE ROOF LINES SHALL BE ACCESSIBLE TO A COMPANY BUCKET TRUCK.

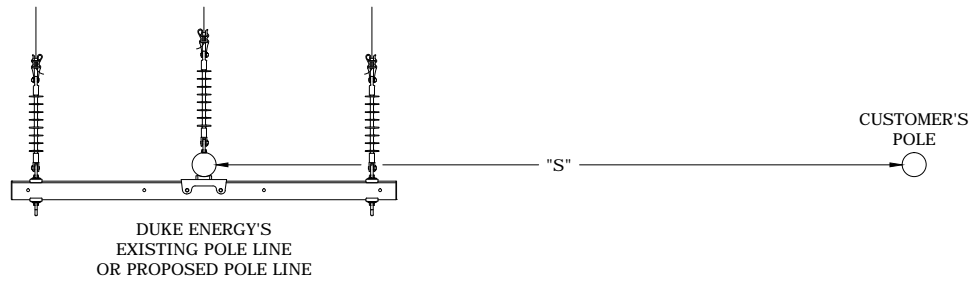
3				
2				
1				
0	1/19/16	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

RESIDENTIAL PERMANENT OVERHEAD

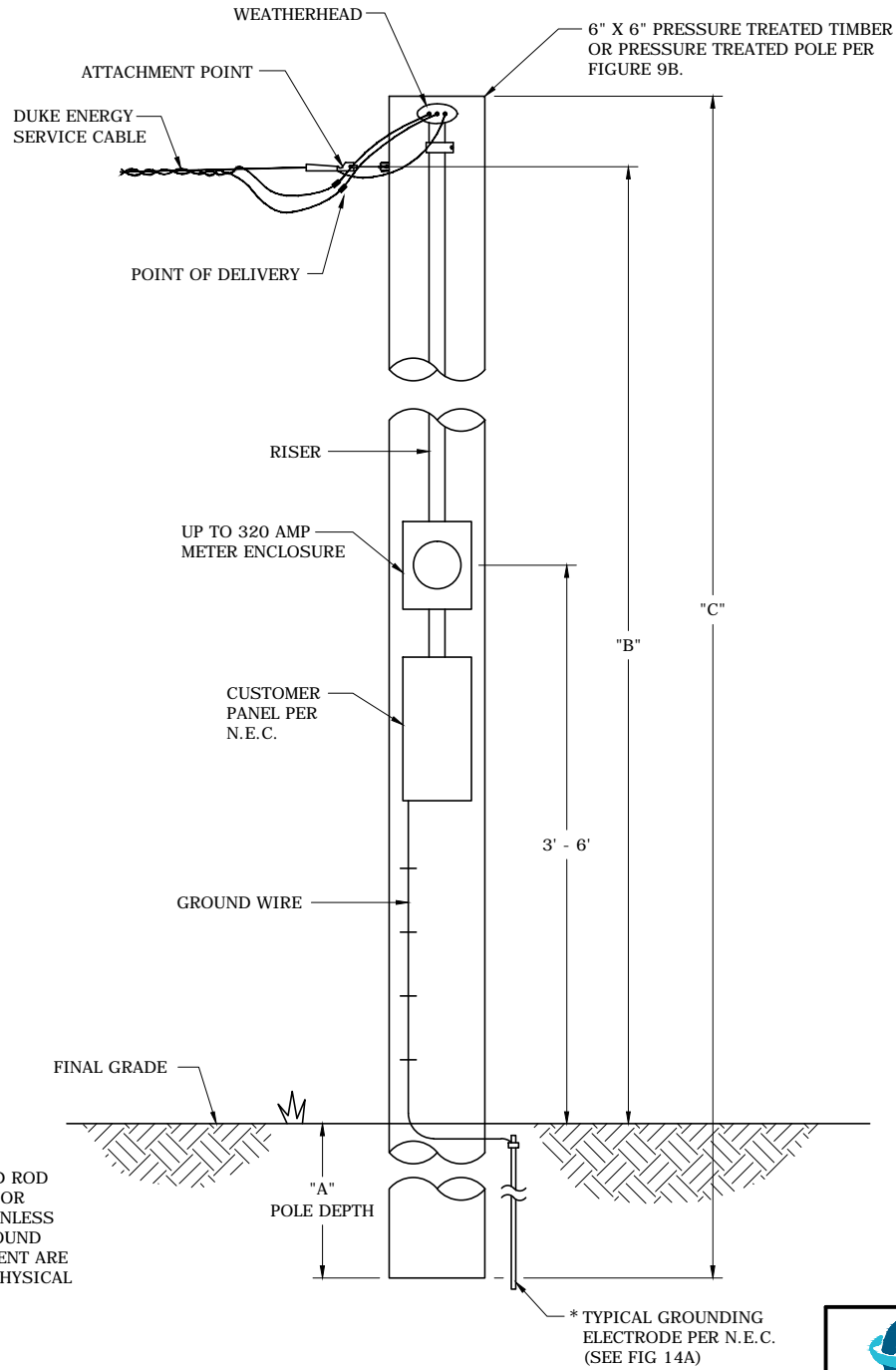


DEC	DEM	DEP	DEF
X		X	

FIG 8



PLAN VIEW



\* UPPER END OF GROUND ROD  
SHALL BE FLUSH WITH OR  
BELOW FINAL GRADE UNLESS  
THE ROD END AND GROUND  
CONDUCTOR ATTACHMENT ARE  
PROTECTED AGAINST PHYSICAL  
DAMAGE.

\* TYPICAL GROUNDING  
ELECTRODE PER N.E.C.  
(SEE FIG 14A)



3				
2				
1				
0	2/1/16	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

PERMANENT OVERHEAD SERVICE POLE

DEC	DEM	DEP	DEF
X		X	
FIG 9A			

TABLE 1 - CLEARANCES

"S" AREA FROM THE CUSTOMER'S POLE TO THE DUKE ENERGY LINE	NESC CLEARANCES	"A" MINIMUM BURIAL DEPTH IN AVERAGE OR GOOD SOIL	"A" MINIMUM BURIAL DEPTH IN AVERAGE POOR SOIL	"B" MINIMUM ATTACHMENT HEIGHT ABOVE GROUND TO DUKE ENERGY'S SERVICE CABLE	"C" MINIMUM POLE HEIGHT
SPACES OR WAYS SUBJECT TO PEDESTRIANS ONLY	12'	4'-0"	5'-0"	14'	20' C10
DRIVEWAYS, PARKING LOTS AND ALLEYS FOR THE STATES OF NORTH CAROLINA AND SOUTH CAROLINA	16'	4'-6"	5'-6"	20'	25' C9
ROADS, STREETS AND OTHER AREAS SUBJECT TO TRUCK TRAFFIC FOR STATE OF SOUTH CAROLINA	16'	4'-6"	5'-6"	20'	25' C9
ROADS, STREETS AND OTHER AREAS SUBJECT TO TRUCK TRAFFIC FOR STATE OF NORTH CAROLINA PER DOT REQUIREMENTS	18'	4'-6"	5'-6"	23'	30' C9

NOTES:

1. THE MINIMUM BURIAL DEPTH IS BASED ON WELL-TAMPED AND COMPACTED BACKFILL. AVERAGE OR GOOD SOIL IS FIRM SAND, CLAY OR GRAVEL-TYPE SOIL. POOR SOIL IS SOFT OR WET CLAY, LOOSE SANDS OR SOFT CLAYISH SILT-TYPE SOIL.
2. THE 12', 16' AND 18' CLEARANCES AND POLE HEIGHTS, SIZES AND DEPTH ARE BASED ON THE NATIONAL ELECTRICAL SAFETY CODE (NESC) AND DEPARTMENT OF TRANSPORTATION (DOT). (SEE FIGURE 11.)
3. MAXIMUM SERVICE LENGTH TO BE DETERMINED BY COMPANY REPRESENTATIVE.



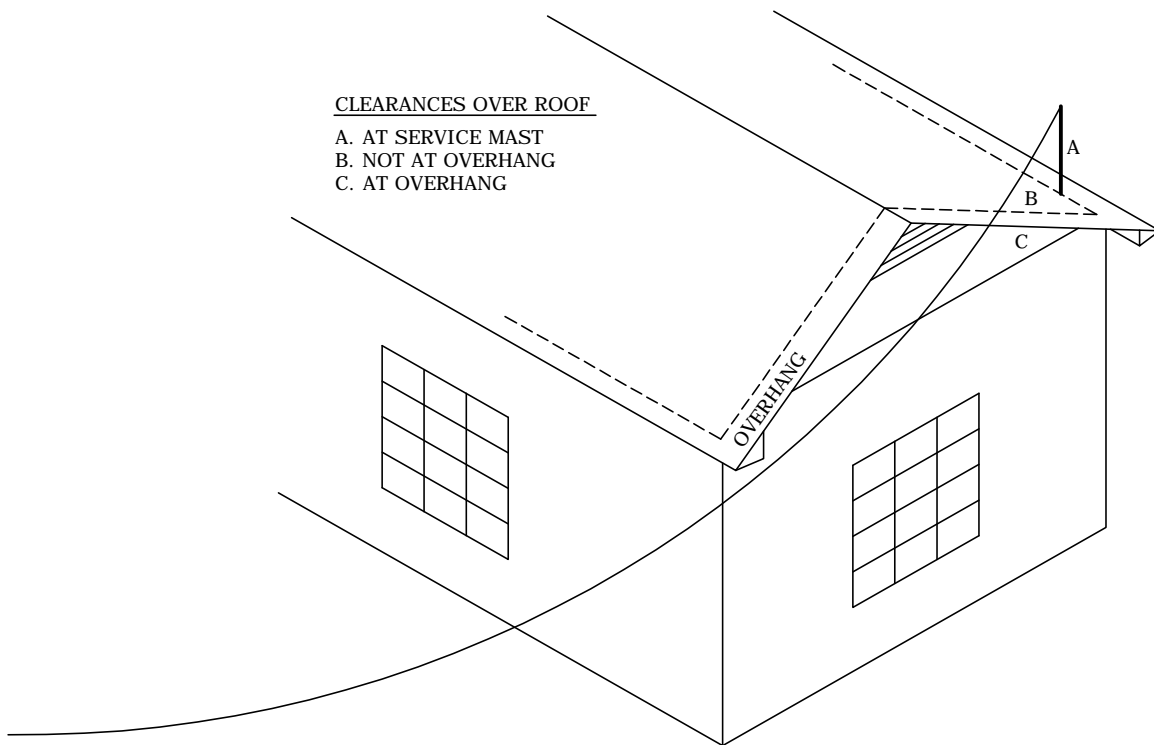
3				
2				
1				
0	10/29/15	SIMPSON	EADES	ADCOCK
REVISED	BY	CK'D	APPR.	

PERMANENT OVERHEAD SERVICE POLE

DEC	DEM	DEP	DEF
X		X	

FIG 9B





1. VERTICAL CLEARANCES OF NEW SERVICES TO BUILDINGS AT LOCATIONS A, B, AND C AS SHOWN ABOVE MUST MEET THE FOLLOWING MINIMUM CLEARANCES FOR THE HIGHEST VOLTAGE BETWEEN ANY TWO CONDUCTORS.

CLEARANCES	LOCATION	MIN. AT 60° FINAL SAG	
		0-300V	300-600V
A OR B	OVER FLAT OR READILY ACCESSIBLE ROOF	10'	10'
A OR B	OVER SLOPED ROOF WHICH IS NOT READILY ACCESSIBLE	36"	10'
C	OVER OVERHANG PORTION OF ROOF (NO MORE THAN 4' OF CABLE)	18"	10'

2. A ROOF IS CONSIDERED READILY ACCESSIBLE WHEN ACCESS IS THRU A DOORWAY, RAMP, STAIRWAY, OR PERMANENTLY MOUNTED LADDER. A SLOPED ROOF IS ONE WHERE ROOF RISES 4" OR MORE IN 12" OF HORIZONTAL DISTANCE.
3. SERVICES MUST NOT BE INSTALLED WITHOUT SPECIFICATION CLEARANCES. FOR INSTALLATIONS SIMILAR TO SKETCH, SERVICE MAST SHOULD BE TALLER AND STRONGER, OR LOCATED NEAR CORNER. IF PRACTICAL, SERVICE SHOULD BE ATTACHED ON SIDE OF BUILDING WHERE IT DOES NOT CROSS THE ROOF.
4. SERVICES SHALL ALSO HAVE 3' CLEARANCE IN ANY DIRECTION FROM WINDOWS, DOORS, PORCHES, OR SIMILAR LOCATIONS. THIS DOES NOT APPLY TO MULTIPLEX CONDUCTORS ABOVE THE TOP LEVEL OF A WINDOW OR TO WINDOWS NOT DESIGNED TO OPEN. PER N.E.S.C. RULE 234.
5. POINT OF ATTACHMENT OF SERVICE TO BUILDING SHALL BE HIGH ENOUGH TO PROVIDE THE GROUND CLEARANCES PER FIGURE 11, BUT SHALL NOT EXCEED 25' ABOVE GRADE AT TIME OF INSTALLATION AND SHALL NOT REQUIRE THE USE OF A LADDER ON CARPORT OR OTHER ROOF.

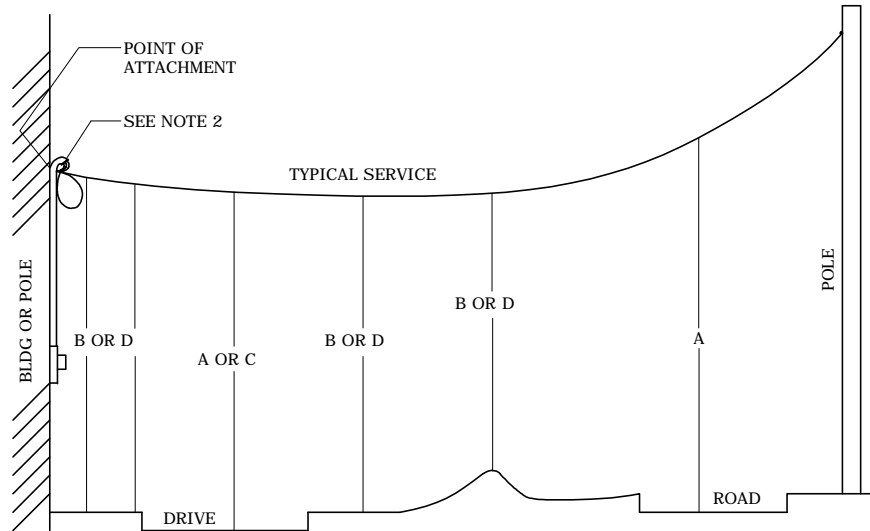


3				
2				
1				
0	10/28/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

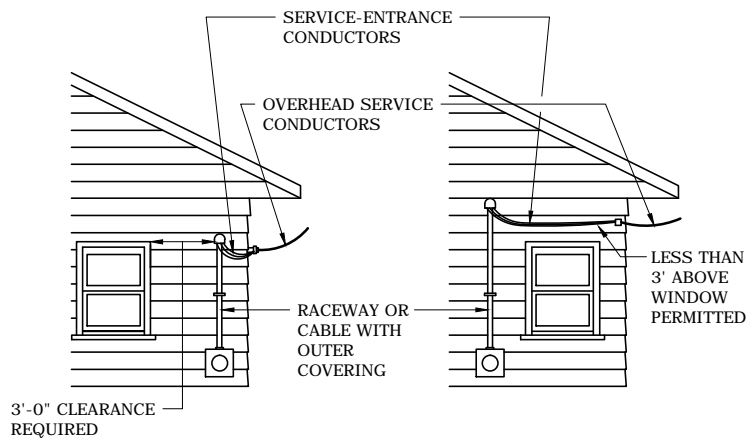
SERVICE DROP MINIMUM CLEARANCE -  
THRU-THE-ROOF SERVICE MAST

DEC	DEM	DEP	DEF
X		X	

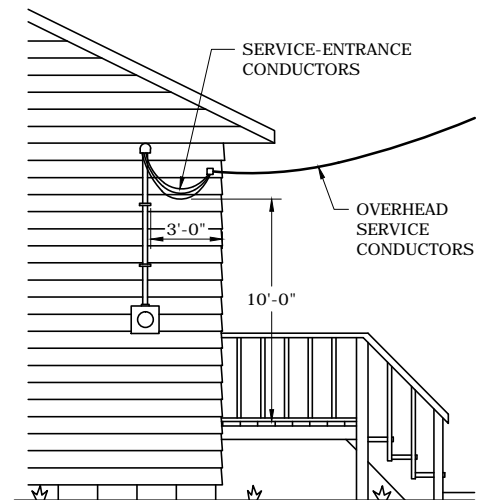
**FIG 10**



CONDITION	MINIMUM REQUIRED HEIGHT
A. OVER STREETS, ROADS, NON-RESIDENTIAL DRIVES, COMMERCIAL AREAS, AND PARKING LOTS <u>SUBJECT TO TRUCK TRAFFIC.</u>	18.0'
B. OVER OTHER LAND TRAVERSED BY VEHICLES SUCH AS FARM, GRAZING, FOREST, ETC.	18.0'
C. OVER <u>RESIDENTIAL DRIVEWAYS.</u> (SEE NOTE 4)	16.0'
D. OVER FINISHED GRADE, PLATFORMS, AND/OR OTHER SPACES IF NOT NORMALLY TRAVERSED BY VEHICLES.	12.0'



N.E.C. ARTICLE 230



NOTES:

1. THE ABOVE TABLE GIVES REQUIRED MINIMUM INSTALLATION HEIGHTS. THESE INSTALLATION HEIGHTS ARE APPLICABLE TO SERVICE DROP MULTIPLEX CABLES.
2. POINT OF ATTACHMENT OF SERVICE DROP AT BOTH BUILDING AND POLE MUST BE AT A HEIGHT SUFFICIENT TO ACHIEVE N.E.S.C. REQUIRED MINIMUM CLEARANCES.
3. SERVICE HEAD SHALL BE LOCATED ABOVE THE POINT OF ATTACHMENT OF THE SERVICE DROP CONDUCTORS TO THE STRUCTURE. EXCEPTION: WHEN THIS IS NOT PRACTICABLE, IT MAY BE LOCATED NOT OVER 24" FROM POINT OF ATTACHMENT [SEE N.E.C. ARTICLE 230.54].
4. REQUIRED GROUND CLEARANCE FOR INSULATED DRIP LOOPS IS 10 FT. FOR UP TO 150V SERVICES, AND 10.5 FT. FOR UP TO 300V SERVICES AND 16' FOR SERVICES 301-750V.
5. CUSTOMER WILL PROVIDE POINT OF ATTACHMENT.

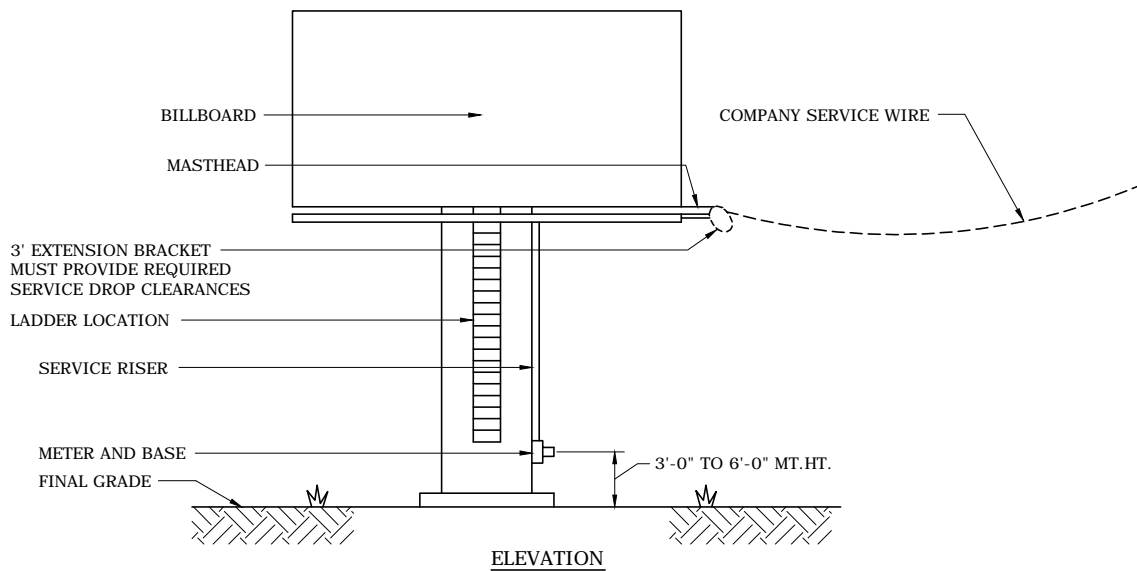
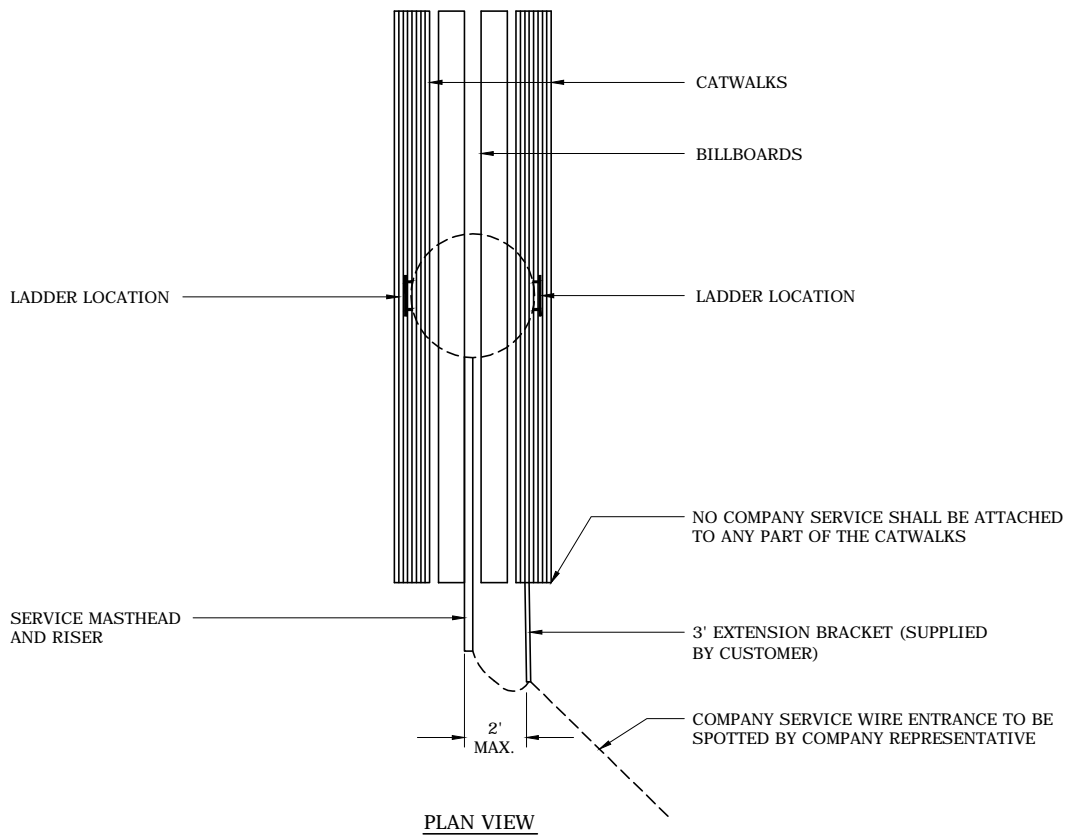


3				
2				
1				
0	10/28/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

SERVICE DROP MINIMUM CLEARANCES  
MAST ON BUILDING WALL

DEC	DEM	DEP	DEF
X		X	

FIG 11



NOTE:

1. DO NOT PROVIDE SERVICE TO SIGN WHICH DOES NOT HAVE CLEARANCES FROM ADJACENT OVERHEAD CONDUCTORS AS REQUIRED BY N.E.S.C. AND ANY ADDITIONAL COMPANY SPECIFICATIONS.

3				
2				
1				
0	10/28/15	SIMPSON	SIMPSON	CHANDLER
REVISED	BY	CK'D	APPR.	

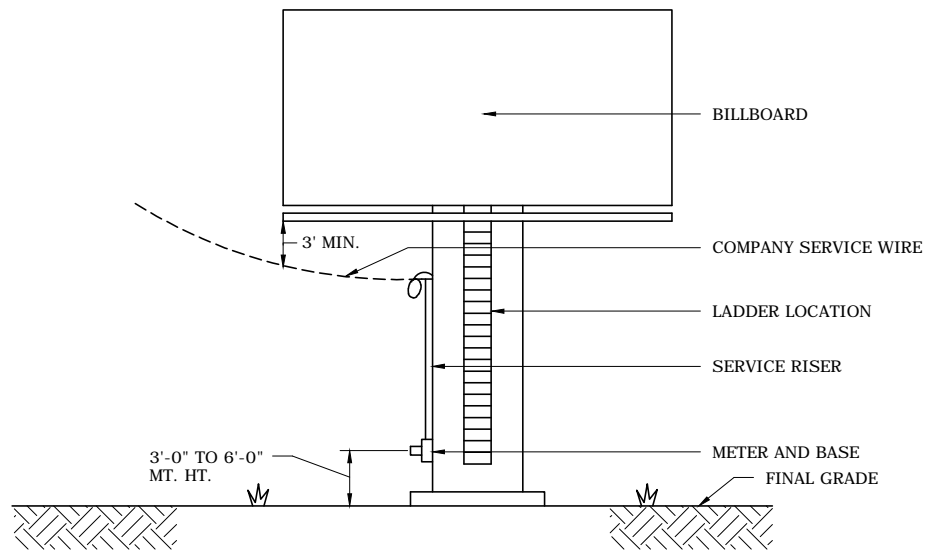
BILLBOARD SERVICE ENTRANCE REQUIREMENTS

METHOD "A"

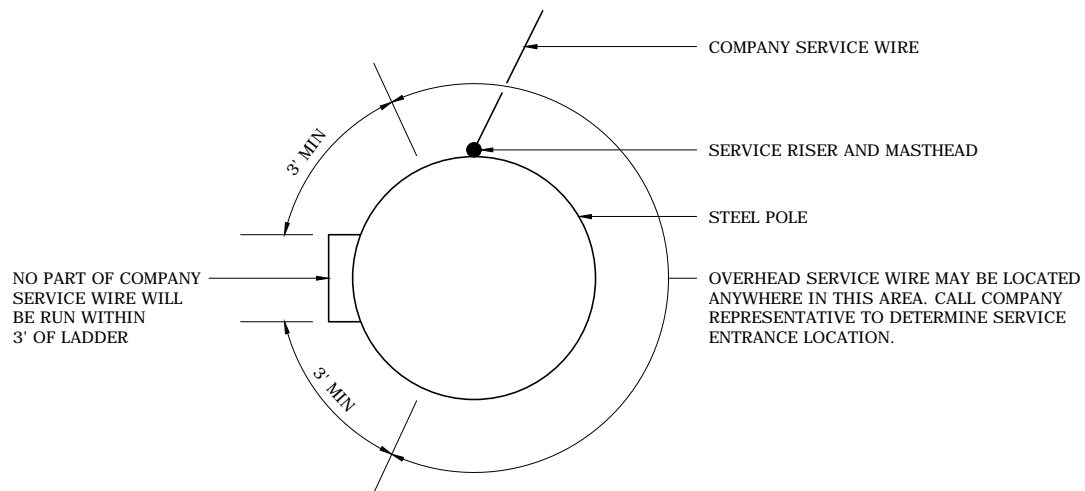


DEC	DEM	DEP	DEF
X		X	

FIG 12



ELEVATION



PLAN



3				
2				
1				
0	10/26/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

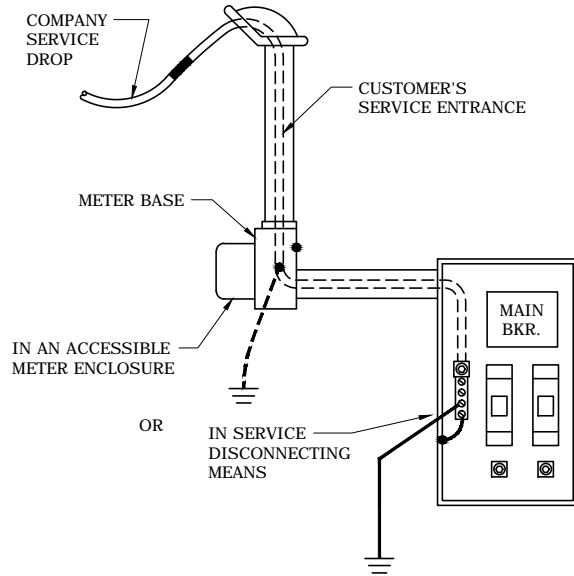
# BILLBOARD SERVICE ENTRANCE REQUIREMENTS

## METHOD "B"

DEC	DEM	DEP	DEF
X		X	

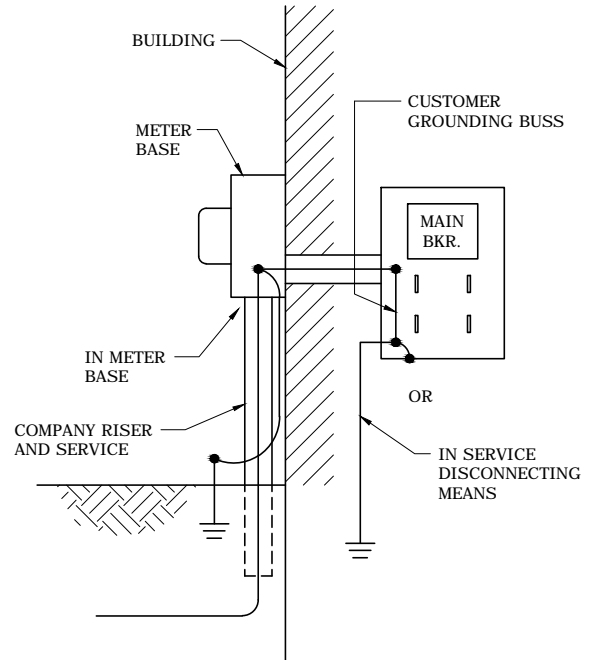
FIG 13

OVERHEAD - SELF-CONTAINED METER BASE  
OR GANG BASE



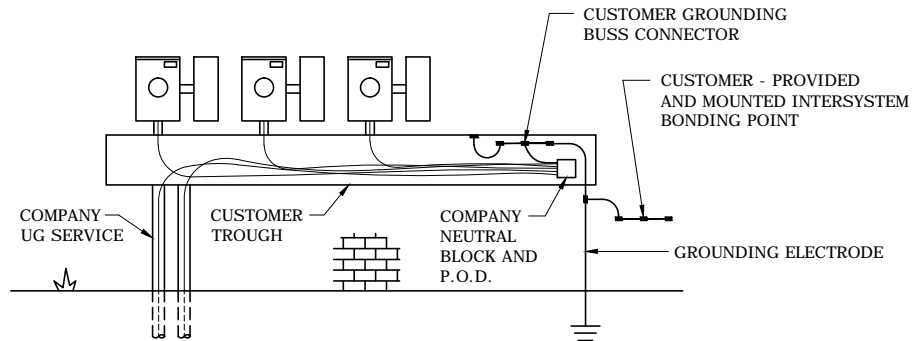
TWO OPTIONS FOR GROUNDING ELECTRODE LOCATION

UNDERGROUND - SELF-CONTAINED METER BASE  
OR GANG BASE



TWO OPTIONS FOR GROUNDING ELECTRODE LOCATION

UNDERGROUND - TROUGH



NOTES:

1. CUSTOMER TO INSTALL METER SOCKETS AS SPECIFIED BY THE COMPANY. DISCONNECTS MUST BE GROUPED PER N.E.C. ARTICLES 230.71 AND 72 AND APPROVED BY THE LOCAL AHJ.

REFERENCE: N.E.C. ARTICLE 250

NOTE: ONLY NEUTRAL CONDUCTOR SHOWN FOR CLARITY.

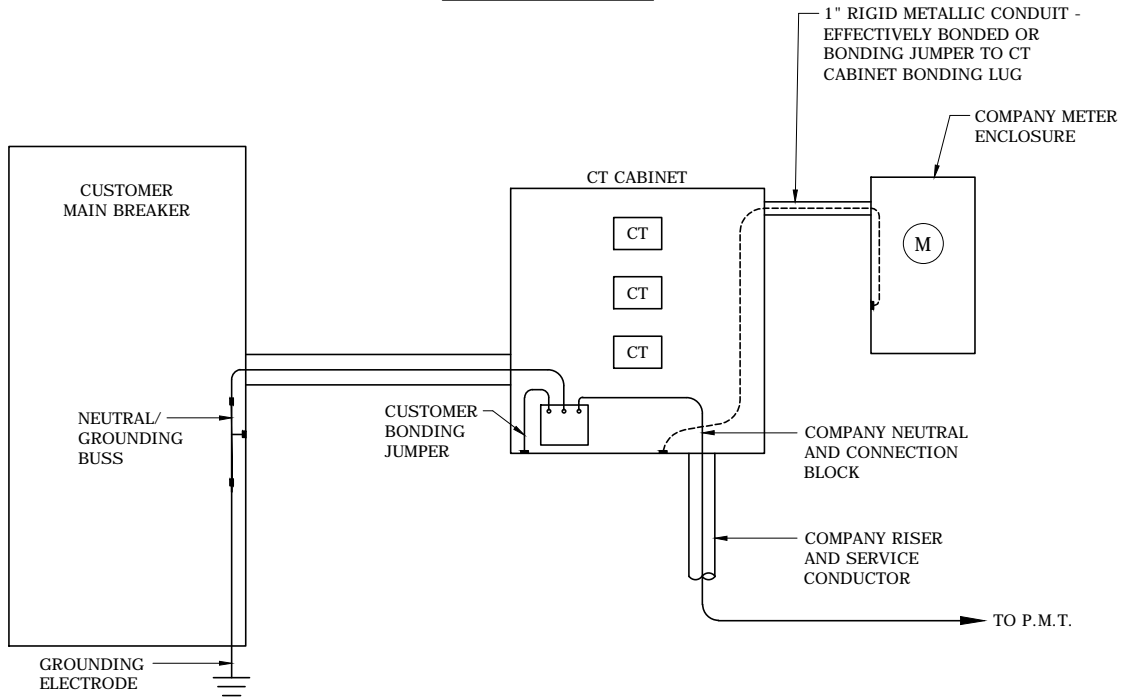


3				
2				
1				
0	1/22/16	SIMPSON	EANES	CHANDLER
REVISED	BY	CK'D	APPR.	

NATIONAL ELECTRICAL CODE (N.E.C.) ALLOWABLE  
LOCATIONS OF CONNECTIONS OF GROUNDED (NEUTRAL)  
CONDUCTOR AND GROUNDING ELECTRODE CONDUCTOR

DEC	DEM	DEP	DEF
X		X	
FIG 14A			

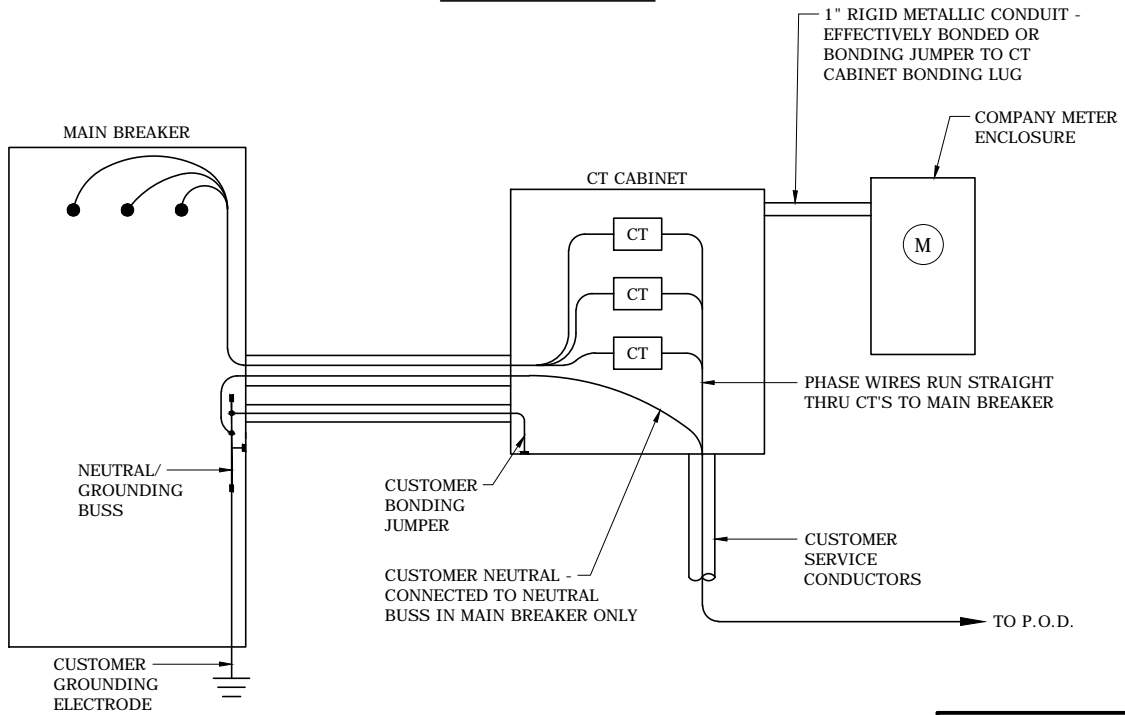
CT CABINET INSTALLATION  
PREFERRED METHOD



REFERENCE: N.E.C. ARTICLE 250

NOTE: ONLY NEUTRAL CONDUCTOR SHOWN FOR CLARITY.

CT CABINET INSTALLATION  
ALTERNATE METHOD



REFERENCE: N.E.C. ARTICLE 250



3				
2				
1				
0	10/29/15	SIMPSON	EANES	CHANDLER
REVISED	BY	CK'D	APPR.	

NATIONAL ELECTRICAL CODE (N.E.C.) ALLOWABLE  
LOCATIONS OF CONNECTIONS OF GROUNDED (NEUTRAL)  
CONDUCTOR AND GROUNDING ELECTRODE CONDUCTOR

DEC	DEM	DEP	DEF
X		X	

**FIG 14B**

DEP
METERED SERVICE VOLTAGES
SINGLE-PHASE
120V, 2-WIRE
120/208V, 3-WIRE *
120/240V, 3-WIRE
240/480V, 3WIRE *
2400V, 2-WIRE *
7200V, 2-WIRE
13200V, 2-WIRE
THREE-PHASE
208Y/120V, 4WIRE
240/120V, 4-WIRE
240V, 3-WIRE *
480V, 3-WIRE *
480Y/277V, 4-WIRE
480/240V, 4-WIRE *
600V, 3WIRE **
2400V, 3-WIRE *
4160Y/2400V, 4-WIRE
12470V, 3-WIRE *
12470Y/7200V, 4-WIRE
22860V, 3-WIRE *
22860Y/13200V, 4-WIRE

DEC
METERED SERVICE VOLTAGES
SINGLE-PHASE
120/208V, 3-WIRE *
120/240V, 3-WIRE
240/480V, 3-WIRE
7200V, 2-WIRE *
13800V, 2-WIRE *
14400V, 2-WIRE *
THREE-PHASE
208Y/120V, 4-WIRE
240V, 3-WIRE
460V, 3-WIRE
460Y/265V, 4-WIRE
480V, 3-WIRE
480Y/277V, 4-WIRE
575V, 3-WIRE
2300V, 3-WIRE
4160Y/2400V, 4-WIRE
12470Y/7200V, 4-WIRE
23900Y/13800V, 4-WIRE
24940Y/14400V, 4-WIRE

\* NON-STANDARD VOLTAGES THAT MAY BE SUPPLIED UNDER CERTAIN CIRCUMSTANCES  
 \*\* FROM OVERHEAD TRANSFORMER BANK ONLY

NOTES:

1. SEE FIGURE 59 FOR CONNECTING ALL 4-WIRE Y-CONNECTED SERVICES.
2. SEE FIGURE 60 FOR CONNECTING ALL 3-WIRE DELTA-CONNECTED SERVICES

3				
2				
1				
0	10/29/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

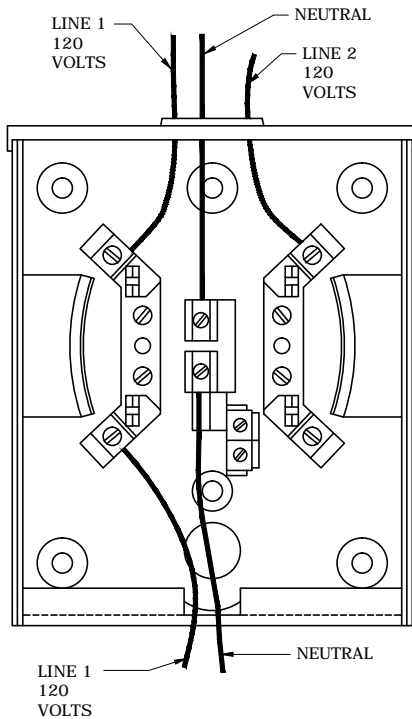
METERED SERVICE VOLTAGES



DEC	DEM	DEP	DEF
X		X	

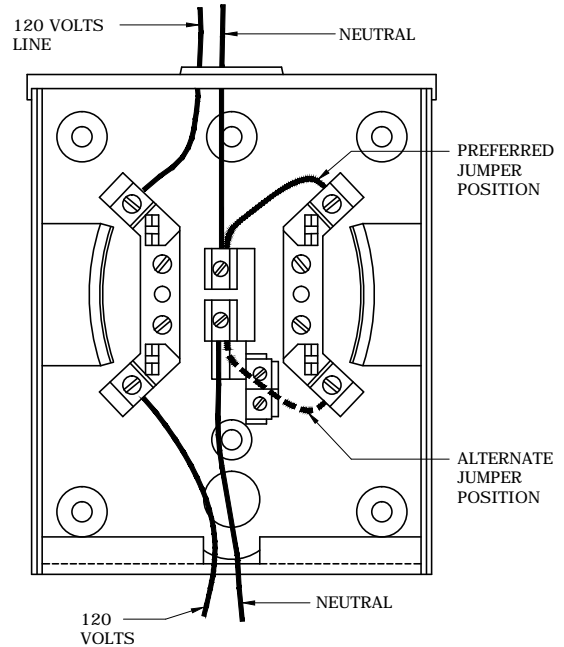
FIG 15

### 3 WIRE 120/240 VOLT SOURCE



REQUIRES FORM 2S METER  
STANDARD 240-VOLT  
"HOUSE-TYPE" METER

### 2 WIRE 120 VOLT SOURCE



REQUIRES FORM 1S METER  
STANDARD 120-VOLT METER  
(SEE NOTE 2)

#### NOTES:

1. WHERE THE CUSTOMER'S METER BASE IS NOT WIRED AS SHOWN ON THIS DRAWING, AN ELECTRICAL CONTRACTOR SHOULD REWIRE THE BASE AND THE COMPANY WILL INSTALL THE APPLICABLE METER.
2. INSTALLING A 2S METER IN A SOCKET WIRED FOR A 1S METER WILL RESULT IN APPROXIMATELY 50% METER REGISTRATION.
3. SEE FIG. 14A FOR GROUNDING DETAILS.

3				
2				
1				
0	10/28/15	SIMPSON	SIMPSON	CHANDLER
REVISED	BY	CK'D	APPR.	

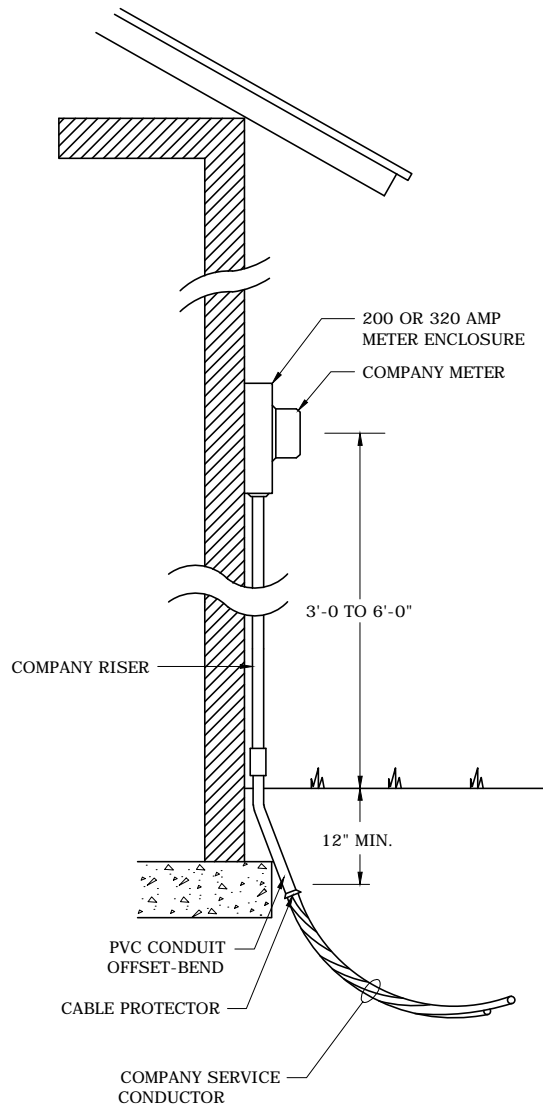
METERING, SINGLE-PHASE, 120 VOLTS, 2 WIRE



DEC	DEM	DEP	DEF
X		X	

FIG 18





**NOTES:**

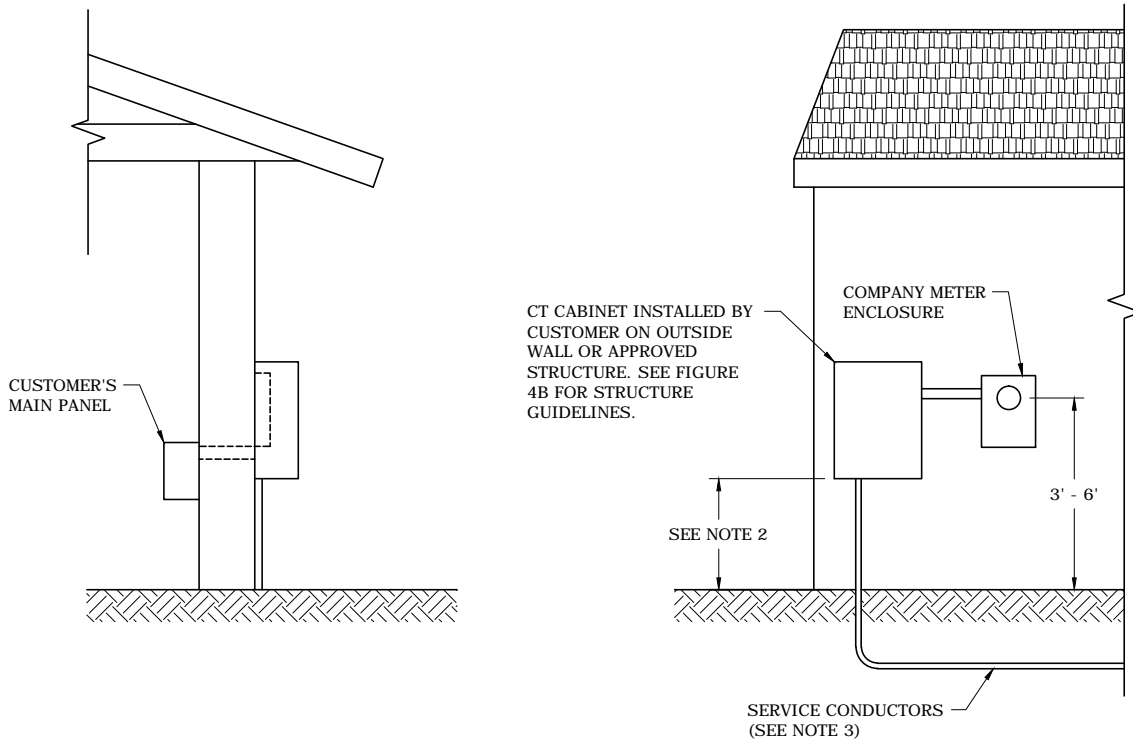
1. BOTTOM OF TRENCH MUST BE FIRMLY TAMPED NEAR BUILDING TO REDUCE SETTLING. CABLE MUST BE POSITIONED FIRMLY AGAINST BOTTOM OF TRENCH DURING BACKFILLING.
2. GROUND PER FIGURE 14A. UPPER END OF GROUND ROD SHALL BE FLUSH WITH OR BELOW FINAL GRADE, UNLESS THE ROD END AND GROUNDING CONDUCTOR ATTACHMENT ARE PROTECTED.
3. METERS MUST NOT BE LOCATED IN CARPORTS OR AREAS PLANNED FOR FUTURE EXPANSION.
4. POINT OF DELIVERY IS WHERE COMPANY RISER CONDUCTORS CONNECT TO THE LINE SIDE LUGS OF THE CUSTOMER OWNED METER BASE.



**TYPICAL UNDERGROUND SELF-CONTAINED SERVICE  
SINGLE AND THREE-PHASE**

DEC	DEM	DEP	DEF
X		X	
FIG 20			

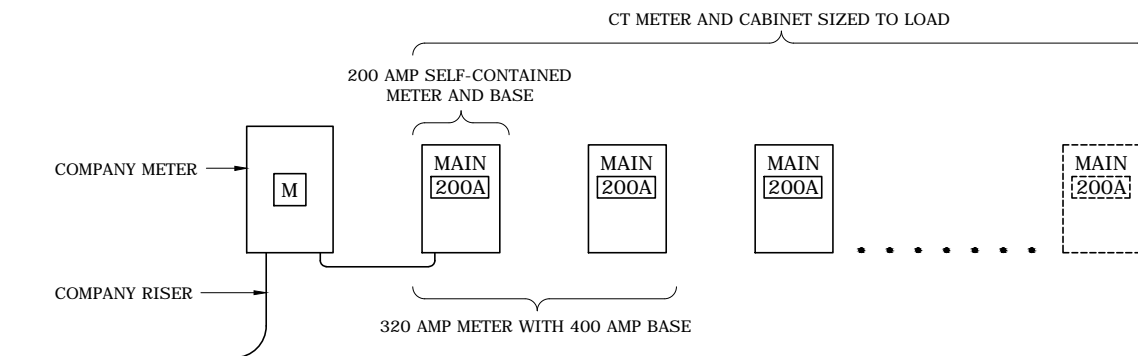
3				
2				
1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	



NOTES:

1. METER ENCLOSURE OWNED AND INSTALLED BY COMPANY.
2. CT CABINET  
DEC: OWNED AND INSTALLED BY CUSTOMER. SEE FIGURE 43A.  
DEP: OWNED BY COMPANY; INSTALLED BY CUSTOMER. SEE FIGURE 43B.
3. SERVICE CONDUCTORS WILL BE INSTALLED BY THE COMPANY OR CUSTOMER DEPENDING ON THE ESTABLISHED POINT OF DELIVERY AS SPECIFIED BY COMPANY REPRESENTATIVE.

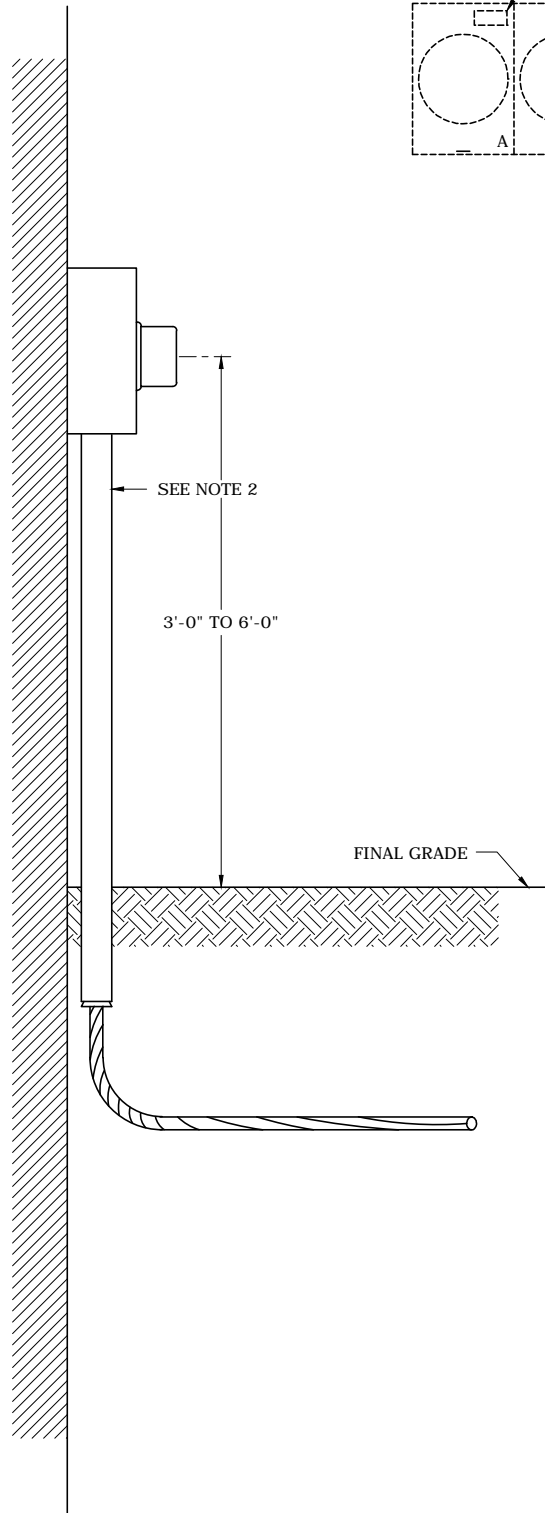
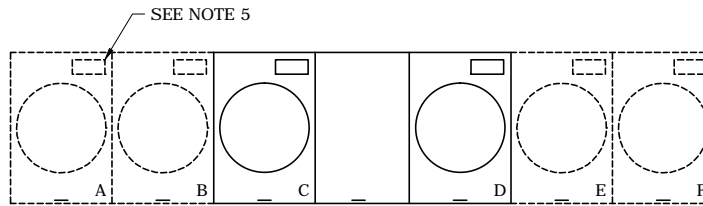
TYPICAL FIELD APPLICATION OF SELF-CONTAINED VS. CT METERING SINGLE-PHASE AND THREE-PHASE



3				
2				
1				
0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

TYPICAL CURRENT TRANSFORMER CABINET AND  
METER ENCLOSURE INSTALLATION FOR  
UNDERGROUND SERVICES  
(SINGLE-PHASE AND THREE-PHASE)

DEC	DEM	DEP	DEF
X		X	
FIG 21			



**NOTES:**

1. APPROVED GANGED METER SOCKETS TO BE FURNISHED AND OWNED BY CUSTOMER. ELECTRICAL CONTRACTOR TO INSTALL ON OUTSIDE OF BUILDING WALL AND TO BOND TO NEUTRAL.
2. COMPANY TO INSTALL SERVICE RISER.
3. POINT OF DELIVERY IS WHERE COMPANY CONDUCTORS ATTACH TO GANGED TERMINAL LUGS.
4. IF ANY OF THE INDIVIDUAL SERVICES REQUIRE A METER SOCKET GREATER THAN 200 AMP. CAPACITY, THEN A GANGED PANEL OF GREATER AMPACITY MUST BE USED.
5. LABELING OF EACH METER ENCLOSURE SHALL MEET THE REQUIREMENTS OF FIGURE 3.
6. SEE FIG. 14A FOR GROUNDING DETAILS.

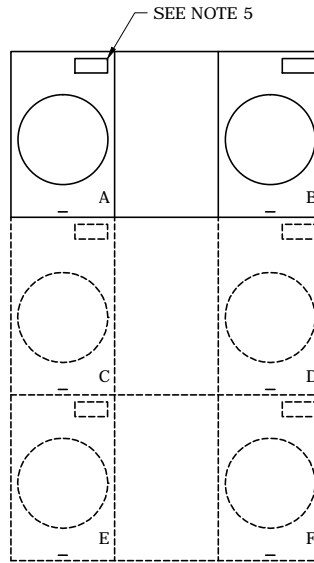
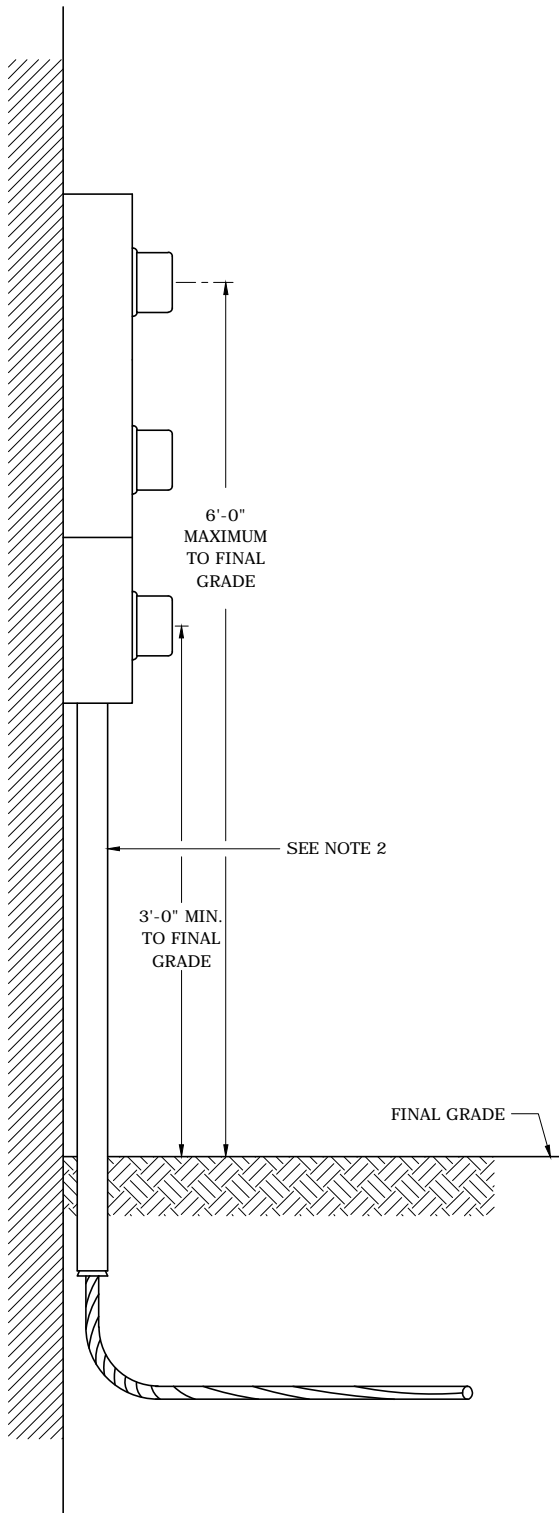
3				
2				
1				
0	1/5/15	SIMPSON	EANES	CHANDLER
REVISED	BY	CK'D	APPR.	

**HORIZONTAL GANGED METERING INSTALLATION  
(2 - 6 METERS)  
SINGLE-PHASE**



DEC	DEM	DEP	DEF
X		X	

**FIG 25**



**NOTES:**

1. APPROVED METER SOCKETS TO BE FURNISHED AND OWNED BY THE CUSTOMER. ELECTRICAL CONTRACTOR TO INSTALL ON THE THE OUTSIDE OF THE BUILDING WALL AND TO BOND TO NEUTRAL.
2. COMPANY TO INSTALL SERVICE RISER.
3. POINT OF DELIVERY IS WHERE COMPANY CONDUCTORS ATTACHED TO GANGED TERMINAL LUGS.
4. IF ANY OF THE INDIVIDUAL SERVICES REQUIRE A METER SOCKET GREATER THAN 200 AMP. CAPACITY, THEN A GANGED PANEL OF GREATER AMPACITY MUST BE USED.
5. LABELING OF EACH METER ENCLOSURE SHALL MEET THE REQUIREMENTS OF FIGURE 3.
6. SEE FIG. 14A FOR GROUNDING DETAILS.

USE THIS PANEL ONLY WHEN MOUNTING SPACE  
PROHIBITS USE OF HORIZONTAL TYPE

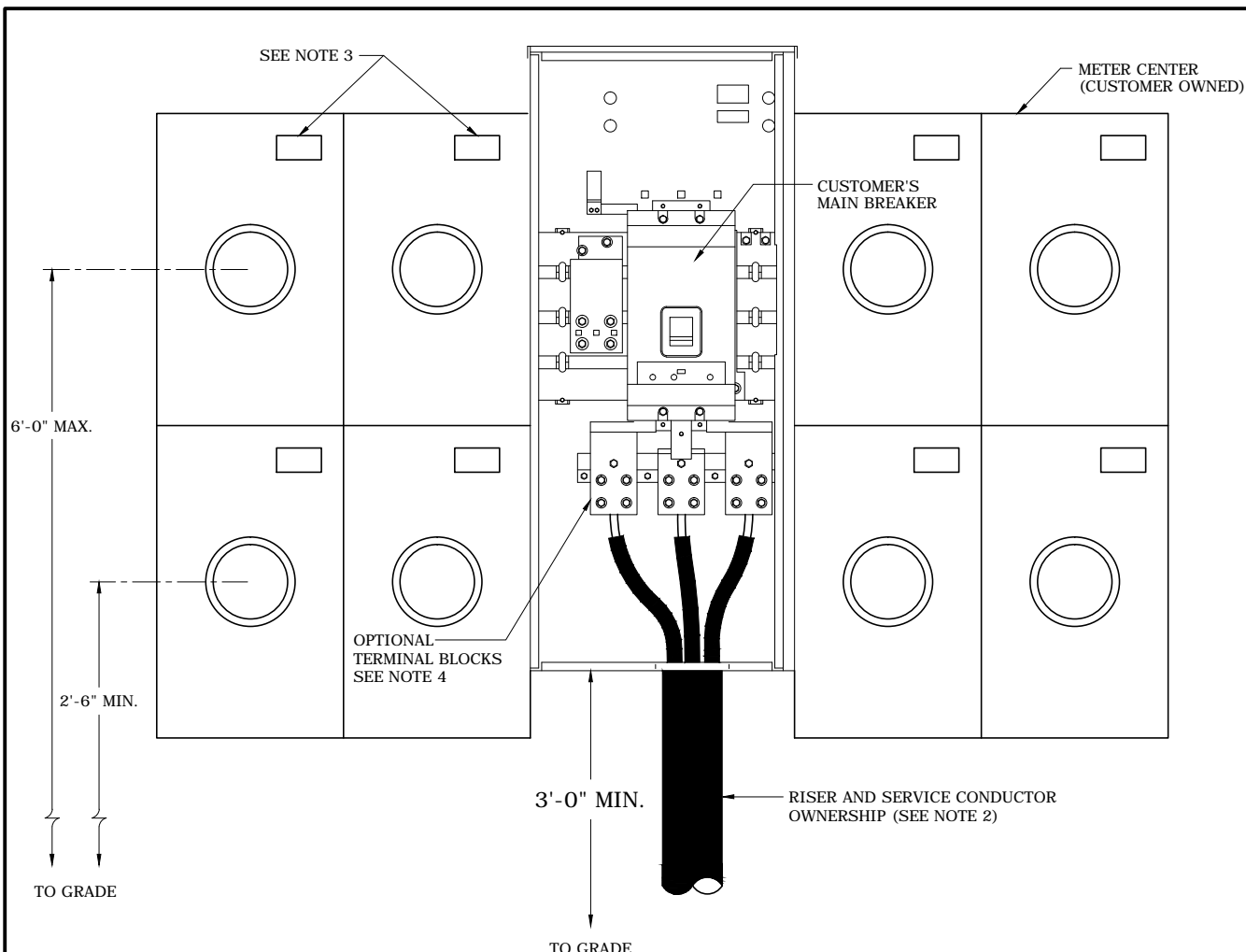
3				
2				
1				
0	1/5/16	SIMPSON	EANES	CHANDLER
REVISED	BY	CK'D	APPR.	

**VERTICAL GANGED METERING INSTALLATION**  
**(2 - 6 METERS)**  
**SINGLE-PHASE**



DEC	DEM	DEP	DEF
X		X	

**FIG 26**



#### NOTES:

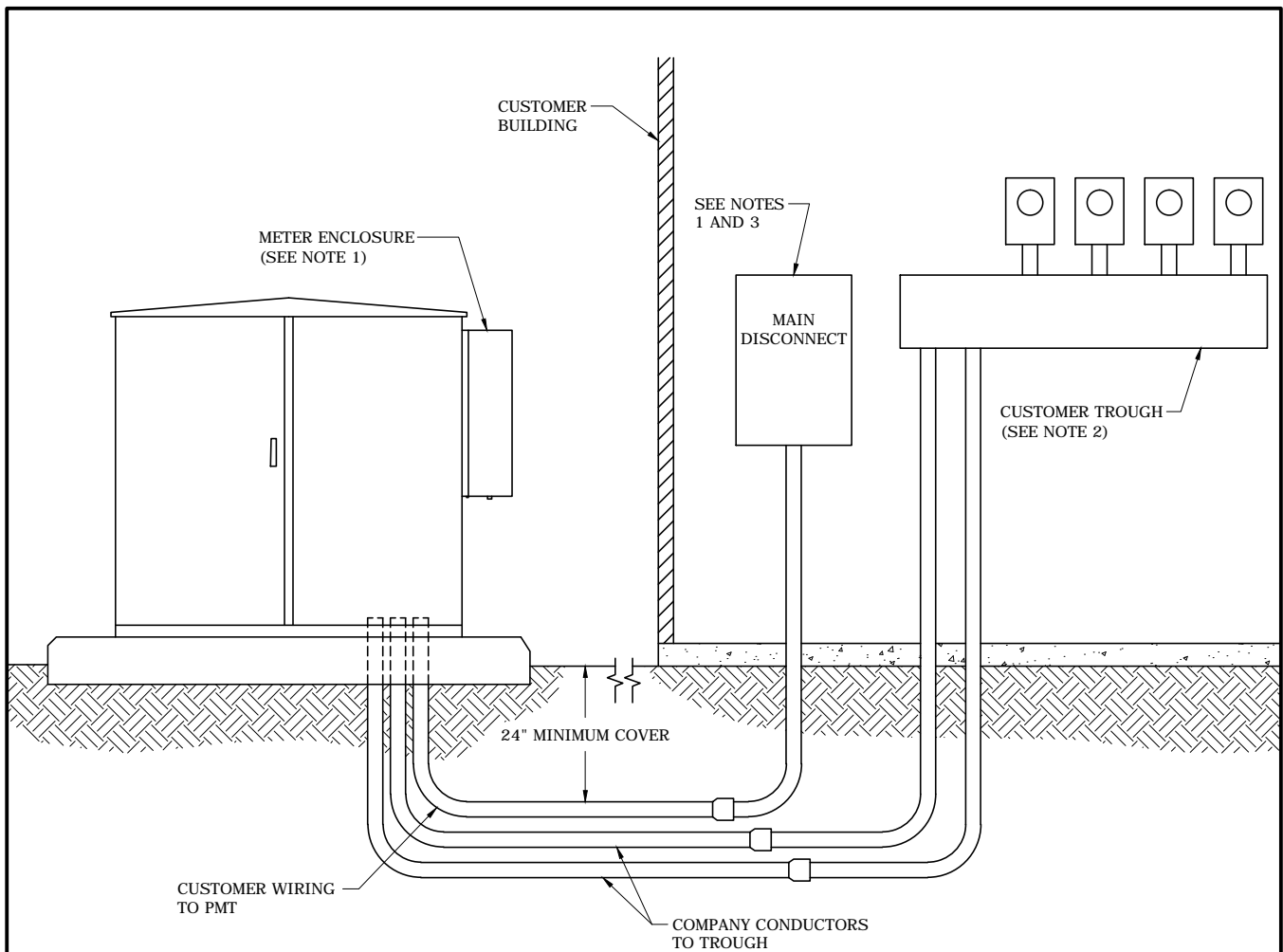
1. U.L. LISTED METER CENTER TO BE FURNISHED AND OWNED BY THE CUSTOMER. ELECTRICAL CONTRACTOR TO INSTALL ON THE OUTSIDE OF THE BUILDING WALL AND TO BOND TO NEUTRAL.
2. SERVICE RISER AND CONDUCTOR OWNERSHIP:
  - A. SINGLE-PHASE SERVICES: THE COMPANY
  - B. THREE-PHASE SERVICES: THE CUSTOMER
3. LABEL EACH SOCKET COVER AS SHOWN IN FIGURE 3.
4. POINT OF DELIVERY (P.O.D.):
  - A. SINGLE-PHASE SERVICES: POINT OF DELIVERY WILL BE WHERE COMPANY CONDUCTORS ATTACH TO MAIN DISCONNECT. IF LOCAL INSPECTION AUTHORITY OBJECTS TO COMPANY CABLES IN UL RATED TERMINALS OF MAIN BREAKER, THE CUSTOMER WILL PROVIDE THE APPROPRIATE TERMINAL BLOCKS OFF THE BREAKER TO ATTACH COMPANY CABLES. TERMINAL BLOCKS MUST BE SIZED 3/0-500 KCMIL AL OR CU MINIMUM, DOUBLE LUGGED IF NECESSARY TO ACCOMMODATE COMPANY SERVICE.
  - B. THREE-PHASE SERVICES: POINT OF DELIVERY WILL BE WHERE CUSTOMER CONDUCTORS ATTACH TO SECONDARY TERMINALS OF COMPANY TRANSFORMER.
5. SEE FIG. 14A FOR GROUNDING DETAILS.



3				
2				
1				
0	1/5/16	SIMPSON	EANES	CHANDLER
REVISED	BY	CK'D	APPR.	

### METER CENTER INSTALLATION (MAIN DISCONNECT - GREATER THAN 6 METERS) SINGLE AND THREE-PHASE

DEC	DEM	DEP	DEF
X		X	
FIG 27			



#### NOTES:

##### 1. SINGLE CUSTOMER:

METER ON TRANSFORMER: A SINGLE CUSTOMER SERVED FROM THE TRANSFORMER WILL BE METERED ON THE TRANSFORMER. CUSTOMER OWNS AND INSTALLS UNDERGROUND SERVICE. POINT OF DELIVERY IS AT SECONDARY BUSHING OF TRANSFORMER. COMPANY ENGINEER SHALL APPROVE THE NUMBER AND SIZE OF CUSTOMER'S SERVICE CONDUITS AND CABLES (SEE FIGURE 58).

##### 2. MULTIPLE CUSTOMERS:

METER ON OUTSIDE WALL: COMPANY OWNS AND INSTALLS UNDERGROUND SERVICE. POINT OF DELIVERY IS WHERE COMPANY'S CONDUCTORS CONNECT TO CUSTOMER'S CONDUCTORS IN CUSTOMER PROVIDED TROUGH (SEE FIGURES 47A AND 47B).

##### 3. EXISTING CT METER ON PMT: ADDING ADDITIONAL CUSTOMERS (MULTI-TENANT METERING):

ONE SERVICE IS C.T. METERED ON THE PAD-MOUNTED TRANSFORMER AND OTHER CUSTOMER OWNED SERVICES ARE RUN TO THE SAME TRANSFORMER BUT ARE METERED ELSEWHERE (BUILDING WALL OR METER ROOM). BOTH ENDS OF ALL CUSTOMER CABLES MUST BE CLEARLY AND SPECIFICALLY MARKED FOR PHASE AND LABELED WITH A TAG TO IDENTIFY THE LOCATION OF THE SOURCE AND LOAD ENDS OF THE CONDUCTOR. THE LOAD END OF EACH CABLE SHALL BE LABELED TO IDENTIFY THE SOURCE. EACH SOURCE END SHALL BE LABELED TO IDENTIFY THE LOCATION OF THE LOAD END OF THE CABLE (TROUGH NUMBER, SWITCH PANEL NUMBER, ETC.). SEE FIGURE 3 FOR METER ENCLOSURE LABELING AND CUSTOMER CONDUCTOR MARKING AND LABELING. SEE FIGURES 47A AND 47B FOR TROUGH WIRING DETAIL.

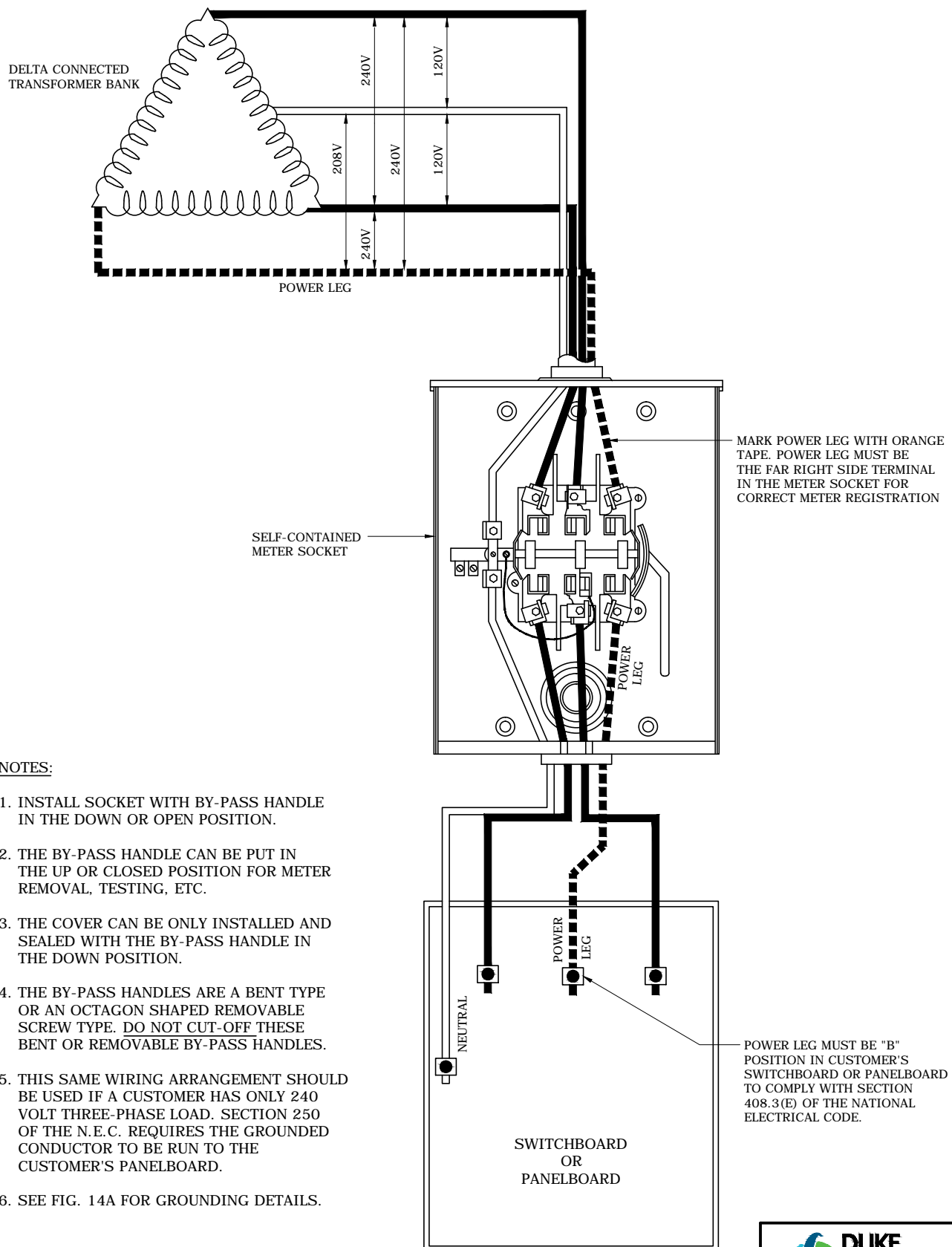
##### 4. EACH CONDUIT SHALL CONTAIN ONE SET OF SERVICE ENTRANCE CONDUCTORS: THREE-PHASE CONDUCTORS AND ONE NEUTRAL CONDUCTOR (IF APPLICABLE).



3				
2				
1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

### TYPICAL UNDERGROUND THREE-PHASE SERVICE ARRANGEMENTS NON-RESIDENTIAL

DEC	DEM	DEP	DEF
X		X	
FIG 28			



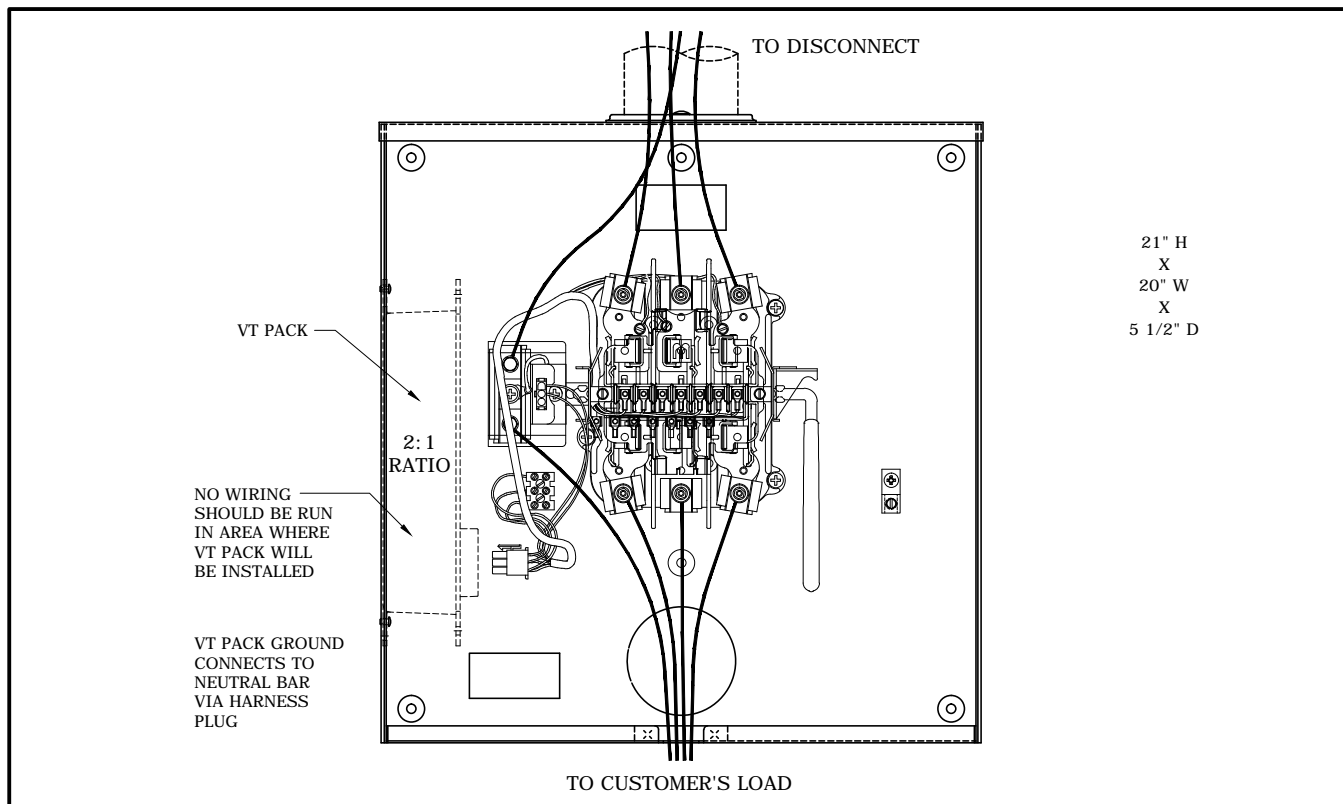
3				
2				
1				
0	10/28/15	SIMPSON	EANES	CHANDLER
REVISED	BY	CK'D	APPR.	

240/120 VOLT THREE-PHASE 4 WIRE  
SELF-CONTAINED DELTA METERING



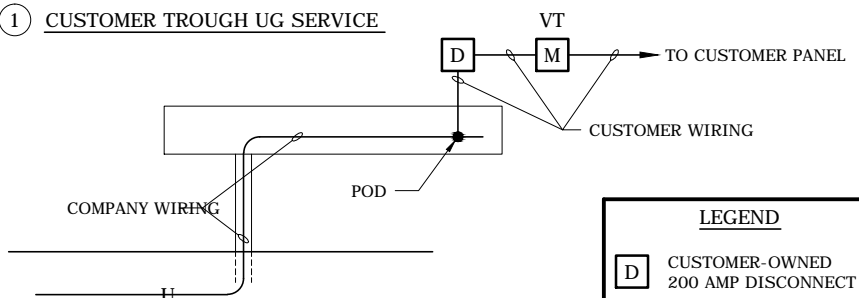
DEC	DEM	DEP	DEF
X		X	

FIG 32

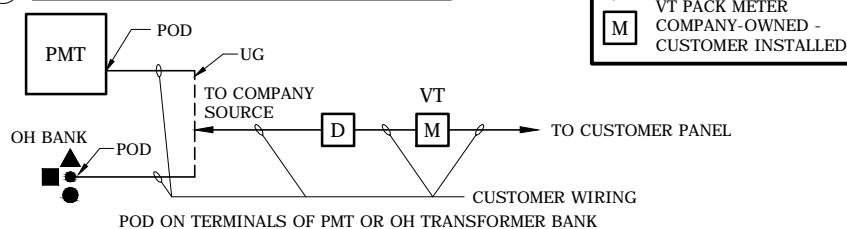


#### MODES OF SERVICE 480Y/277V 4-WIRE VT PACK (SELF-CONTAINED)

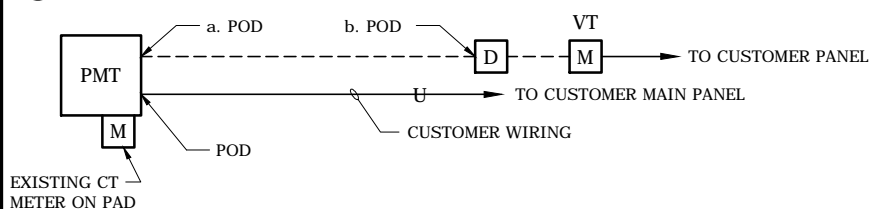
##### ① CUSTOMER TROUGH UG SERVICE



##### ② SINGLE CUSTOMER - OH OR UG SERVICE



##### ③ EXISTING CT METER ON PMT - ADDING SECOND METER



a. PREFERRED: CUSTOMER-OWNED WIRING FROM PANEL TO PMT

b. ALTERNATE: COMPANY-OWNED SERVICE TO D; CUSTOMER WIRING FROM D TO CUST. PANEL.

#### NOTES:

1. MEASURE CUSTOMER VOLTAGE ON CABLE LUGS, NOT METER SOCKET TERMINALS.
2. METER HAS A YELLOW NAMEPLATE TO INDICATE CLASS 200, FORM 9S.
3. METER MUST BE INSTALLED ON THE LOAD SIDE OF A LINE-OF-SIGHT 200 AMP DISCONNECT CAPABLE OF BEING LOCKED IN THE OFF POSITION AND PROVIDE A VISIBLE OPEN. IF THE CUSTOMER DOES NOT PLAN ON PROVIDING A DISCONNECT, THE STANDARD CT CABINET WILL BE USED FOR METERING.
4. BASE AND VT PACK ISSUED BY METERING PERSONNEL. METER BASE HAS A UL LISTING.
5. COMPANY WILL OWN AND MAINTAIN THE METER CABINET. IF A CABINET NEEDS TO BE REPLACED, COMPANY WILL FURNISH THE NEW CABINET AND UTILIZE AN ELECTRICAL CONTRACTOR TO REPLACE THE CABINET.
6. SEE FIGURE 41 FOR APPLICATION, INSTALLATION, AND OPERATIONS & MANAGEMENT NOTES.
7. ALL WIRING IS CUSTOMER OWNED.
8. SEE FIG. 14A FOR GROUNDING DETAILS.



DEC	DEM	DEP	DEF
		X	

FIG 40

480Y/277 VOLT METERING  
VT PACK FOR SERVICES  
UP TO 200 AMPS

3				
2				
1				
0	9/10/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	



DESCRIPTION:

480Y/277-VOLT, 3-PHASE, 4-WIRE SERVICES MAY NOW BE METERED USING A CLASS 200 METER AND CABINET SUPPLIED BY COMPANY. THE CUSTOMER WILL SUPPLY AND INSTALL A DISCONNECT SWITCH AHEAD OF THE METER. A CABINET WITH A 200 AMP, FORM 9S SOCKET AND LEVER BYPASS WILL BE SUPPLIED BY COMPANY AND INSTALLED BY THE CUSTOMER. COMPANY WILL INSTALL A VT PACK AND A CLASS 200 TRANSFORMER RATED METER.

APPLICATION:

1. THIS IS AN OPTIONAL METERING SYSTEM THAT IS BEST SUITED FOR 480Y/277-VOLT METERING IN SHOPPING MALLS WHERE DISCONNECTS ARE ALREADY REQUIRED AND WHERE SPACE IS A PREMIUM. EACH VT PACK MUST HAVE AN INDIVIDUAL DISCONNECT.
2. IN ADDITION, THIS METERING SYSTEM MAY BE USED FOR OTHER APPLICATIONS IF ALL REQUIREMENTS ARE MET.
3. THIS PRODUCT IS ONLY APPROVED FOR THREE-PHASE, FOUR-WIRE, 480Y/277-VOLT SERVICES AND FOR A MAXIMUM 200 AMPERE SERVICE.
4. THIS PRODUCT MAY NOT BE USED ON 3-PHASE, 3-WIRE, 480-VOLT DELTA OR FLOATING-WYE SERVICES.
5. THE CUSTOMER MUST PROVIDE A DISCONNECT ON THE SOURCE SIDE OF THE METER THAT CAN BE LOCKED IN THE OFF POSITION.

NOTE: IF THE CUSTOMER DOES NOT PLAN ON PROVIDING A DISCONNECT, THE STANDARD CT CABINET WILL BE USED FOR METERING.

6. THE DISCONNECT MUST BE IN LINE-OF-SIGHT OF THE METER AS IT WILL BE USED TO DE-ENERGIZE THE METER FOR EXCHANGES, DISCONNECTS, ETC.
7. NOTIFY THE METER TECHNICIAN WHEN CABINETS ARE REQUIRED FOR A PROJECT - THERE IS A 16 WEEK LEAD-TIME FOR LARGE ORDERS.

INSTALLATION:

1. WHEN MANY CABINETS ARE TO BE INSTALLED AT ONE LOCATION, THE CUSTOMER MUST PROVIDE A SINGLE POINT OF CONTACT TO COORDINATE THE INSTALLATION.
2. THE CUSTOMER IS RESPONSIBLE FOR INSTALLING THE CABINET PROVIDED BY COMPANY.
3. COMPANY WILL PROVIDE THE CABINETS WITHOUT THE VT-PACKS TO THE CUSTOMER'S ELECTRICIANS FOR INITIAL INSTALLATION.
4. COMPANY'S METER TECHNICIANS WILL INSTALL THE VT-PACKS AND THE METER.

OPERATIONS & MANAGEMENT:

1. THE SOURCE-SIDE DISCONNECT MUST BE OPENED BEFORE PERFORMING ANY WORK IN THE METER CABINET.
2. COMPANY WILL OWN AND MAINTAIN THE METER CABINET. IF A CABINET NEEDS TO BE REPLACED, COMPANY WILL FURNISH THE NEW CABINET AND UTILIZE AN ELECTRICAL CONTRACTOR TO REPLACE THE CABINET.

NOTES:

1. SEE FIGURE 40 FOR METER CABINET AND ONE LINE INSTALLATION DIAGRAM.

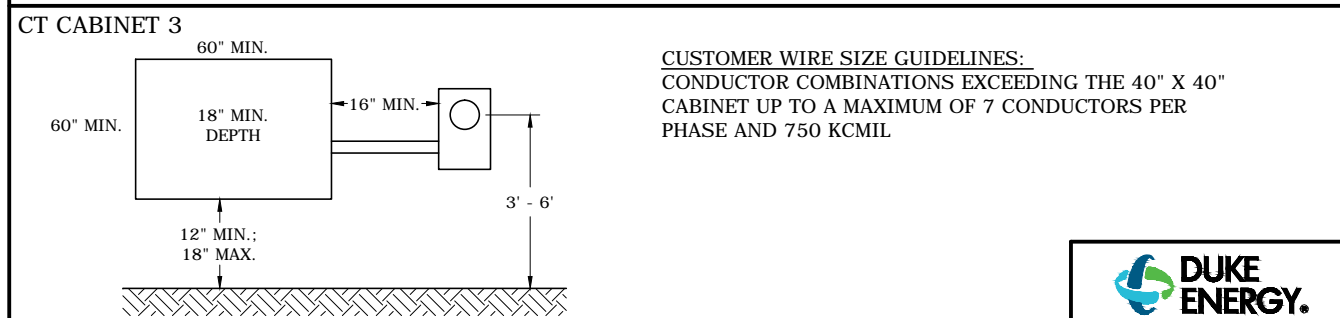
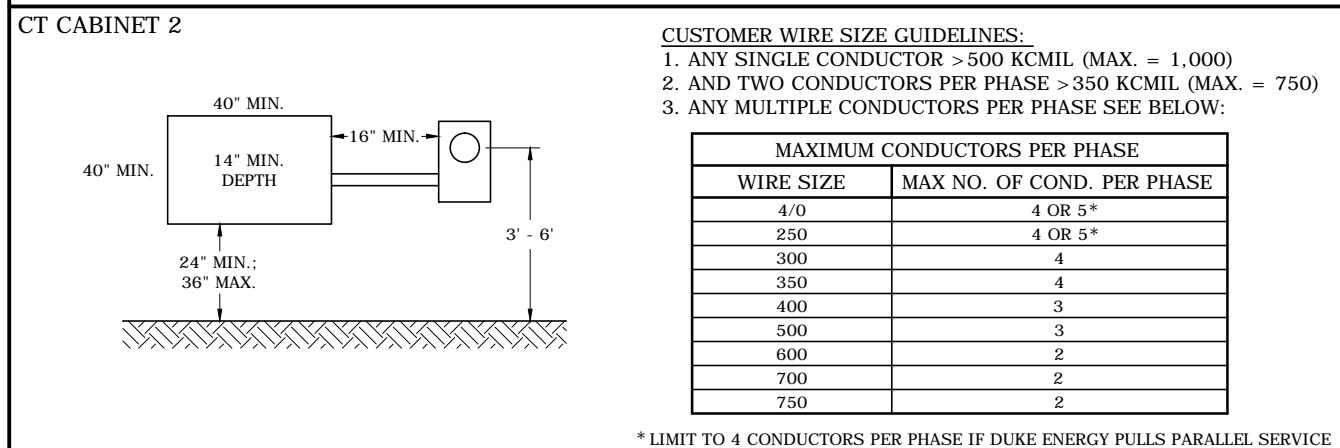
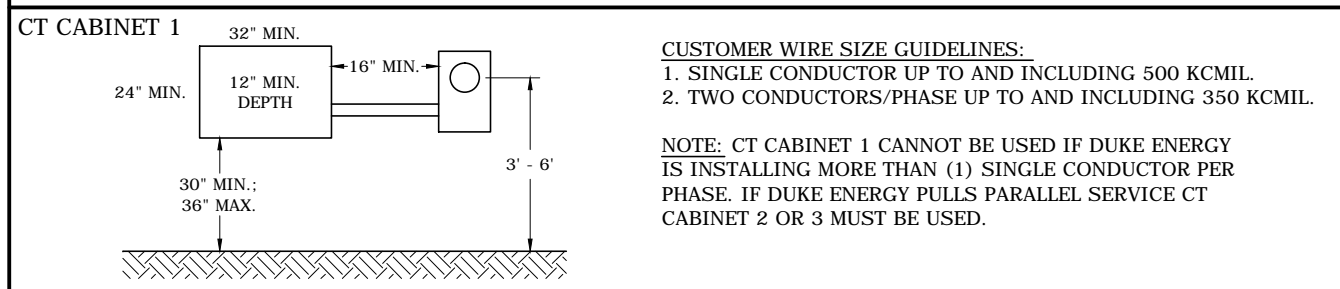
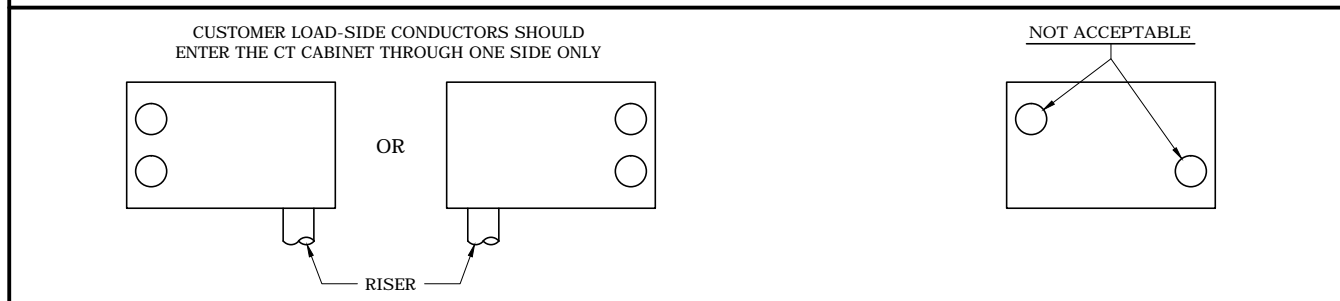
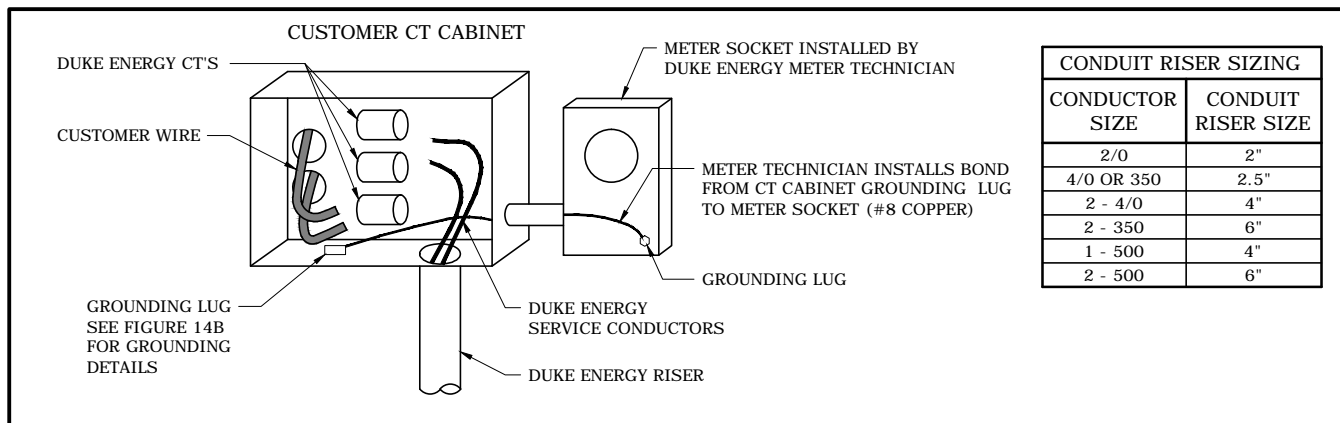
3				
2				
1				
0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

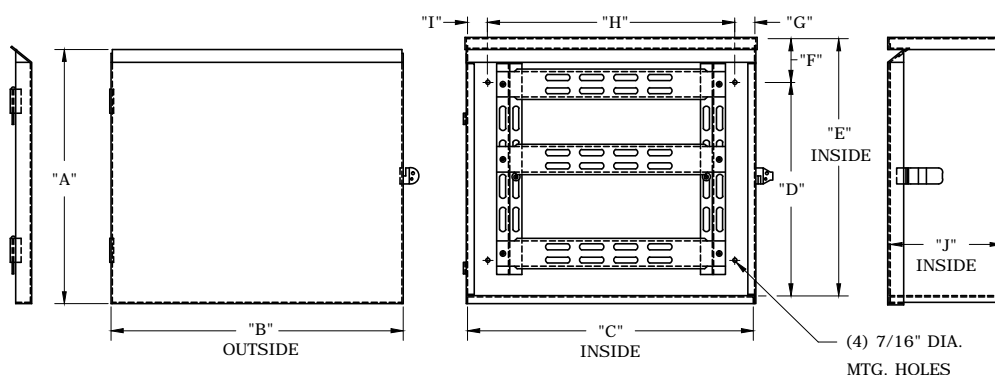
480Y/277 VOLT METERING  
VT PACK FOR SERVICES  
UP TO 200 AMPS



DEC	DEM	DEP	DEF
		X	

FIG 41





ENCLOSURE TYPE	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION E	DIMENSION F	DIMENSION G	DIMENSION H	DIMENSION I	DIMENSION J
T3	31-5/8"	32-11/32"	32"	27"	32"	2-1/2"	1-1/2"	29"	1-1/2"	10"
T4	31-5/8"	36-11/32"	36"	27"	32"	2-1/2"	1-1/2"	33"	1-1/2"	14"
T-CS1	42"	48"								16"

C.T. CABINET TYPE	1Ø METER BASE	3Ø METER BASE	SERVICE TYPE	CUSTOMER AND COMPANY		ORDER FROM	REMARKS
				MAXIMUM NUMBER OF WIRES	MAXIMUM NUMBER OF CONDUITS (4" OR SMALLER)		
T3 (LARGE) CN 14413108 (ALUMINUM) CN 14413116 (STEEL)	PRE-WIRED SOCKET *	PREWIRED SOCKET *	3Ø 240/120 V 208/120 V 480/277 V 480 V	16	4	GENERAL WAREHOUSE	COMPANY OWNED AND SUPPLIED
T4 (EXTRA-LARGE) CN 14413207 (ALUMINUM) CN 14413215 (STEEL)	PRE-WIRED SOCKET *	PREWIRED SOCKET *	3Ø 240/120 V 208/120 V 480/277 V 480 V	20	5	GENERAL WAREHOUSE	COMPANY OWNED AND SUPPLIED
T-CS1 (CUSTOMER SUPPLIED) SEE NOTES 3 & 4	PRE-WIRED SOCKET *	PREWIRED SOCKET *	3Ø 240/120 V 208/120 V 480/277 V 480 V	32	8	CUSTOMER'S ELECTRICIAN	CUSTOMER OWNED AND SUPPLIED

\* BASE PROVIDED BY COMPANY

#### NOTES:

- PARALLEL CONDUCTORS WILL BE CUT TO FIT IN CABINET.
- A C.T. CABINET SHALL NOT BE USED AS A JUNCTION BOX TO SERVE MULTIPLE ACCOUNTS.
- WHEN THE TOTAL NUMBER OF WIRES (CUSTOMER AND COMPANY) EXCEEDS 20, THE CUSTOMER SHALL AT HIS EXPENSE, PROVIDE AND INSTALL A FABRICATED CABINET OF SUITABLE SIZE, MATERIAL, AND CONSTRUCTION AS SPECIFIED BY COMPANY REPRESENTATIVE. THE CABINET SHALL HAVE A HINGED COVER WHICH IS SEALABLE AND INCLUDE PROVISIONS FOR MOUNTING INSTRUMENT TRANSFORMERS (AS SHOWN ABOVE) OR 3/4" WOODEN BACKBOARD THE PREFERRED CABINET SIZES ARE SHOWN ABOVE.
- MAXIMUM CUSTOMER EQUIPMENT IN C.T. CABINET:

CONDUITS: 6-4" MAX.

CONDUCTORS: 6 PER PHASE, 600MCM AL/CU MAX.



3				
2				
1				
0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

## INSTRUMENT TRANSFORMER METERING ENCLOSURE SELECTION DETAILS

DEC	DEM	DEP	DEF
		X	

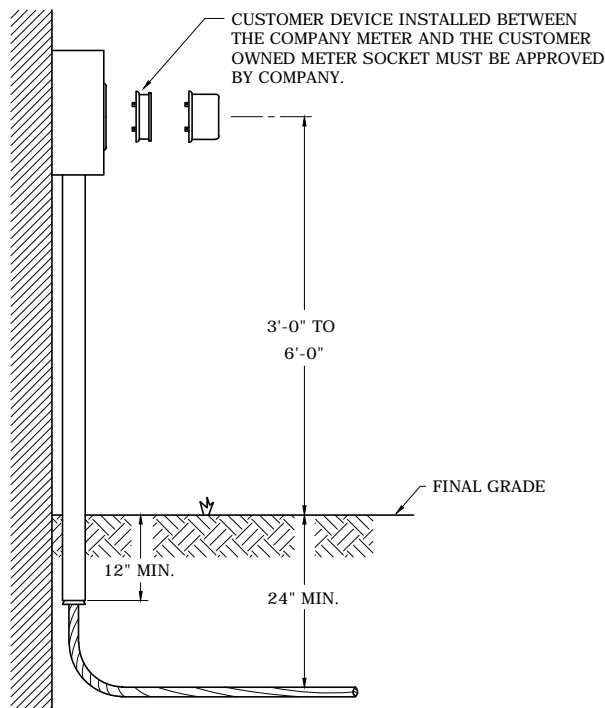
FIG 43B

#### ALL DEVICES

1. ANY DEVICE REQUESTED TO BE INSTALLED BETWEEN THE METER AND METER SOCKET MUST BE PRE APPROVED BY COMPANY METER STANDARDS ENGINEER.
2. COMPANY WILL ONLY APPROVE DEVICES WHICH WILL NOT ADVERSELY:
  - (A.) IMPACT THE ACCURACY OF COMPANY'S METER
  - (B.) IMPACT COMPANY'S ABILITY TO READ THE METER.
  - (C.) AFFECT SERVICE TO, OR USE OF SERVICE BY, THE CUSTOMER OR OTHER CUSTOMERS.
3. ANY PARTY DESIRING TO INSTALL A DEVICE BETWEEN THE METER AND THE METER SOCKET MUST OBTAIN A PERMIT OR MAKE OTHER SUITABLE ARRANGEMENTS WITH THE AHJ PRIOR TO INSTALLING SUCH DEVICES. IF OTHER SUITABLE ARRANGEMENTS ARE MADE, A COPY OF THE ARRANGEMENT MUST BE ON FILE WITH COMPANY.
4. ALL INSTALLERS OF DEVICES BETWEEN THE METER AND THE METER SOCKET MUST SCHEDULE THEIR INSTALLATION WITH COMPANY TO MINIMIZE INTERRUPTION OF SERVICE TO THE CUSTOMER. FUNCTIONS THAT MUST BE SCHEDULED ARE:
  - (A.) METER REMOVAL
  - (B.) ELECTRICAL INSPECTION AFTER THE DEVICE IS INSTALLED (IF REQUIRED).
  - (C.) REINSTALLATION OF THE METER.
5. PRIOR TO INSTALLING THE DEVICE, THE INSTALLER MUST INSPECT THE METER SOCKET, CHECK THE GROUNDING CONDUCTOR AND GROUND TO ENSURE THE INSTALLATION IS IN CODE COMPLIANCE.

#### REINSTALLATION OF THE METER

1. ENSURE INSPECTION REQUIREMENTS HAVE BEEN COMPLETED.
2. CHECK FOR GROUNDING CONTINUITY THROUGH THE DEVICE TO ENSURE THE METER WILL BE GROUNDED WHEN IT IS INSTALLED.

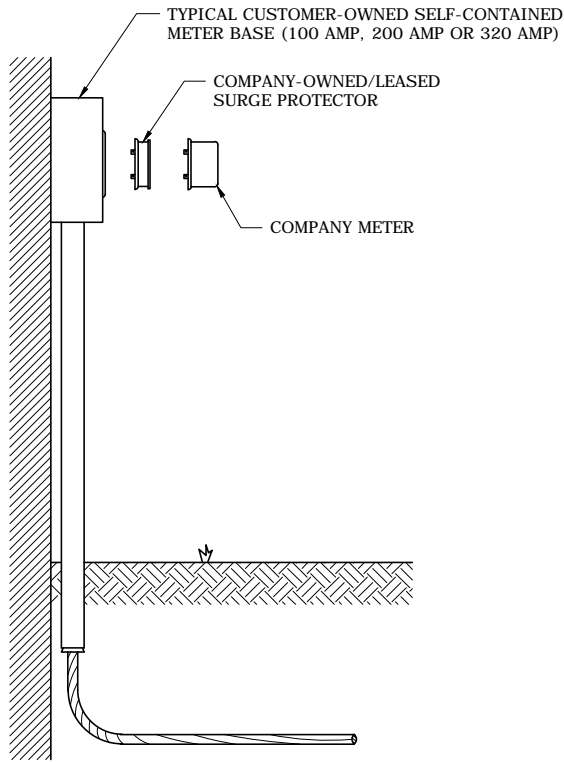


3				
2				
1				
0	11/20/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

DEVICES INSTALLED BETWEEN  
THE METER AND THE METER SOCKET

DEC	DEM	DEP	DEF
		X	
FIG 45			

### SINGLE-PHASE SELF-CONTAINED



#### NOTES:

1. FITS 100 AMP, 200 AMP AND 320 AMP SELF-CONTAINED METER BASES.
2. COMPANY-OWNED/LEASED SURGE PROTECTOR TO BE INSTALLED BETWEEN METER BASE AND METER BY COMPANY-APPROVED LICENSED ELECTRICIAN.
3. OUTAGE SCHEDULED BY ELECTRICIAN WITH CUSTOMER THROUGH THE CUSTOMER SERVICE CENTER.
4. ELECTRICIAN RESPONSIBLE FOR OBTAINING ELECTRICAL INSPECTION, IF REQUIRED.

### THREE-PHASE

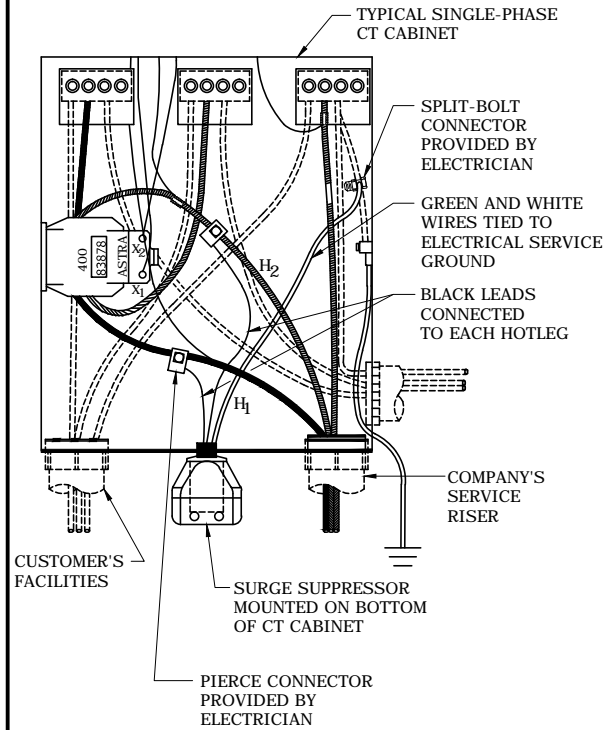


PEMCO MODEL # EXT50C

#### NOTES:

1. COMPANY-OWNED/LEASED SURGE PROTECTORS TO BE INSTALLED ONLY IN CUSTOMER MAIN DISCONNECT PANEL BY COMPANY-APPROVED LICENSED ELECTRICIAN.
2. SURGE PROTECTORS SHALL NOT BE INSTALLED IN PAD-MOUNTED TRANSFORMERS OR CT CABINETS.
3. OUTAGE, IF REQUIRED, SCHEDULED BY ELECTRICIAN WITH CUSTOMER THROUGH THE CUSTOMER SERVICE CENTER.
4. ELECTRICIAN RESPONSIBLE FOR OBTAINING ELECTRICAL INSPECTION, IF REQUIRED.

### SINGLE-PHASE T-RATED



PEMCO MODEL # SS400HW

#### NOTES:

1. COMPANY-OWNED/LEASED SURGE PROTECTOR TO BE INSTALLED IN CT CABINET (SINGLE-PHASE INSTALLATIONS ONLY) BY COMPANY-APPROVED LICENSED ELECTRICIAN.
2. CT CABINET TO BE SECURED BY ELECTRICIAN FOLLOWING WORK COMPLETION.

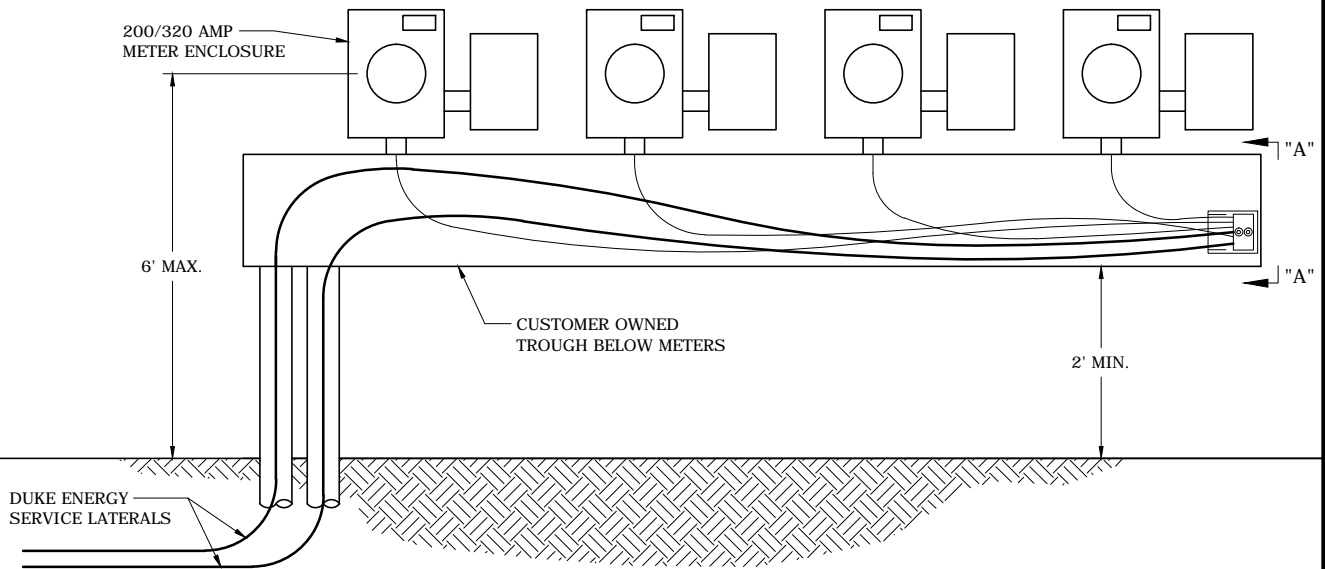


DEC	DEM	DEP	DEF
X		X	

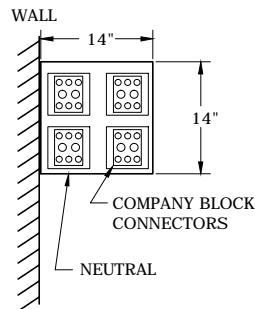
**FIG 46**

SINGLE OR THREE-PHASE COMPANY OWNED/LEASED  
SURGE PROTECTOR INSTALLATIONS

3				
2				
1				
0	11/30/10	SIMPSON	SIMPSON	ELKINS
REVISED	BY	CK'D	APPR.	



MINIMUM TROUGH DIMENSIONS  
REQUIRED BY COMPANY.  
THE NATIONAL ELECTRICAL  
CODE MAY REQUIRE A LARGER  
TROUGH. SEE NOTE 1.



SECTION "A"-"A"

**NOTES:**

1. CUSTOMER TO OWN, INSTALL, AND MAINTAIN TROUGH (GUTTER) TO REQUIREMENTS OF NATIONAL ELECTRICAL CODE AND COMPANY REQUIREMENTS. THE MINIMUM DIMENSIONS MUST BE 14" HIGH X 14" DEEP. THE LENGTH WILL VARY ACCORDING TO THE NUMBER OF METERS. TO ALLOW FOR GOOD WIRING METHODS, THE COMBINED NUMBER OF CUSTOMER CABLES SHOULD NOT EXCEED SIX (6) PER PHASE WHICH INCLUDES THE SERVICE ENTRANCE GROUNDING CONDUCTOR. THE CONNECTORS WILL ACCOMMODATE UP TO 6-600 KCMIL COPPER OR ALUMINUM PER PHASE. CONNECTORS ALSO ACCOMMODATE 2-750 KCMIL CONDUCTORS PER PHASE FOR COMPANY CONDUCTORS.
2. CUSTOMER TO INSTALL METER SOCKETS AS SPECIFIED BY THE COMPANY. DISCONNECTS MUST BE GROUPED PER N.E.C. ARTICLES 230.71 AND 72 AND APPROVED BY THE LOCAL AHJ.
3. POINT OF DELIVERY WILL BE WHERE CUSTOMER'S CONDUCTORS ATTACH TO COMPANY'S CONDUCTORS IN CUSTOMER'S TROUGH. SEE FIGURE 14A FOR TROUGH GROUNDING DETAILS.
4. PER N.E.C. ARTICLE 230.40 EXCEPTION #2, UP TO 6 CIRCUITS CAN BE INSTALLED AT A LOCATION AS LONG AS ALL CIRCUITS ARE FED FROM THE SAME TRANSFORMER (TRANSFORMER BANK) AND ALL CIRCUITS ARE TIED TOGETHER ONLY AT THE TRANSFORMER AND THE CONDUCTOR SIZE IS GREATER THAN OR EQUAL TO 1/0. A CIRCUIT CAN CONSIST OF PARALLEL CONDUCTORS.  
DEC: CUSTOMER PROVIDES HOLES IN TROUGH FOR COMPANY RISERS.
5. LABELING OF EACH METER ENCLOSURE SHALL MEET THE REQUIREMENTS ON FIGURE 3.
6. SINGLE CONDUCTOR SHOWN FOR CLARITY.

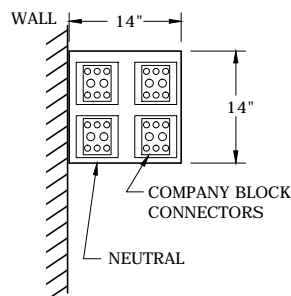
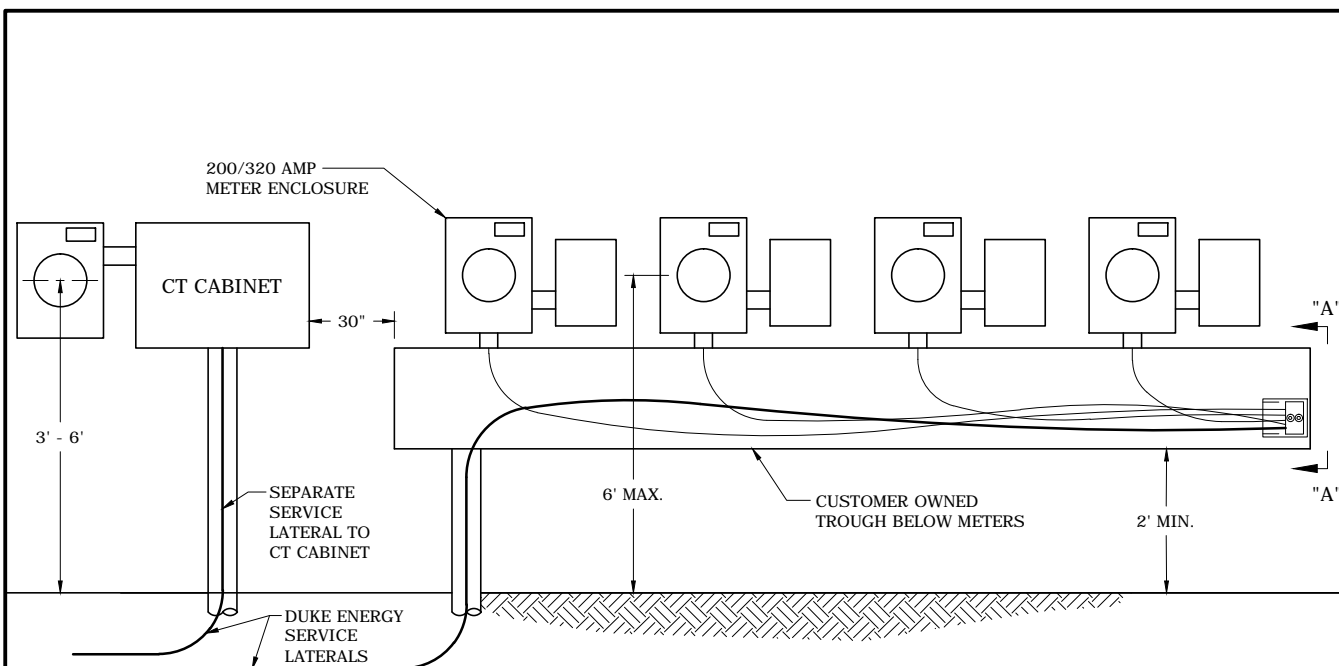


DEC	DEM	DEP	DEF
X		X	

FIG 47A

3				
2				
1				
0	1/22/16	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

**TROUGH INSTALLATIONS**  
(ALL SELF-CONTAINED METERS)



SECTION "A"-"A"  
SEE NOTE 1

**NOTES:**

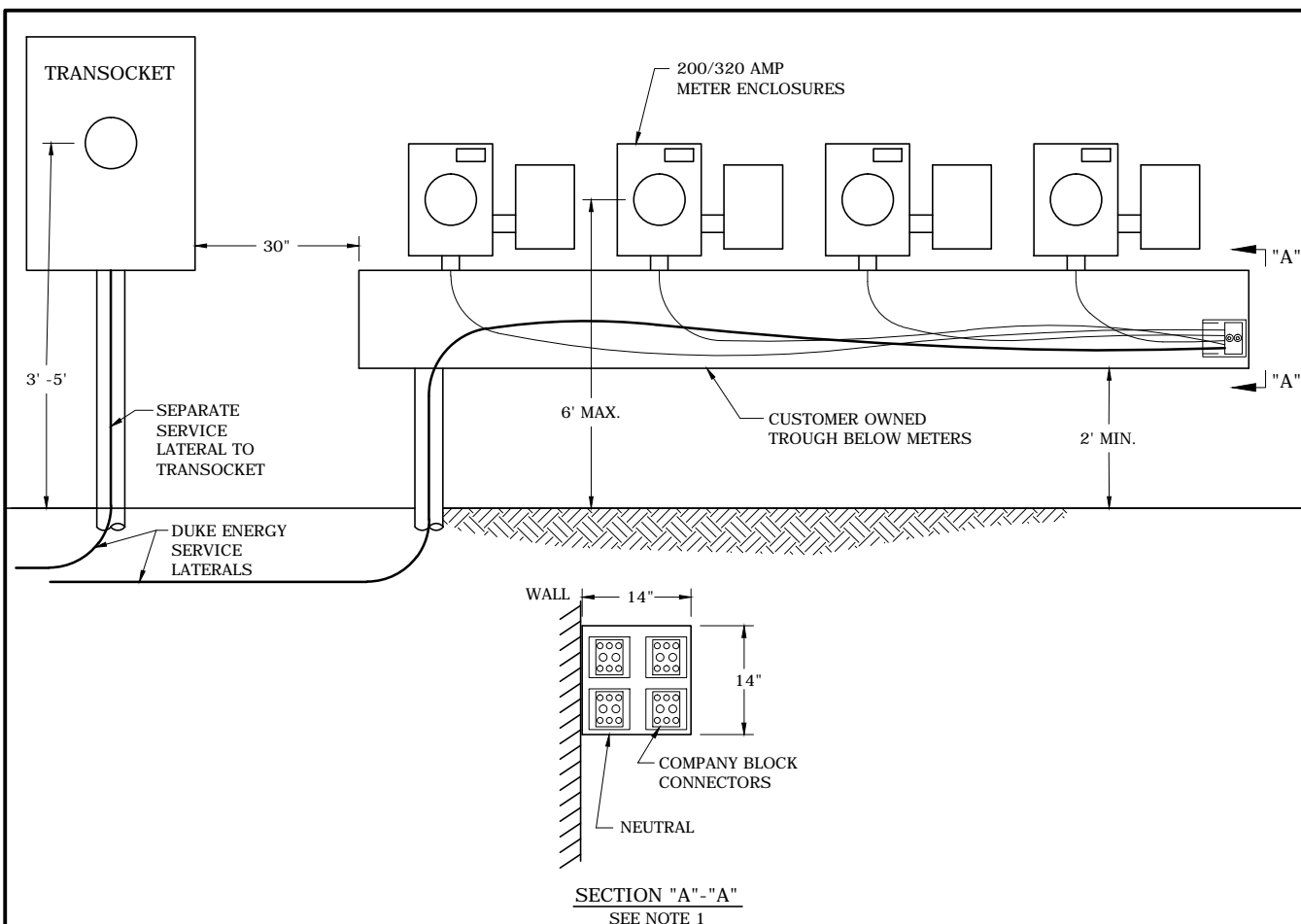
1. MINIMUM TROUGH DIMENSIONS REQUIRED BY COMPANY. THE NATIONAL ELECTRICAL CODE MAY REQUIRE A LARGER TROUGH. SEE FIGURE 47A FOR TROUGH SPECIFICATIONS AND CONDUCTOR CONNECTION DETAILS.
2. SEE FIGURES 14A AND 14B FOR GROUNDING DETAILS.
3. SINGLE CONDUCTOR SHOWN FOR CLARITY.
4. FOR DEC: CUSTOMER CUTS HOLES IN TROUGH FOR COMPANY RISERS.
5. REFER TO FIGURES 43A AND 43B FOR CT CABINET DETAILS.
6. PER N.E.C. ARTICLE 230.40 EXCEPTION #2, UP TO 6 CIRCUITS CAN BE INSTALLED AT A LOCATION AS LONG AS ALL CIRCUITS ARE FED FROM THE SAME TRANSFORMER (TRANSFORMER BANK) AND ALL CIRCUITS ARE TIED TOGETHER ONLY AT THE TRANSFORMER AND THE CONDUCTOR SIZE IS GREATER THAN OR EQUAL TO 1/0. A CIRCUIT CAN CONSIST OF PARALLEL CONDUCTORS. DEC: CUSTOMER PROVIDES HOLES IN TROUGH FOR COMPANY RISERS.
7. CUSTOMER TO INSTALL METER SOCKETS AS SPECIFIED BY THE COMPANY. DISCONNECTS MUST BE GROUPED PER N.E.C. ARTICLES 230.71 AND 72 AND APPROVED BY THE LOCAL AHJ.



3				
2				
1				
0	1/22/16	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

TROUGH INSTALLATIONS  
CT CABINETS

DEC	DEM	DEP	DEF
X		X	
FIG 47B			



**NOTES:**

1. MINIMUM TROUGH DIMENSIONS REQUIRED BY COMPANY. THE NATIONAL ELECTRICAL CODE MAY REQUIRE A LARGER TROUGH. SEE FIGURE 47A FOR TROUGH SPECIFICATIONS AND CONDUCTOR CONNECTION DETAILS.
2. SEE FIGURES 14A AND 14B FOR GROUNDING DETAILS.
3. SINGLE CONDUCTOR SHOWN FOR CLARITY.
4. FOR DEC: CUSTOMER CUTS HOLES IN TROUGH FOR COMPANY RISERS.
5. TRANSOCKET MAX SERVICE IS 600 AMPS; MAX CUSTOMER WIRE IS 500 KCMIL SINGLE CONDUCTOR, OR 350 KCMIL TWO CONDUCTORS PER PHASE.
6. COMPANY PROVIDES SEPARATE SERVICE LATERAL TO TRANSOCKET.
7. PER N.E.C. ARTICLE 230.40 EXCEPTION #2, UP TO 6 CIRCUITS CAN BE INSTALLED AT A LOCATION AS LONG AS ALL CIRCUITS ARE FED FROM THE SAME TRANSFORMER (TRANSFORMER BANK) AND ALL CIRCUITS ARE TIED TOGETHER ONLY AT THE TRANSFORMER AND THE CONDUCTOR SIZE IS GREATER THAN OR EQUAL TO 1/0. A CIRCUIT CAN CONSIST OF PARALLEL CONDUCTORS. DEC: CUSTOMER PROVIDES HOLES IN TROUGH FOR COMPANY RISERS.
8. CUSTOMER TO INSTALL METER SOCKETS AS SPECIFIED BY THE COMPANY. DISCONNECTS MUST BE GROUPED PER N.E.C. ARTICLES 230.71 AND 72 AND APPROVED BY THE LOCAL AHJ.



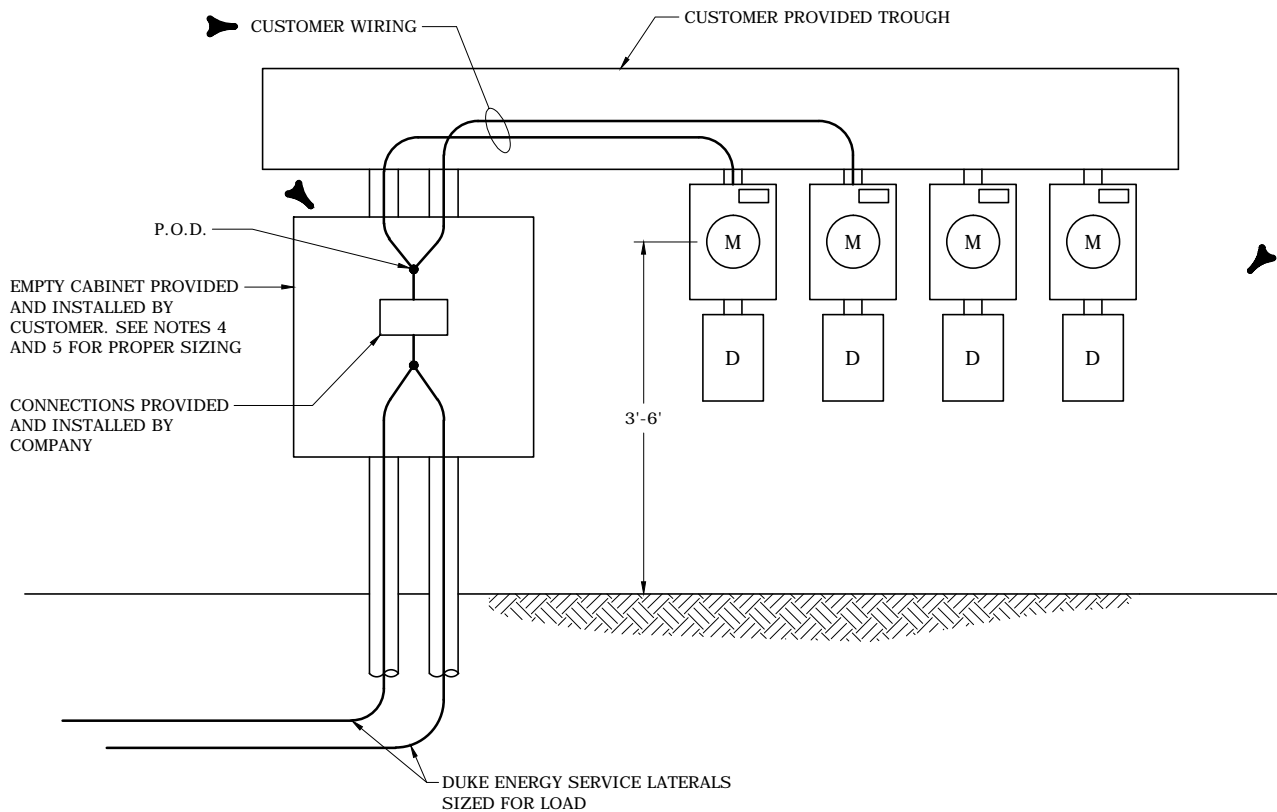
3				
2				
1				
0	1/22/16	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

TROUGH INSTALLATIONS

TRANSOCKETS

DEC	DEM	DEP	DEF
X			
FIG 47C			





#### NOTES:

1. EMPTY CABINET PROVIDED AND INSTALLED BY CUSTOMER IN CASES WHERE CUSTOMER DESIRES TROUGH LOCATION ABOVE COMPANY'S METERS.
2. CUSTOMER CUTS HOLE IN CABINET AND TROUGH. CONDUITS ENTERING CABINET MUST BE TOGETHER, NOT IN SEPARATE CORNERS OR SIDES.
3. SEE FIGURE 14A FOR TROUGH GROUNDING DETAILS. COMPANY GROUNDS CABINET.
4. FOR INSTALLATIONS WITHIN DEC, REFER TO FIG 43A FOR CUSTOMER WIRE SIZE GUIDELINES AND CABINET SIZING.
5. FOR INSTALLATIONS WITHIN DEP, REFER TO FIG 43B FOR CUSTOMER WIRE SIZE GUIDELINES AND CABINET SIZING.
6. CUSTOMER TO INSTALL METER SOCKETS AS SPECIFIED BY THE COMPANY. DISCONNECTS MUST BE GROUPED PER N.E.C. ARTICLES 230.71 AND 72 AND APPROVED BY THE LOCAL AHJ.

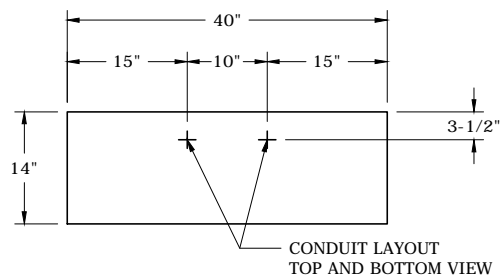
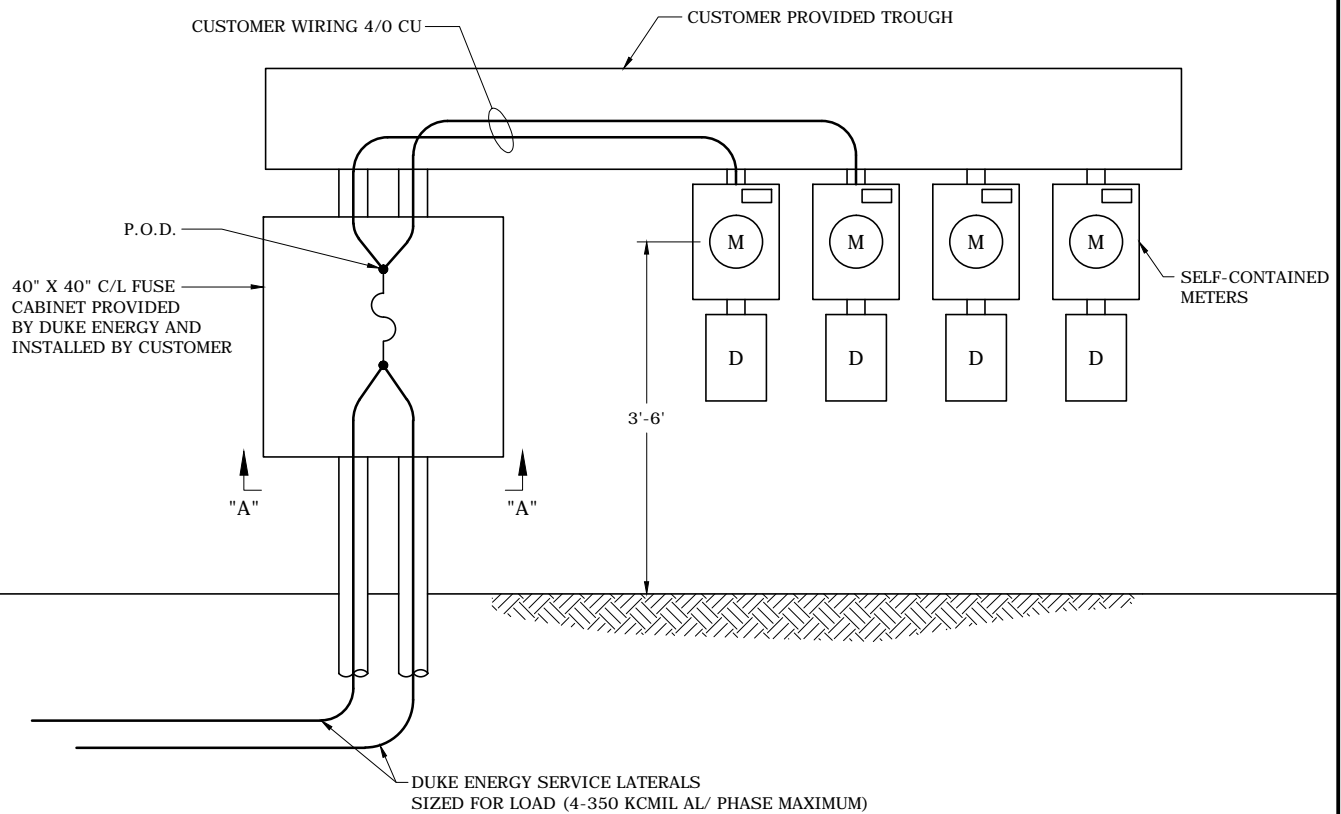


3				
2				
1	6/29/16	EANES	FLETCHER	ADCOCK
0	1/22/16	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

#### TROUGH INSTALLATIONS

➤ TROUGH LOCATED ABOVE COMPANY'S METERS

DEC	DEM	DEP	DEF
X		X	
FIG 47D			



SECTION "A"-"A"

NOTES:

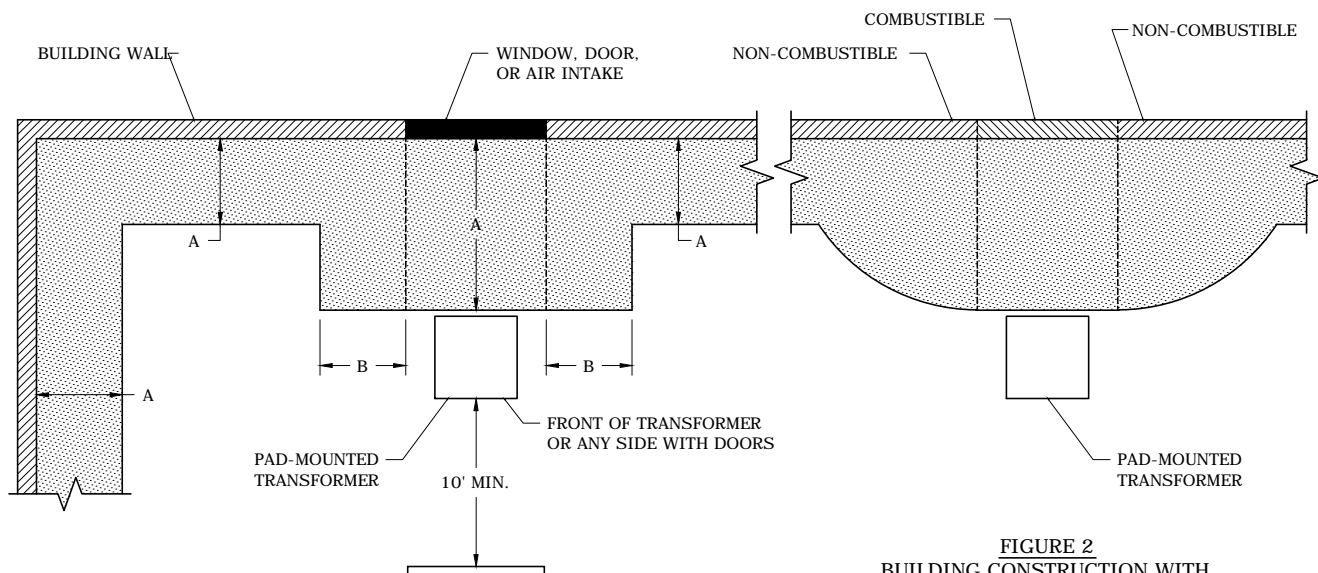
1. C/L FUSE CABINET AND FUSES PROVIDED BY DUKE ENERGY AND INSTALLED BY CUSTOMER IN CASES WHERE FAULT CURRENT EXCEEDS RATING OF METER.
2. CUSTOMER CUTS HOLE IN C/L FUSE CABINET AND TROUGH.
3. SEE FIGURE 14A FOR TROUGH GROUNDING DETAILS. COMPANY GROUNDS C/L FUSE CABINET.
4. COMPANY LOAD-SIDE CONNECTOR CAN ACCEPT UP TO 6 - 4/0 CU CONDUCTORS PER PHASE MAXIMUM.
5. COMPANY SOURCE-SIDE CONNECTOR CAN ACCEPT UP TO 4 - 350 KCMIL AL CONDUCTORS PER PHASE MAXIMUM.
6. CUSTOMER TO INSTALL METER SOCKETS AS SPECIFIED BY THE COMPANY. DISCONNECTS MUST BE GROUPED PER N.E.C. ARTICLES 230.71 AND 72 AND APPROVED BY THE LOCAL AHJ.



3				
2				
1				
0	6/29/16	EANES	FLETCHER	ADCOCK
REVISED	BY	CK'D	APPR.	

TROUGH INSTALLATIONS  
CURRENT LIMITING FUSE CABINET  
208Y/120V OR 240 VOLT DELTA SERVICE

DEC	DEM	DEP	DEF
X			
FIG 47E			



**FIGURE 1**  
ALLOWABLE CLEARANCES

**FIGURE 2**  
BUILDING CONSTRUCTION WITH  
COMBUSTIBLE AND NON-COMBUSTIBLE  
MATERIAL (SEE NOTE 5)

TYPE OF CONSTRUCTION	DIMENSION A: CLEARANCE EXTENDING OUT FROM BUILDING (FT)	DIMENSION B: SIDE CLEARANCE MEASURED FROM EDGE OF WINDOW, DOOR, ETC. (FT)
NON-COMBUSTIBLE WALLS	3	N/A
COMBUSTIBLE WALLS	10	N/A
DOORS	20	10
WINDOWS (FIRST STORY)	10	10
WINDOWS (SECOND STORY)	REFER TO WALL TYPE	REFER TO WALL TYPE
AIR INTAKES	10	10
FIRE ESCAPES	20	20

**NOTES:**

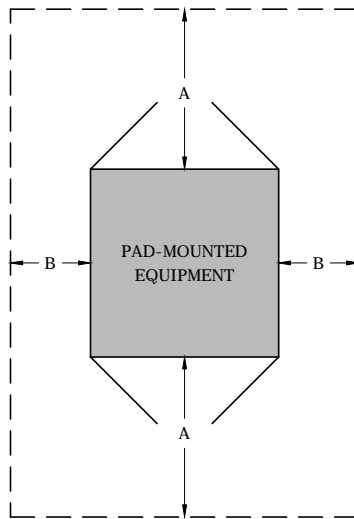
1. ADEQUATE PASSAGEWAYS TO ACCOMMODATE CRANES, LINE TRUCKS, OR OTHER NECESSARY LIFTING AND HAULING EQUIPMENT SHALL BE PROVIDED TO ALLOW FOR MAINTENANCE, OPERATION, OR REPLACEMENT.
2. DISTANCES ARE FROM THE PAD OR TRANSFORMER CASING, WHICHEVER IS CLOSER TO THE BUILDING OR OPENING.
3. IF THE BUILDING HAS AN OVERHANG, THE DISTANCE IS MEASURED FROM THE OUTSIDE EDGE OF THE OVERHANG.
4. OUTSIDE WALKWAYS OR STAIRS ATTACHED TO THE BUILDING SHALL BE CONSIDERED AS PART OF THE BUILDING.
5. IF A BUILDING IS CONSTRUCTED OF BOTH COMBUSTIBLE AND NON-COMBUSTIBLE MATERIALS, NO PART OF THE PAD-MOUNTED TRANSFORMER CAN BE WITHIN THE ALLOWABLE DISTANCE FOR THE COMBUSTIBLE MATERIALS IN ANY DIRECTION.
6. DISTANCES LESS THAN THOSE SPECIFIED MAY BE ALLOWED IF APPROVED BY THE APPROPRIATE CODE ENFORCEMENT AUTHORITY, BUT IN NO CASE SHALL DISTANCES TO A BUILDING BE LESS THAN 3 FT. THIS MAY REQUIRE ALTERNATE MEANS OF FIRE PROTECTION INCLUDING FIRE BARRIERS, FIRE RATED WALLS, OIL CONTAINMENT MEANS, OR OTHER APPROVED MEASURES.
7. FIRE-RATED WALLS AROUND TRANSFORMERS MUST BE A MINIMUM OF 1'-0" ABOVE THE ANTICIPATED HEIGHT OF THE INSTALLED TRANSFORMER. NO WALL, WHETHER FOR FIRE PROTECTION OR AESTHETIC PURPOSES, CAN BE HIGH ENOUGH TO PREVENT DUKE ENERGY'S INSTALLATION AND FUTURE MAINTENANCE OF THE TRANSFORMER WITH STANDARD EQUIPMENT AND LIFTING DEVICES AS DETERMINED BY DUKE ENERGY.
8. FINAL GRADE AT THE LOCATION OF THE PAD-MOUNTED TRANSFORMER SHALL PROVIDE FOR MINERAL OIL TO DRAIN FROM THE BUILDING. OTHERWISE, AN OIL CONTAINMENT MEANS IS REQUIRED.
9. CLEARANCES LISTED ARE DUKE ENERGY MINIMUM REQUIREMENTS. THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) MAY HAVE REQUIREMENTS THAT ARE MORE STRINGENT. IT SHALL BE THE CUSTOMER'S RESPONSIBILITY TO CONFORM TO ALL LOCAL BUILDING CODES, INSURANCE REGULATIONS, OR ORDINANCES AFFECTING THE TRANSFORMER LOCATION.



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0	10/28/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

**PAD-MOUNTED TRANSFORMER CLEARANCES**  
**FROM BUILDINGS**

DEC	DEM	DEP	DEF
X		X	
<b>FIG 52</b>			



MINIMUM CLEAR WORKING SPACE AROUND PAD-MOUNTED EQUIPMENT		
TYPE OF PAD-MOUNTED EQUIPMENT	DIMENSION A DOOR SIDES (FT)	DIMENSION B (FT)
TRANSFORMERS (SEE NOTE 4)	10	3
SWITCHGEAR (SEE NOTE 3)	10	5
RECLOSERS, PRIMARY METERS, ETC.	10	3

MISCELLANEOUS CLEARANCES	
TYPE OF EQUIPMENT	CLEARANCE IN ANY DIRECTION (FT)
FUEL OR GAS DISPENSERS	20
CONTAINERS STORING FLAMMABLE LIQUID OR GAS	10
CUSTOMER-OWNED GENERATORS OR TRANSFORMERS	10
FIRE HYDRANTS	(SEE NOTE 7)
NATURAL GAS METERS	3

**NOTES:**

1. ADEQUATE PASSAGEWAYS TO ACCOMMODATE CRANES, LINE TRUCKS, OR OTHER NECESSARY LIFTING AND HAULING EQUIPMENT SHALL BE PROVIDED TO ALLOW FOR MAINTENANCE, OPERATION, OR REPLACEMENT.
2. DISTANCES ARE FROM THE PAD OR SURFACE MOUNTED EQUIPMENT, WHICHEVER IS CLOSER TO THE OBJECT IN QUESTION.
3. A MINIMUM CLEAR WORKING SPACE OF 5 FT MUST BE MAINTAINED FROM EACH NON-DOOR SIDE OF THE EQUIPMENT (TO ACCOMMODATE CONTROL CABINETS, ETC.).
4. WHERE A METER IS MOUNTED TO A TRANSFORMER, A CLEAR SPACE AROUND THE METER OF AT LEAST 3 FT WIDE, 4 FT DEEP, AND 8 FT HIGH MUST BE PROVIDED AND ALWAYS AVAILABLE FOR READING, INSPECTING, TESTING, AND MAINTENANCE OPERATIONS.
5. DISTANCES LESS THAN THOSE SPECIFIED MAY BE ALLOWED IF APPROVED BY THE APPROPRIATE CODE ENFORCEMENT AUTHORITY. THIS MAY REQUIRE ALTERNATE MEANS OF FIRE PROTECTION INCLUDING FIRE BARRIERS, FIRE RATED WALLS, SPRINKLER SYSTEMS, OIL CONTAINMENT MEANS, OR OTHER APPROVED MEASURES.
6. IT SHALL BE THE CUSTOMER'S RESPONSIBILITY TO CONFORM TO ALL LOCAL BUILDING CODES, INSURANCE REGULATIONS, OR ORDINANCES AFFECTING THE EQUIPMENT LOCATION.
7. 4 FT, MAY BE REDUCED TO 3 FT BY AGREEMENT WITH LOCAL FIRE AUTHORITY.



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0	1/18/16	EANES	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

**PAD-MOUNTED EQUIPMENT WORKING SPACE  
AND MISCELLANEOUS CLEARANCES**

DEC	DEM	DEP	DEF
X		X	

**FIG 53**

PAD-MOUNTED TRANSFORMER SIZE (KVA)	DEP ONLY MAXIMUM NUMBER OF CUSTOMER CONDUCTORS PER PHASE IN PAD-MOUNTED TRANSFORMERS		DEC ONLY MAXIMUM NUMBER OF CONDUCTORS PER PHASE IN PAD-MOUNTED TRANSFORMERS	
	480Y/277	208Y/120	CONDUCTOR SIZES 350MCM TO 600MCM	CONDUCTOR SIZES 700MCM TO 750MCM
75	12	12	10	8
150	12	12	10	8
225 *	N/A	N/A	10	8
300	12	12	10	8
500	12	12	10	8
750	12	16	10	8
1000	12	16	10	8
1500	16	N/A	10	8
2000 *	N/A	N/A	10	8
2500	16	N/A	10	8
3750 **	16	N/A	N/A	N/A

\* DEC ONLY

\*\* DEP ONLY

NOTES:

1. IF THE RECOMMENDED CONDUCTOR LIMITS ABOVE ARE EXCEEDED, A SECONDARY BUSS ENCLOSURE WILL BE REQUIRED. CONTACT COMPANY REPRESENTATIVE FOR DETAILS.
2. MAXIMUM CUSTOMER CONDUCTOR SIZE IS 750 KCML CU/AL.
3. PARALLELED CUSTOMER CONDUCTORS MUST BE "RUNG OUT" (OHMED OUT) PRIOR TO ENERGIZING TO PREVENT CROSS PHASING.
4. ALL NEW THREE-PHASE PAD-MOUNTED TRANSFORMERS WITH A 4160Y/2400 VOLT SECONDARY HAVE SECONDARY LIVE-FRONT BUSHINGS WITH A 4-HOLE SPADE (0.56" DIAMETER BOLT HOLES ON 1.75" CENTERS).
- 5. 208Y/120V SECONDARY VOLTAGE NOT AVAILABLE IN EITHER AREA FOR SIZES GREATER THAN 1000 KVA.

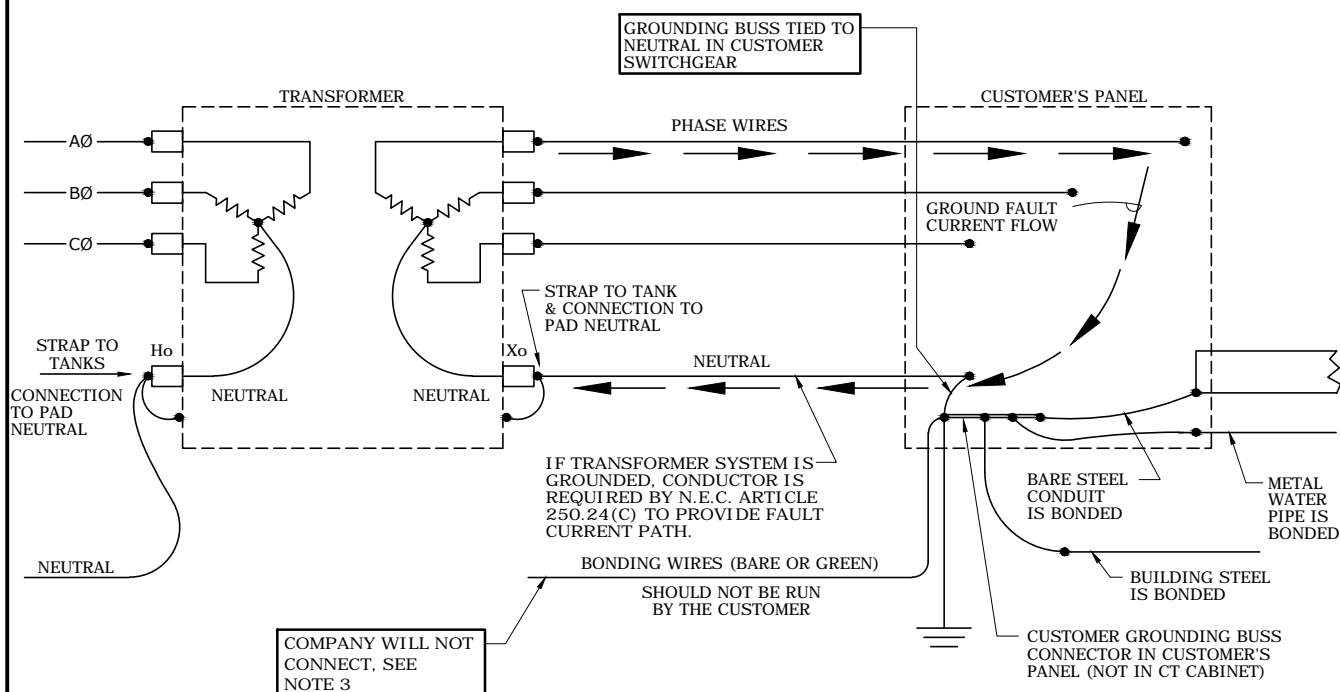


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1	6/29/16	EANES	FLETCHER	ADCOCK
0	2/1/16	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

MAXIMUM NUMBER OF CUSTOMER  
CONDUCTORS IN SECONDARY COMPARTMENT  
OF THREE-PHASE PAD-MOUNTED TRANSFORMERS

DEC	DEM	DEP	DEF
X		X	

FIG 58



#### NOTES:

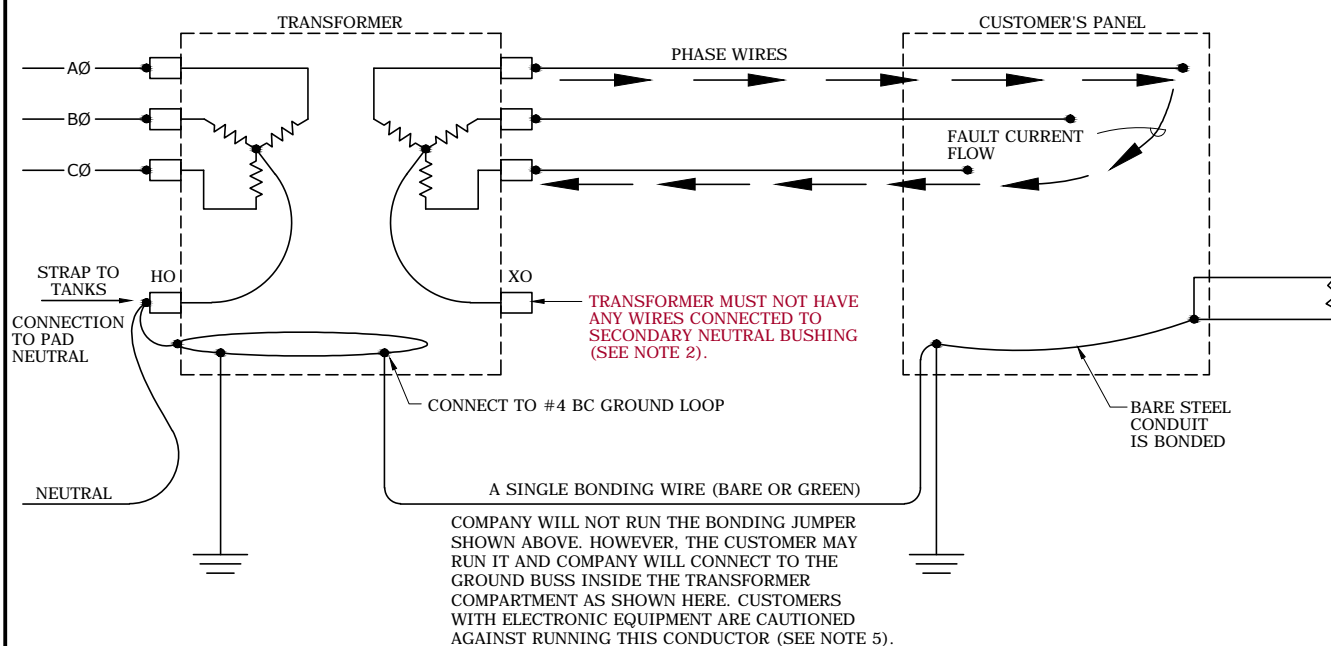
1. IF THE TRANSFORMER SECONDARY NEUTRAL IS GROUNDED, THE CUSTOMER MUST CONNECT A CONDUCTOR FROM THEIR PANEL TO THE TRANSFORMER. THIS NEUTRAL CONDUCTOR PROVIDES A PATH FOR GROUND FAULT CURRENT TO FLOW.
2. A TRANSFORMER CONNECTED FOR FOUR WIRE SERVICE (GROUNDED NEUTRAL) CANNOT SUPPLY THREE WIRE SERVICES.
3. A SEPARATE BONDING CONDUCTOR OR CONDUCTORS ARE NOT NECESSARY. ELECTRICIANS SHOULD BE ADVISED NOT TO RUN BONDING CONDUCTORS. IF THEY INSIST ON RUNNING BONDING CONDUCTORS, DUKE ENERGY WILL NOT CONNECT THEM TO ANY COMPANY EQUIPMENT.
4. NOTE FOR DELIVERY VOLTAGES OF 4160Y/2400 VOLTS THREE-PHASE 4-WIRE AND 2400 VOLT THREE-PHASE 3-WIRE DELTA: N.E.C. REQUIRES CUSTOMER CABLES TO BE TERMINATED WITH VOLTAGE STRESS RELIEF TERMINATOR (CABLES RATED 25 KV AND HIGHER, N.E.C. ARTICLE 310.10(E)).



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0	11/2/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

#### FOUR WIRE SERVICES, GROUNDED WYE CONNECTION

DEC	DEM	DEP	DEF
X		X	
FIG 59			



#### NOTES:

1. BONDING WIRE SHALL BE ONE CONDUCTOR ONLY, TYPICALLY A SMALL CONDUCTOR EASY TO ATTACH TO #4 BC GROUND LOOP IN PAD-MOUNT.
2. IF THE TRANSFORMER IS CONNECTED FOR THREE WIRE SERVICE, THE SECONDARY IS CONNECTED FLOATING WYE. THE SECONDARY NEUTRAL BUSHING MUST BE CLEAR OF ALL CONNECTIONS, INCLUDING THE SECONDARY NEUTRAL BUSHING GROUND STRAP. THE SECONDARY NEUTRAL BUSHING MUST BE UNGROUNDED SO FAULT CURRENT WILL ONLY FLOW IN THE PHASE WIRES.

#### ONE EXCEPTION:

IF CUSTOMER HAS A HIGH RESISTANCE GROUND DETECTION SYSTEM, THEY WILL WANT TO RUN ONE SMALL CONDUCTOR (EX. #12) TO ATTACH TO XO. THIS IS PERMITTED. GROUND STRAP IS STILL NOT CONNECTED IN THIS CASE. IF THERE ARE ANY QUESTIONS ABOUT THIS, CONTACT DISTRIBUTION STANDARDS.

3. A TRANSFORMER CONNECTED FOR THREE WIRE SERVICE (NO NEUTRAL) CANNOT SUPPLY FOUR WIRE SERVICES.
4. DUKE ENERGY SHALL RUN A BONDING CONDUCTOR (#4 BC) FROM THE GROUND LOOP TO THE METERING LOCATION TO BOND THE METER BOX MOUNTED ON THE WALL OF THE TRANSFORMER TANK. IF THE METER BOX IS MOUNTED TO THE CUSTOMER'S WALL, THE BONDING CONDUCTOR SHALL BE ATTACHED TO THE CUSTOMER'S GROUND.
5. CUSTOMER SHOULD BE AWARE THAT A THREE WIRE SERVICE SHOULD ONLY BE USED IN SPECIAL CASES. CUSTOMER MUST HAVE A GROUND DETECTION SYSTEM INSTALLED N.E.C. ARTICLE 250.21(B). CUSTOMER HAVING ELECTRONIC LOADS SUCH AS VARIABLE SPEED DRIVES OR LIGHTNING CONCERNS SHOULD CONSIDER A GROUNDED WYE CONNECTION.
6. NOTE FOR DELIVERY VOLTAGES OF 4160Y/2400 VOLTS THREE-PHASE 4-WIRE AND 2400 VOLT THREE-PHASE 3-WIRE DELTA: N.E.C. REQUIRES CUSTOMER CABLES TO BE TERMINATED WITH VOLTAGE STRESS RELIEF TERMINATOR (CABLES RATED 25 KV AND HIGHER, N.E.C. ARTICLE 310.10(E)).

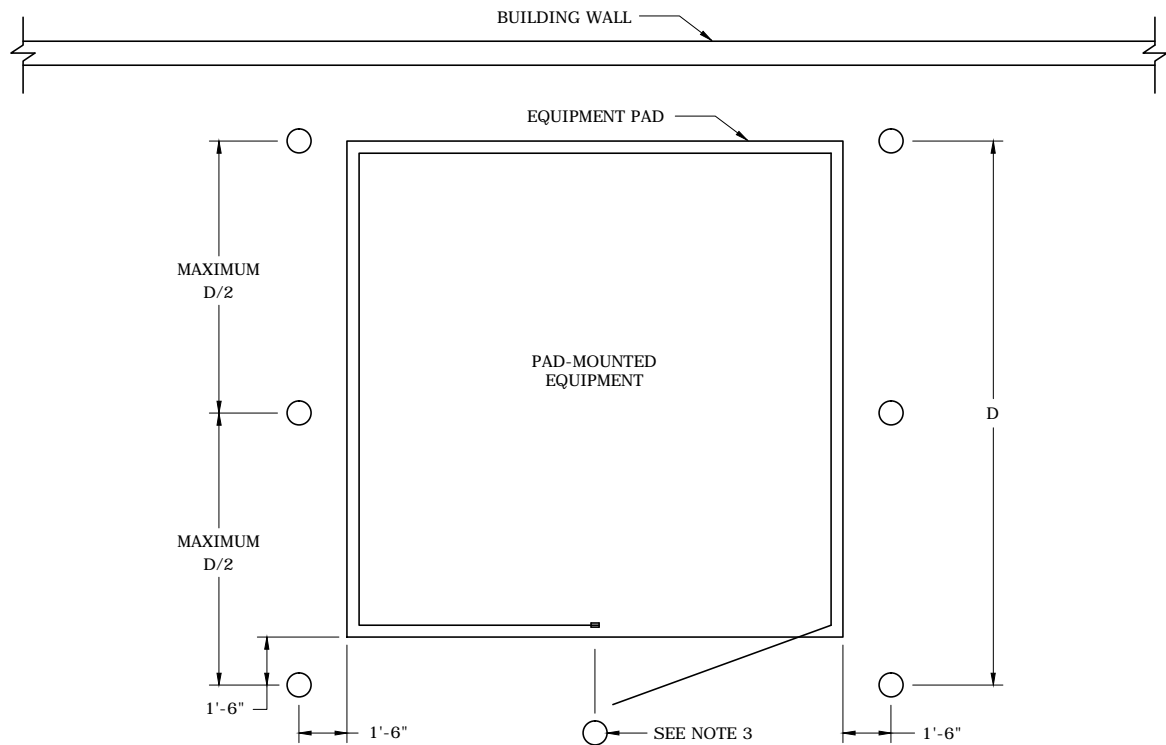


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0	11/2/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

### THREE WIRE SERVICES, FLOATING WYE CONNECTION

DEC	DEM	DEP	DEF
X		X	

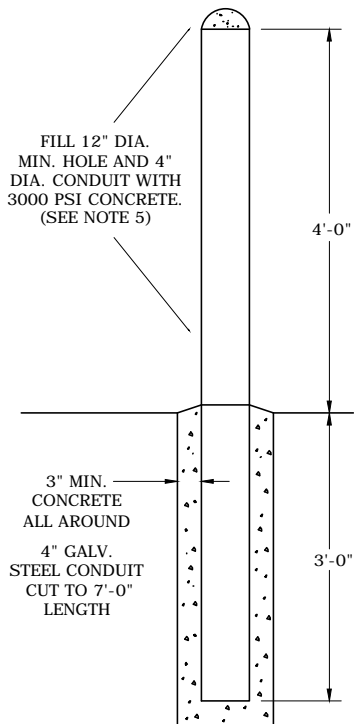
FIG 60



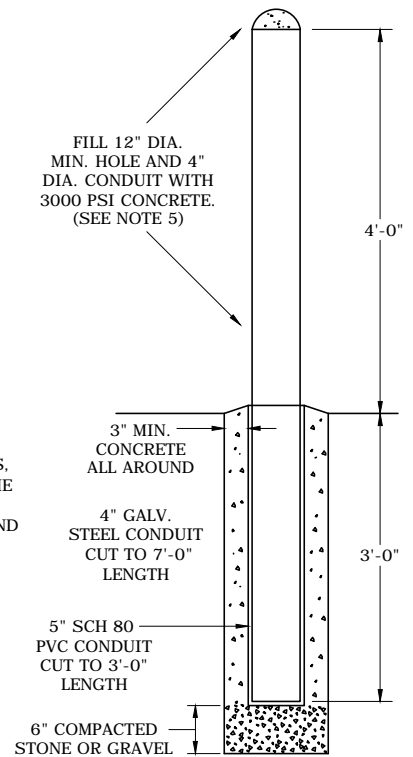
PLAN VIEW

NOTES:

1. PROTECTIVE POLES CAN BE INSTALLED ON ALL SIDES OF PAD-MOUNTED EQUIPMENT THAT ARE SUBJECT TO REGULAR VEHICLE TRAFFIC. THEIR USE IS AT THE DISCRETION OF LOCAL ENGINEERING AND WILL BE THE CUSTOMER'S RESPONSIBILITY TO PROVIDE AND INSTALL AFTER ALL REASONABLE EFFORTS TO LOCATE THE PAD-MOUNTED EQUIPMENT ELSEWHERE HAVE BEEN EXHAUSTED.
2. POLES SHOULD BE EVENLY SPACED ALONG THE SIDES OF THE PAD-MOUNTED EQUIPMENT. NO WIDER THAN HALF THE DIMENSION OF THE SIDE THEY ARE PROTECTING. EXCEPTIONS TO THIS ALONG SIDES WITH DOORS ARE ALLOWED IN ORDER TO ACCOMMODATE NOTE 3.
3. ON ANY SIDE OF PAD-MOUNTED EQUIPMENT WITH DOORS, THIS POLE SHOULD BE CENTRALLY LOCATED BETWEEN THE DOORS AND MUST ACCOMMODATE THE DOOR SWING OF THE EQUIPMENT. IT SHALL BE EITHER REMOVABLE BY HAND OR COLLAPSIBLE. REMOVABLE OR COLLAPSIBLE DESIGNS OTHER THAN WHAT ARE SHOWN MUST BE APPROVED BY LOCAL ENGINEERING.
4. POLES LOCATED ON ANY SIDE OF PAD-MOUNTED EQUIPMENT SHALL NOT INTERFERE WITH THE SAFE OPERATION AND EXPECTED MAINTENANCE OR REPLACEMENT OF THAT EQUIPMENT.
5. POLES SHALL BE PAINTED YELLOW OR OUTFITTED WITH A YELLOW BOLLARD COVER OR POST SLEEVE.
6. ALL POLES SHALL HAVE A 2" REFLECTIVE TAPE APPLIED EITHER AROUND THE TOP OF THE BOLLARD OR EXTENDING VERTICALLY DOWN THE LENGTH OF THE BOLLARD FOR 24". VERTICAL APPLICATIONS MUST BE ON THE SIDE FACING ANY ANTICIPATED TRAFFIC.



STANDARD POLE



REMOVABLE POLE

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0	10/28/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

PROTECTIVE POLES FOR PAD-MOUNTED EQUIPMENT



DEC	DEM	DEP	DEF
X		X	

FIG 61



DELIVERY VOLTAGE (SEE NOTE 1)	NUMBER OF SERVICE WIRES	MINIMUM LOAD (KW)	MAXIMUM LOAD (KW)	TYPE OF METER
120	2	1	12	SELF-CONTAINED CL 320 AMP
120/240	3	1	24/48/77 (SEE NOTE 2)	SELF-CONTAINED CL 320 AMP
240/120	4	10	40/80/133 (SEE NOTE 2)	SELF-CONTAINED CL 320 AMP
120/208	3 (NETWORK)	1	12 (SEE NOTE 3)	SELF-CONTAINED CL 320 AMP
120/240	3	78	182	T-RATED CL 20
208/120	4	10	36/72/115 (SEE NOTE 2)	SELF-CONTAINED CL 320 AMP
208/120	4	116	650	T-RATED CL 20
480/277 (SEE NOTE 4)	4	75	3200	T-RATED CL 20
480	3	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
> 600 VOLTS (SEE NOTE 4)	4 WIRE WYE	BASED ON CT SIZE	BASED ON CT SIZE	T-RATED CL 20
> 600 VOLTS	ALL THREE-PHASE DELTAS	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE

NOTES:

1. COMPANY PROVIDES SERVICE TRANSFORMATION ON ALL VOLTAGES BELOW 600 VOLTS. CUSTOMER PROVIDES SERVICE TRANSFORMATION ON VOLTAGES GREATER THAN 600 VOLTS.
2. MAXIMUM LOAD RATINGS ARE BASED ON AMPERE RATING OF METER SOCKET: 100 AMP/ 200 AMP/ 320 AMP. FOR INSTANCE, MAXIMUM LOAD ON 320 AMP RATED METER SOCKET (400 AMP METER SOCKET WITH 320 AMP METER IS DERATED TO MATCH THE METER) AT UNITY POWER FACTOR, IS 320 AMPS FOR CONTINUOUS LOAD, OR 77 KW AT SINGLE-PHASE OR 115 KW AT THREE-PHASE. ALL SELF-CONTAINED METERS ARE CL 320 AMP.
3. LIMIT OF 12 KW MAXIMUM FOR INDIVIDUAL METER INSTALLATIONS THAT ARE SERVED FROM THREE-PHASE SYSTEMS IN ORDER TO KEEP SYSTEM BALANCED. HIGHER LOADS (21/42/67 KW) MAY BE PERMITTED IF BALANCED ACROSS THREE-PHASE SYSTEM.
4. WILL BE METERED USING POTENTIAL TRANSFORMERS TO STEP THE VOLTAGE DOWN TO 120 VOLTS FOR THE METER, AND IF REQUIRED, CURRENT TRANSFORMERS TO REDUCE THE CURRENT GOING THROUGH THE METER.
5. 120/240V 3 WIRE SINGLE-PHASE LOADS SERVED FROM 240/120 VOLT THREE-PHASE BANKS MUST BE CONNECTED PER FIGURE 32.

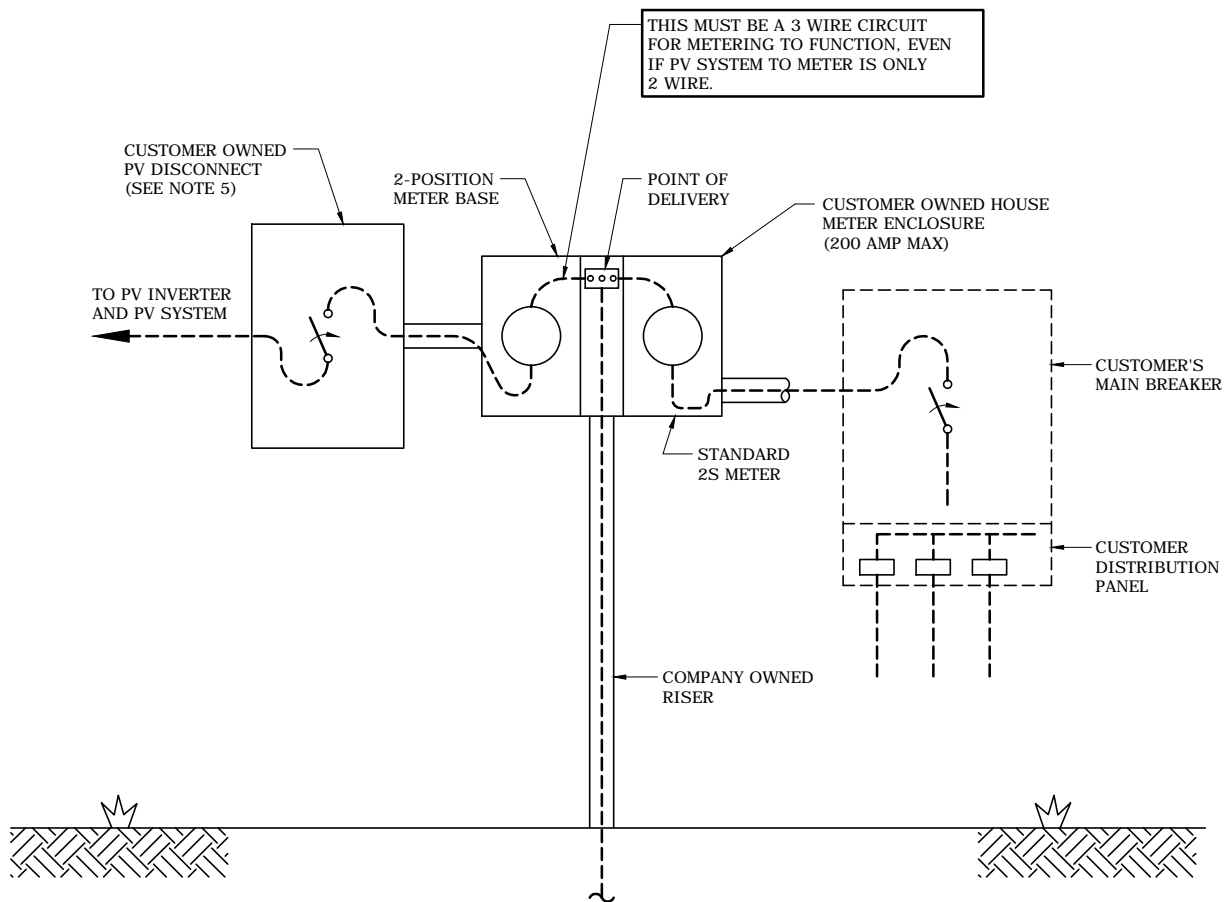
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0	10/28/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

SELL ALL AND INDEPENDENT GENERATION  
SERVICE AND METER STANDARDS



DEC	DEM	DEP	DEF
		X	

FIG 62



**NOTES:**

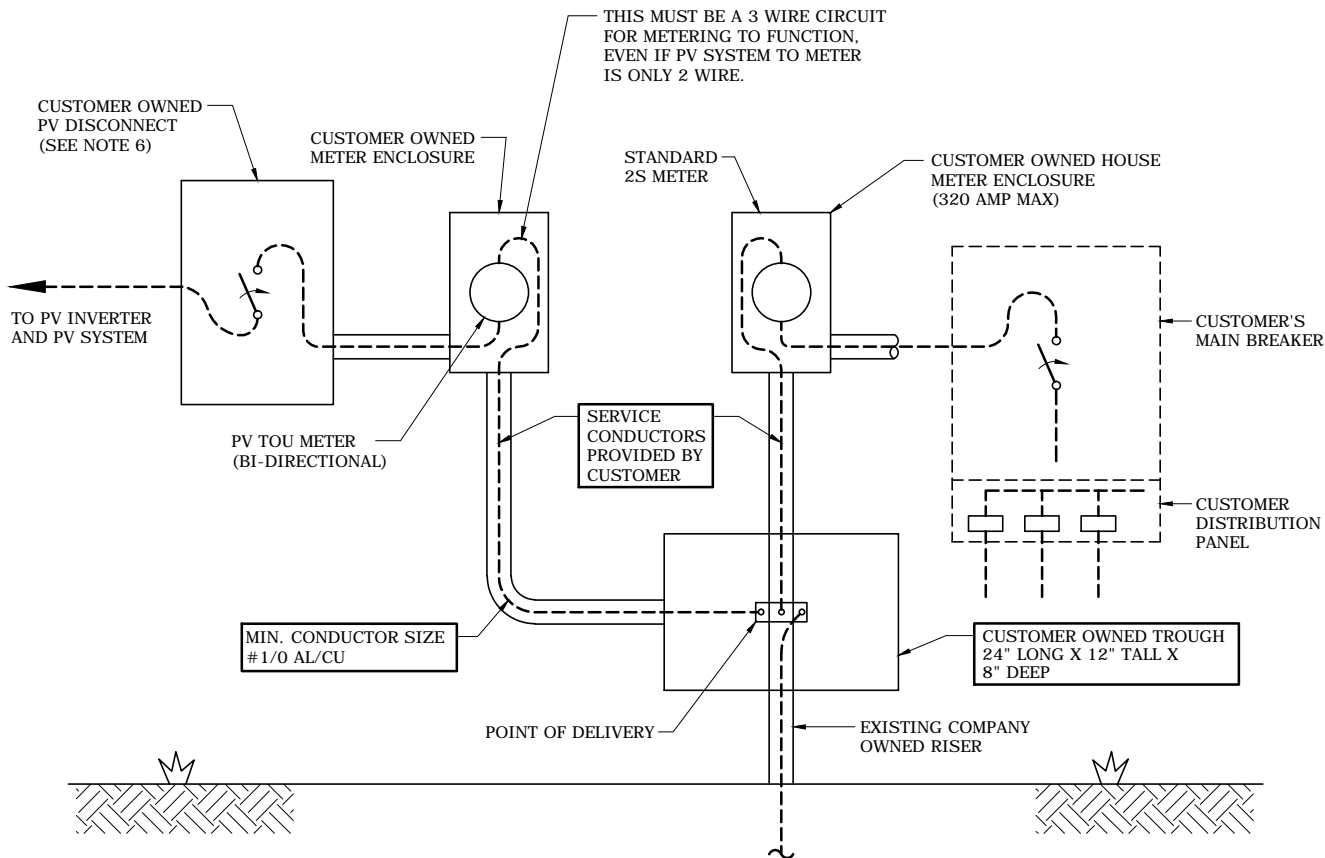
1. USE THIS WIRING METHOD FOR A SMALL POWER PRODUCER (USUALLY A PHOTOVOLTAIC SYSTEM) WHO SELLS ENTIRE OUTPUT OF GENERATION TO DUKE ENERGY.
2. PREFERRED CONFIGURATION FOR 200 AMP HOUSE SERVICE IS A 2-POSITION METER BASE AS SHOWN ABOVE. IF THE HOUSE SERVICE REQUIRES A 320 AMP METER, THEN A SEPARATE WIRING TROUGH AND TWO SEPARATE METER BASES ARE REQUIRED (SEE FIGURE 64). THE HOUSE METER BASE SHALL BE RATED 320 AMPS AND THE PHOTOVOLTAIC SYSTEM METER BASE SHALL BE RATED 200 AMPS. COMPANY TO CONNECT CONDUCTORS IN TROUGH USING CONNECTOR BLOCKS.
3. FOR SELL ALL METERS, METERING WILL INSTALL A BY-DIRECTIONAL METER.
4. ALL SMALL POWER PRODUCER INSTALLATIONS SHALL HAVE WARNING LABELS PLACED AT METER AND AT GENERATOR DISCONNECT.
5. CUSTOMER OWNED DISCONNECT MUST BE ADJACENT TO METER, LOAD-BREAK RATED, LOCKABLE IN OPEN POSITION AND PROVIDE A "VISIBLE OPENING".
6. FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE PV METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
7. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.



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0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION - SINGLE-PHASE  
SELF-CONTAINED PREFERRED CONFIGURATION SERVICE  
ADDING PV METER, SELF-CONTAINED  
NC AND SC

DEC	DEM	DEP	DEF
X		X	
FIG 63			



**NOTES:**

1. USE THIS WIRING METHOD FOR A SMALL POWER PRODUCER (USUALLY A PHOTOVOLTAIC SYSTEM) WHO SELLS ENTIRE OUTPUT OF GENERATION TO COMPANY.
2. FOR SELL ALL CONFIGURATIONS, A BI-DIRECTIONAL METER WILL BE INSTALLED.
3. ALL SMALL POWER PRODUCER INSTALLATIONS SHALL HAVE WARNING LABELS PLACED AT METER AND AT GENERATOR DISCONNECT.
4. CUSTOMER'S ELECTRICIAN MUST MAKE ARRANGEMENTS WITH COMPANY FOR A CLEARANCE ON EXISTING SERVICE, REMOVE COMPANY-OWNED RISER, INSTALL TROUGH AND RECONNECT RISER ABOVE AND BELOW TROUGH.
5. COMPANY TO CONNECT CONDUCTORS IN TROUGH USING CONNECTOR BLOCKS.
6. CUSTOMER OWNED DISCONNECT MUST BE ADJACENT TO METER, LOAD-BREAK RATED, LOCKABLE IN OPEN POSITION AND PROVIDE A "VISIBLE OPENING".
7. FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE PV METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
8. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.
9. PREFERRED CONFIGURATION FOR 200 AMP HOUSE SERVICE AND 200 AMP PV LOAD IS A 2-GANG METER ENCLOSURE AS SHOWN IN FIGURE 63, BUT CUSTOMER MAY USE THIS ALTERNATE CONFIGURATION AS AN OPTION. IF HOUSE SERVICE IS 320 AMP, THEN THIS ALTERNATE CONFIGURATION MUST BE UTILIZED FOR PV CONNECTION.
10. FOR VERY CONFINED SPACES (NO ROOM FOR TROUGH), CUSTOMER CAN INSTALL DOUBLE LUGS ON SOURCE SIDE OF METER ENCLOSURE (SIZE #4 - 500 KCMIL) FOR COMPANY CONDUCTORS AND SIZED TO FIT PV CONDUCTORS.

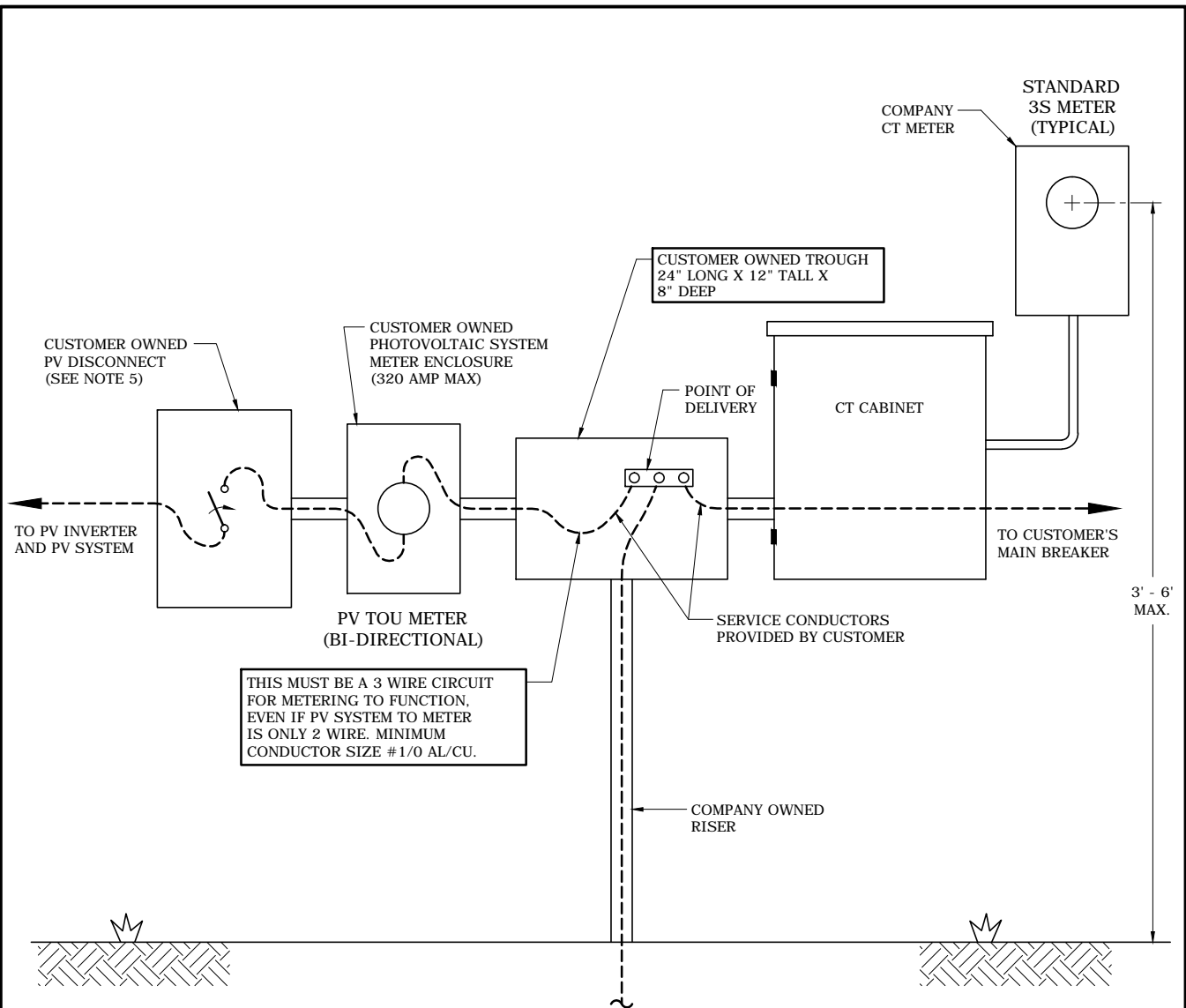


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0	2/1/16	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

**SELL ALL GENERATION - SINGLE-PHASE  
SELF-CONTAINED ALTERNATE CONFIGURATION SERVICE  
ADDING PV METER, SELF-CONTAINED  
NC AND SC**

DEC	DEM	DEP	DEF
X		X	

**FIG 64**



**NOTES:**

1. USE THIS WIRING METHOD FOR A SMALL POWER PRODUCER (USUALLY A PHOTOVOLTAIC SYSTEM) WHO SELLS ENTIRE OUTPUT OF GENERATION TO COMPANY.
2. COMPANY TO CONNECT CONDUCTORS IN TROUGH USING CONNECTOR BLOCKS SHOWN ON FIGURE 21.
3. FOR SELL ALL METERS, METERING WILL INSTALL A STANDARD METER PROGRAMMED FOR SGS-TOU WITH ALL DATA REGISTERED AS RECEIVED.
4. ALL SMALL POWER PRODUCER INSTALLATIONS SHALL HAVE WARNING LABELS PLACED AT METER AND AT GENERATOR DISCONNECT.
5. CUSTOMER OWNED DISCONNECT MUST BE ADJACENT TO METER, LOAD-BREAK RATED, LOCKABLE IN OPEN POSITION AND PROVIDE A "VISIBLE OPENING".
6. FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE PV METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
7. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.
8. FOR EXISTING UG T-RATED SERVICE, CUSTOMER'S ELECTRICIAN MUST MAKE ARRANGEMENTS WITH COMPANY FOR A CLEARANCE ON EXISTING SERVICE, REMOVE COMPANY SERVICE RISER, INSTALL TROUGH AND RISER TO CT CABINET. POD IN TROUGH.

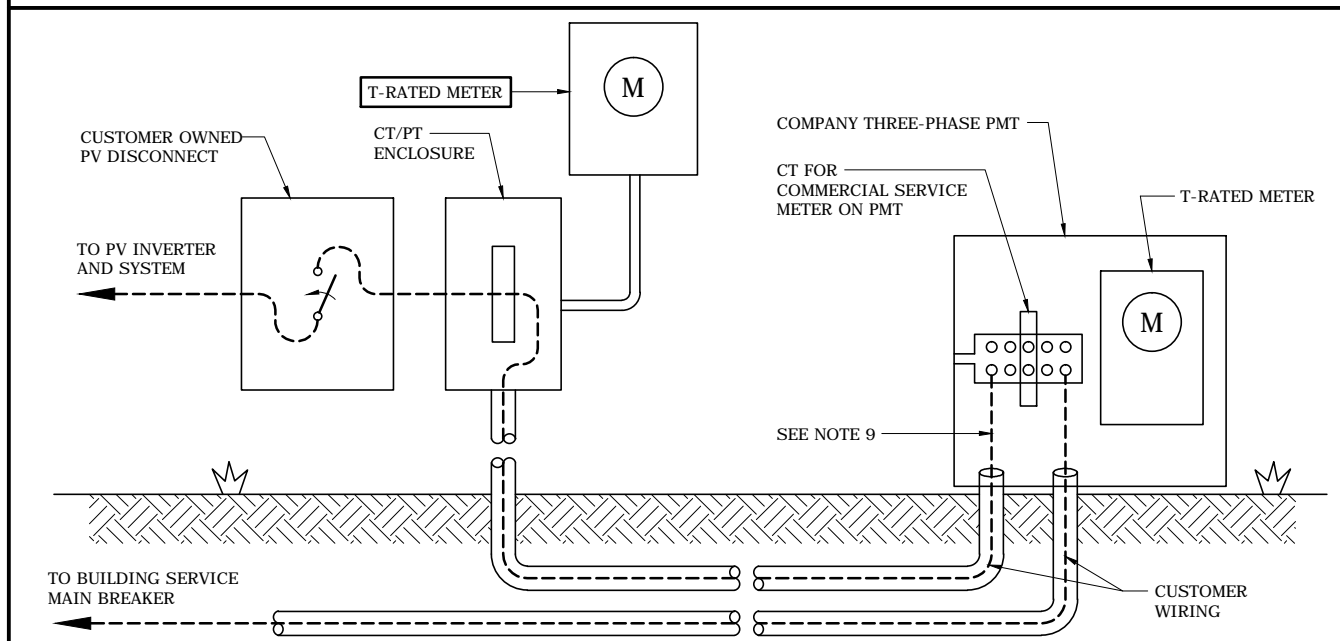
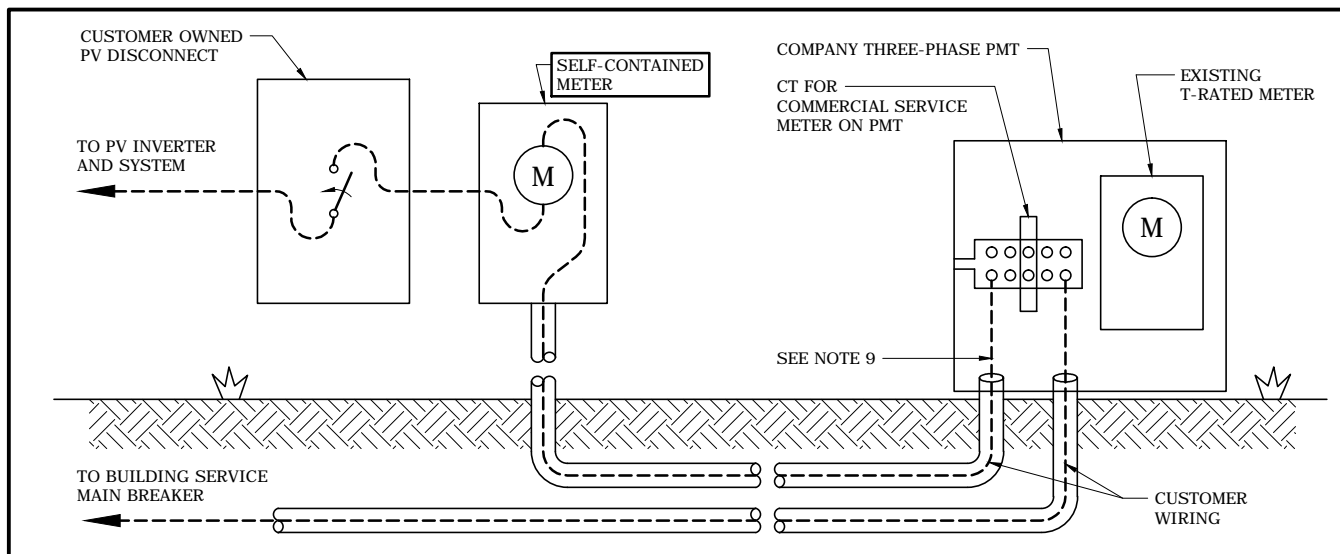
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0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION  
SINGLE-PHASE T-RATED SERVICE  
ADDING PV METER, SELF-CONTAINED  
NC AND SC



DEC	DEM	DEP	DEF
X		X	

**FIG 65**



#### NOTES:

1. CUSTOMER MAIN SERVICE IS METERED ON PMT. PV SERVICE IS METERED ON BUILDING AND WIRING PULLED TO PMT AND CONNECTED ON SOURCE SIDE OF C.T.'S IN PMT AS SHOWN.
2. TOTAL NUMBER OF CONDUCTORS (COMPANY AND CUSTOMER) CANNOT EXCEED THE NUMBER SHOWN IN [FIGURE 58](#).
3. MAXIMUM CUSTOMER CONDUCTOR SIZE IS 750 KCM AL/CU.
4. CUSTOMER CONDUCTORS MUST BE LABELED PER [FIGURE 28](#). METER ENCLOSURE MUST BE LABELED PER [FIGURE 3](#).
5. PV KVA CAPACITY CANNOT EXCEED KVA RATING OF PMT FOR T-RATED SERVICE OR 12KW FOR NETWORK SELF-CONTAINED METER. SEE [FIGURE 62](#) FOR ALLOWABLE PV LOADS AND METERING.
6. WARNING LABEL TO BE PLACE AT METER AND CUSTOMER DISCONNECT.
7. SINGLE LINE CONDUCTOR SHOWN FOR CLARITY.
8. CUSTOMER OWNED DISCONNECT MUST BE ADJACENT TO METER, LOAD-BREAK RATED, LOCKABLE IN OPEN POSITION AND PROVIDE A "VISIBLE OPENING". EXCEPTION: FOR FEEDER DISCONNECTS RATED  $\geq 1000$  AMPS AT 480Y/277 VOLTS, NO VISIBLE OPEN IS REQUIRED, BUT ALL OTHER PROVISIONS MUST BE MET.
9. FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE PV METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
10. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.
11. "SNAKING" OF CUSTOMER WIRING THRU EXISTING CT'S IS NOT ALLOWED.

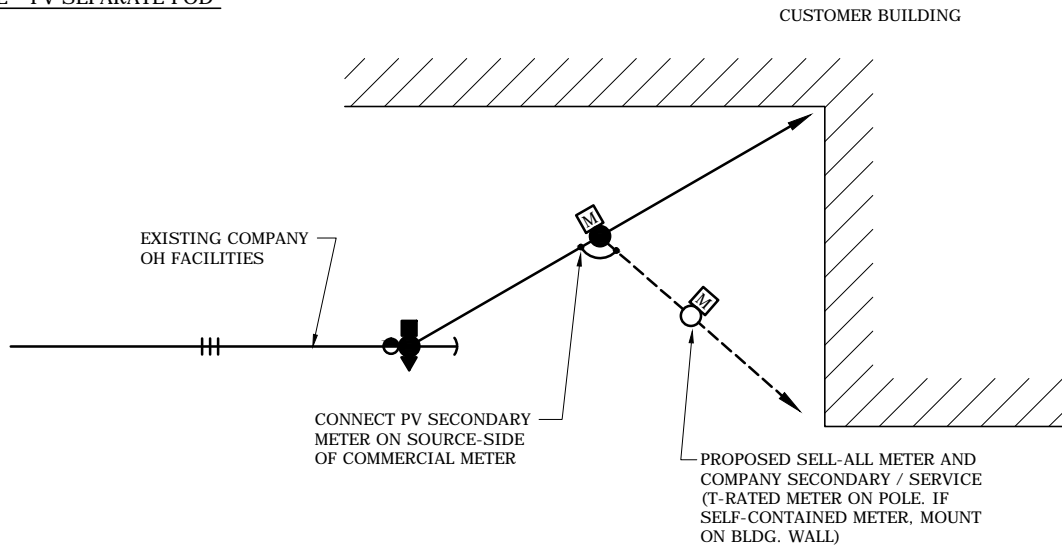


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0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

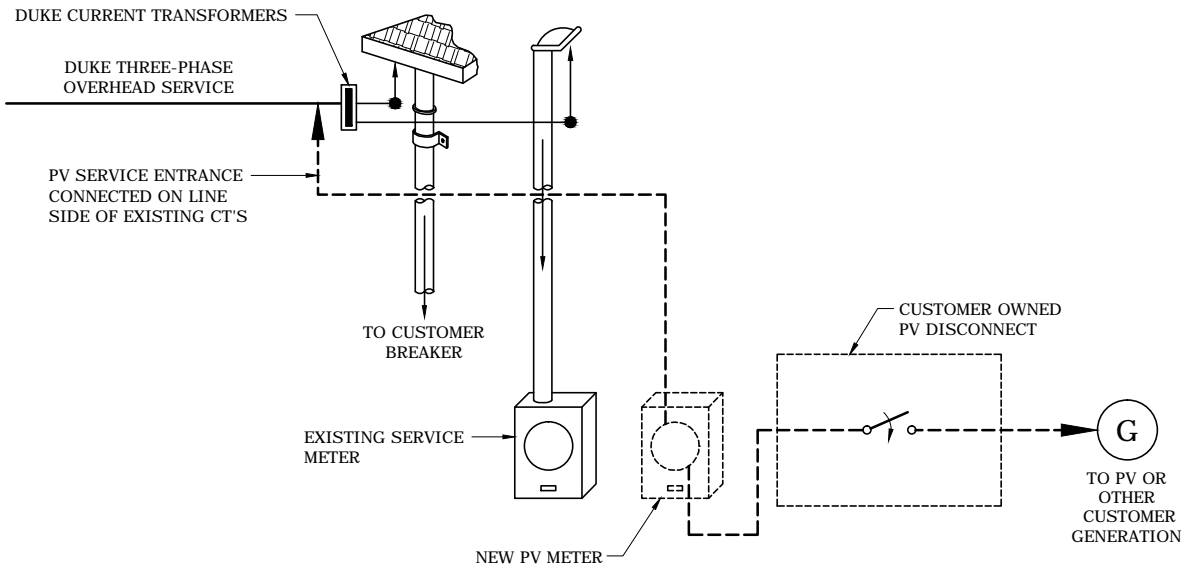
SELL ALL GENERATION  
THREE-PHASE LARGE T-RATED EXISTING UG SERVICE  
ADDING PV METER, T-RATED OR SELF-CONTAINED  
NC AND SC

DEC	DEM	DEP	DEF
X		X	
FIG 68A			

# OH SERVICE - PV SEPARATE POD



# OH SERVICE - PV RISER AT EXISTING RISER



## NOTES:

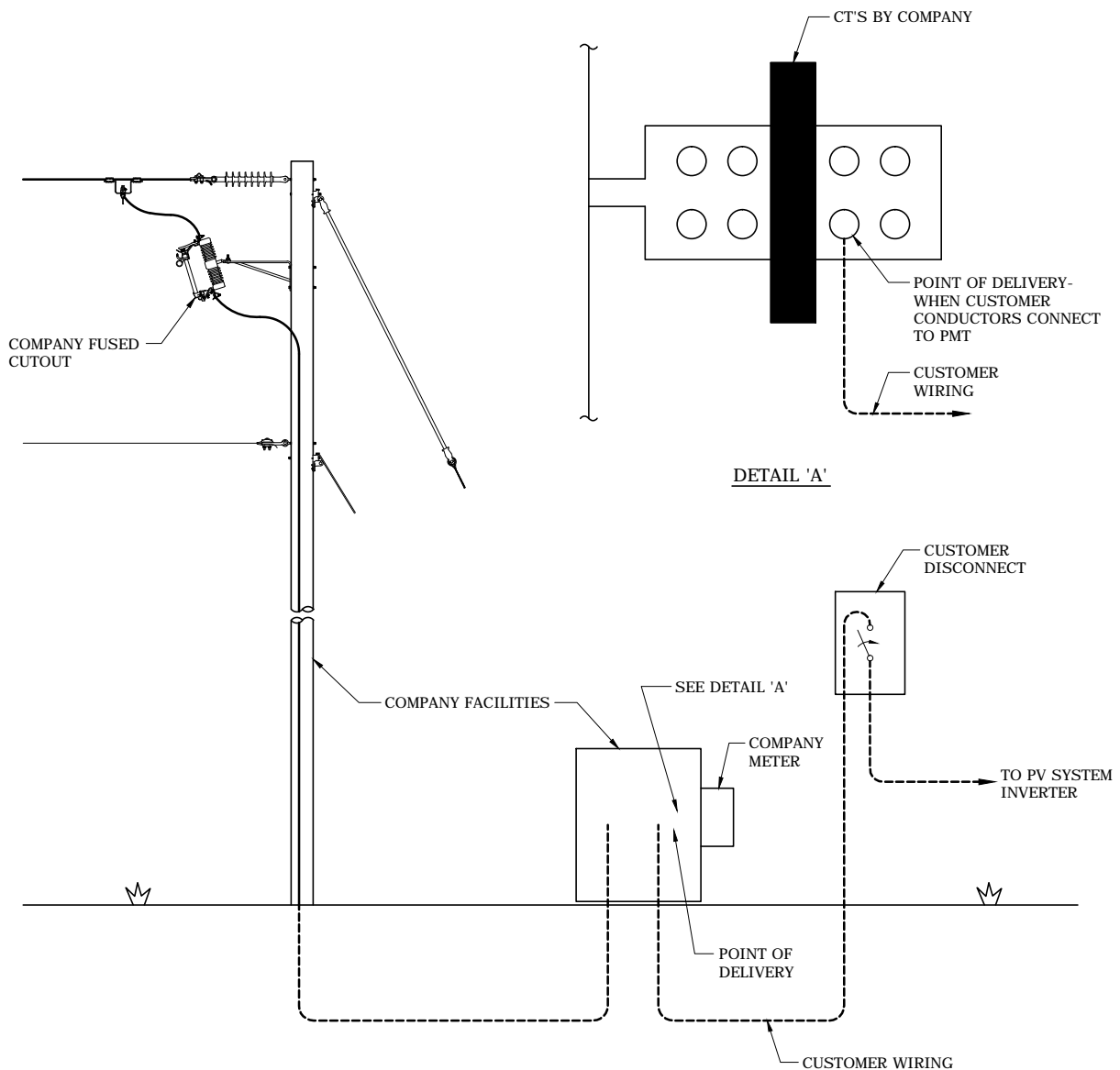
1. PV KVA CAPACITY CANNOT EXCEED KVA RATING OF OH BANK OR PLATFORM. REFER TO FIGURE 62 FOR METER VOLTAGE STANDARD AND DEMAND LIMITS.
2. WARNING LABELS TO BE PLACED AT METER, CUSTOMER DISCONNECT AND TRANSFORMER POLE.
3. SINGLE LINE CONDUCTOR SHOWN FOR CLARITY.
4. CUSTOMER-OWNED DISCONNECT MUST BE ADJACENT TO METER, READILY ACCESSIBLE TO COMPANY OPERATING PERSONNEL, LOAD-BREAK RATED, LOCKABLE IN THE OPEN POSITION AND PROVIDE A "VISIBLE OPENING". FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE PV METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.
5. IF GENERATOR IS BEING ADDED WITHIN A SERVICE THAT UTILIZES SUBSTATION-STYLE TRANSFORMERS, CONTACT DISTRIBUTION STANDARDS FOR GUIDANCE ON CONNECTION.
6. SERVICE LATERAL CLEARANCE MUST MEET FIG. 11 REQUIREMENTS.



3				
2				
1				
0	11/20/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION  
THREE-PHASE LARGE T-RATED EXISTING OH SERVICE  
ADDING PV METER, T-RATED OR SELF-CONTAINED  
NC AND SC

DEC	DEM	DEP	DEF
X		X	
FIG 68B			



**NOTES:**

1. THIS SERVICE ARRANGEMENT IS USED TO CONNECT TO A LARGE STANDALONE POWER PRODUCING SYSTEM WHERE COMPANY PROVIDES TRANSFORMATION.
2. WARNING LABEL TO BE PLACED AT METER AND CUSTOMER DISCONNECT.
3. CUSTOMER OWNED DISCONNECT MUST BE ADJACENT TO METER, LOAD-BREAK RATED, LOCKABLE IN OPEN POSITION AND PROVIDE A "VISIBLE OPENING". EXCEPTION: FOR FEEDER DISCONNECTS RATED  $\geq 1000$  AMPS AT 480Y/277 VOLTS, NO VISIBLE OPEN IS REQUIRED, BUT ALL OTHER PROVISIONS MUST BE MET.
4. FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE PV METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
5. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.
6. TOTAL CUSTOMER CONDUCTORS CANNOT EXCEED THAT SHOWN IN FIGURE 58.
7. MAXIMUM CUSTOMER CONDUCTOR SIZE IS 750 KCMIL AL/CU.
8. SINGLE LINE DIAGRAM SHOWN FOR CLARITY.

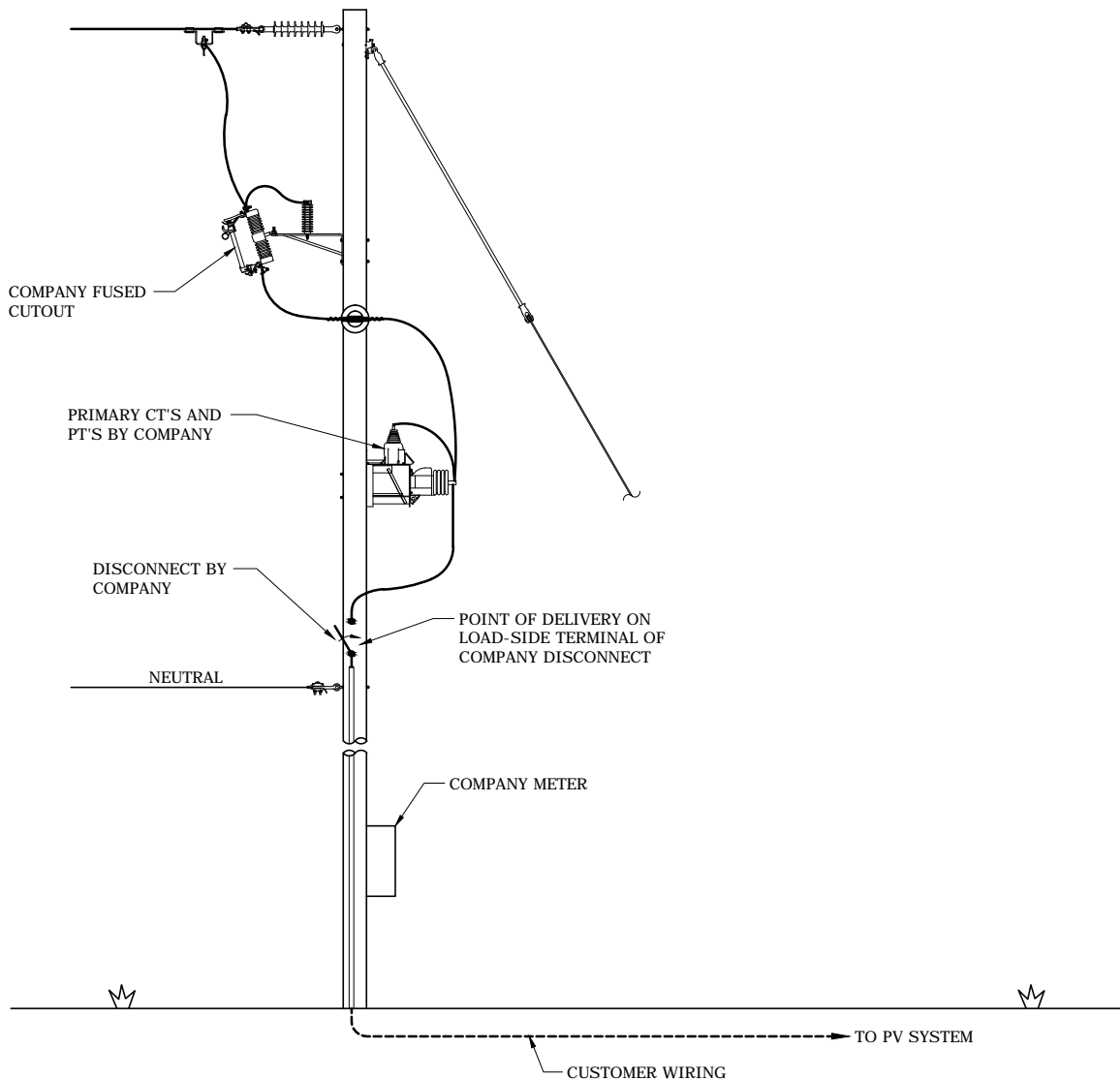
3				
2				
1				
0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION  
 STANDALONE SYSTEM  
 THREE-PHASE SECONDARY METERING  
 NC AND SC



DEC	DEM	DEP	DEF
X		X	

**FIG 69**



**NOTES:**

1. THIS SERVICE ARRANGEMENT IS USED TO CONNECT TO A LARGE IPP STANDALONE SYSTEM WHERE COMPANY PROVIDES FUSING FOR PROTECTION. CUSTOMER RECEIVES PRIMARY VOLTAGE AND PROVIDES THEIR OWN TRANSFORMATION AND UG FACILITIES.
2. WARNING LABEL TO BE PLACED AT METER ON POLE ADVISING OF CUSTOMER GENERATION ON SITE.
3. CUSTOMER PROVIDES ALL WIRING AND TRANSFORMATION BEYOND LOAD SIDE TERMINALS OF COMPANY DISCONNECT.
4. SINGLE LINE DIAGRAM SHOWN FOR CLARITY.
5. COMPANY PROVIDES ALL FACILITIES TO P.O.D.

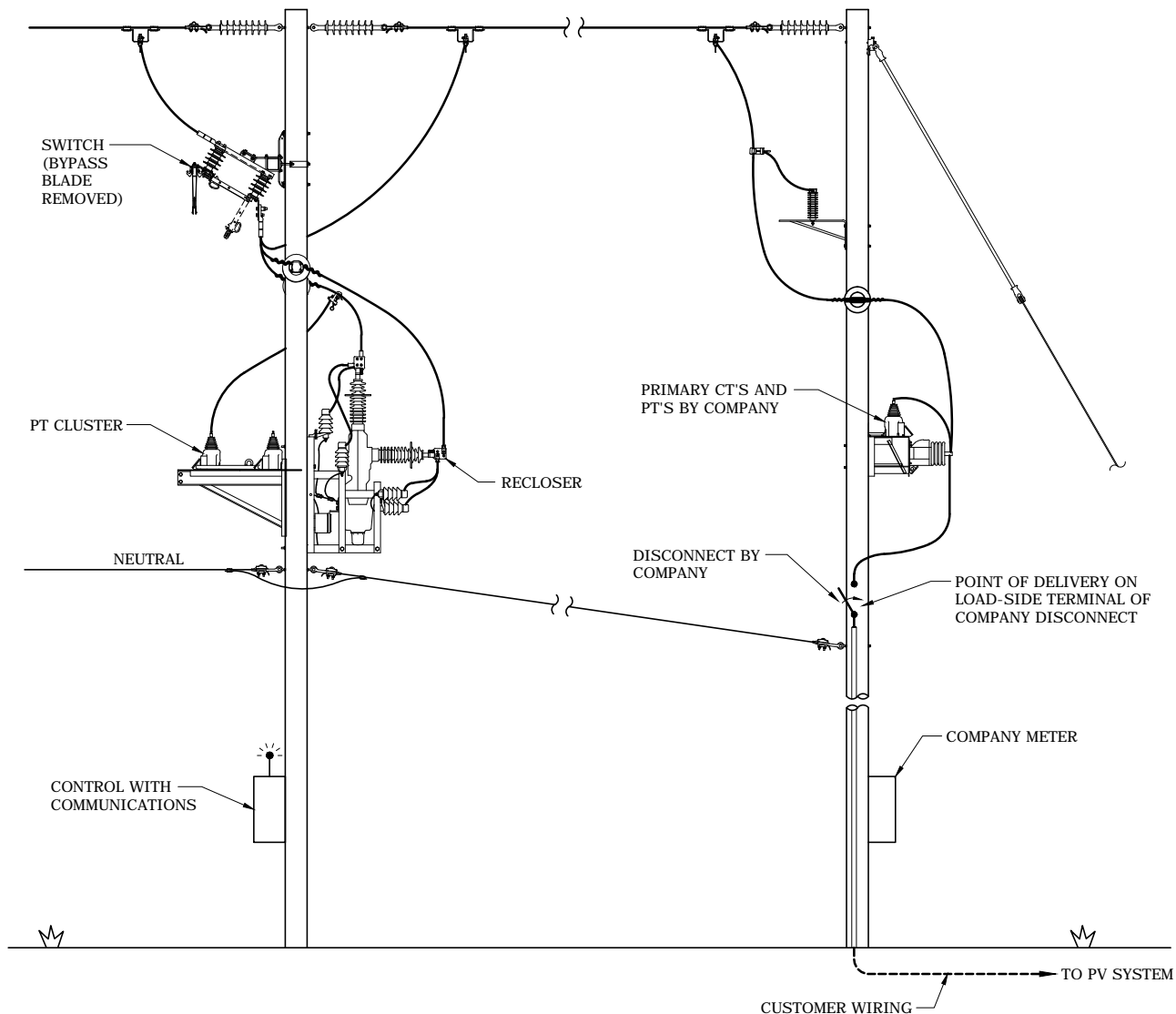


3				
2				
1				
0	10/28/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION  
THREE-PHASE PRIMARY METERING  
FUSED IPP INSTALLATION, CUSTOMER UG DIP

DEC	DEM	DEP	DEF
		X	
FIG 70A			





**NOTES:**

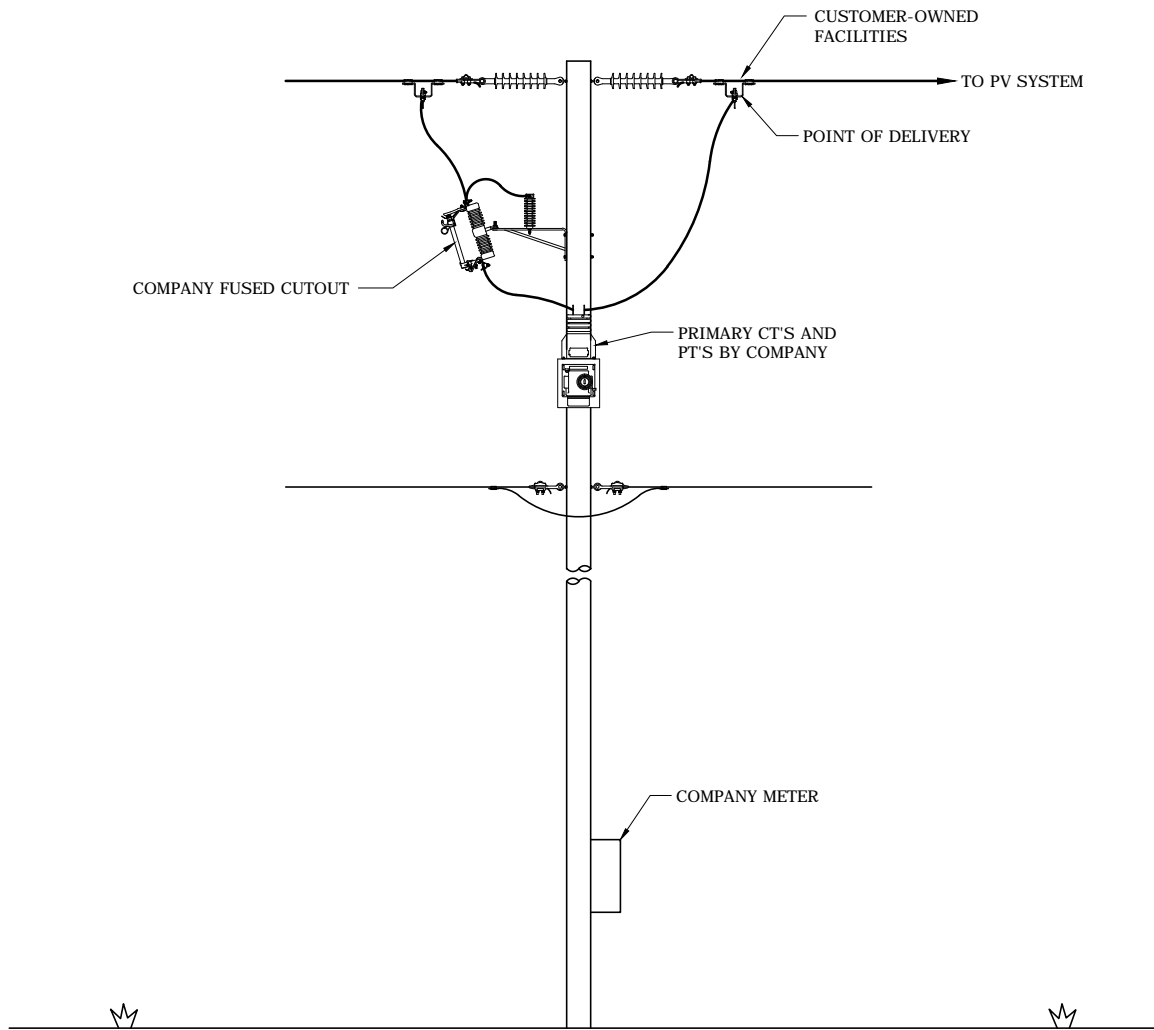
- 1. THIS SERVICE ARRANGEMENT IS USED TO CONNECT TO A LARGE IPP STANDALONE SYSTEM WHERE COMPANY PROVIDES A RECLOSER FOR PROTECTION. CUSTOMER RECEIVES PRIMARY VOLTAGE AND PROVIDES THEIR OWN TRANSFORMATION AND UG FACILITIES. RECLOSER SHALL BE LOCATED ON THE PROPERTY OF THE IPP OR AT A PRE-APPROVED LOCATION THAT MINIMIZES POTENTIAL IMPACTS TO OTHER CUSTOMERS.
2. WARNING LABEL TO BE PLACED AT METER ON POLE ADVISING OF CUSTOMER GENERATION ON SITE.
3. CUSTOMER PROVIDES ALL WIRING AND TRANSFORMATION BEYOND LOAD SIDE TERMINALS OF COMPANY DISCONNECT.
- 4. SINGLE LINE DIAGRAM SHOWN FOR CLARITY. THIS DRAWING IS A GENERIC REPRESENTATION OF THE DUKE ENERGY PROTECTIVE AND METERING PACKAGE FOR GENERATION SITES. ACTUAL METERING/RECLOSER LOCATIONS AND USE OF SPECIFIC SUBCOMPONENTS MAY VARY BY REGION (EX. DEC HAS PRIMARY METERING ON UTILITY SIDE OF RECLOSER, DEP HAS PRIMARY METERING ON IPP SIDE OF RECLOSER).
5. COMPANY PROVIDES ALL FACILITIES TO P.O.D.
- 6. ALL BYPASS BLADES WILL BE REMOVED FOLLOWING THE COMMISSIONING OF THE RECLOSER AT THESE IPP SITES.



3				
2				
1	8/2/16	EANES	EANES	ADCOCK
0	10/28/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION (GENERAL REPRESENTATION)  
THREE-PHASE PRIMARY METERING  
IPP RECLOSER INSTALLATION - CUSTOMER UG DIP

DEC	DEM	DEP	DEF
X		X	
FIG 70B			



**NOTES:**

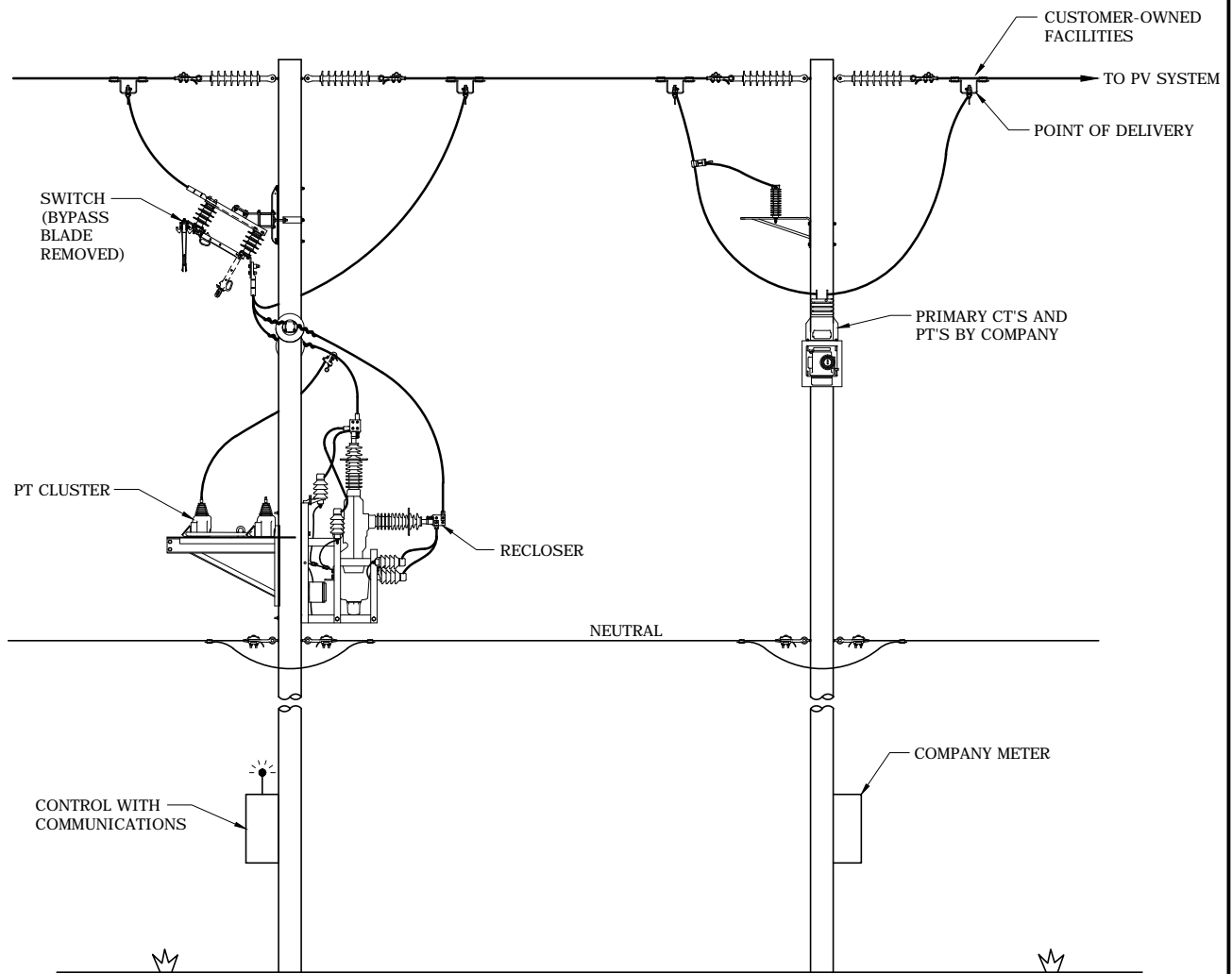
1. THIS SERVICE ARRANGEMENT IS USED TO CONNECT TO A LARGE IPP STANDALONE SYSTEM WHEN COMPANY PROVIDES FUSING FOR PROTECTION. CUSTOMER RECEIVES PRIMARY VOLTAGE AND PROVIDES THEIR OWN TRANSFORMATION AND OH FACILITIES.
2. WARNING LABEL TO BE PLACED AT METER ON POLE ADVISING OF CUSTOMER GENERATION ON SITE.
3. CUSTOMER PROVIDES ALL WIRING, DISCONNECTS AND TRANSFORMATION BEYOND POINT OF DELIVERY.
4. SINGLE LINE DIAGRAM SHOWN FOR CLARITY.
5. COMPANY PROVIDES ALL FACILITIES TO P.O.D.



3				
2				
1				
0	10/28/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION  
 THREE-PHASE PRIMARY METERING  
 FUSED IPP INSTALLATION - CUSTOMER OH CONNECTION

DEC	DEM	DEP	DEF
		X	
FIG 71A			



**NOTES:**

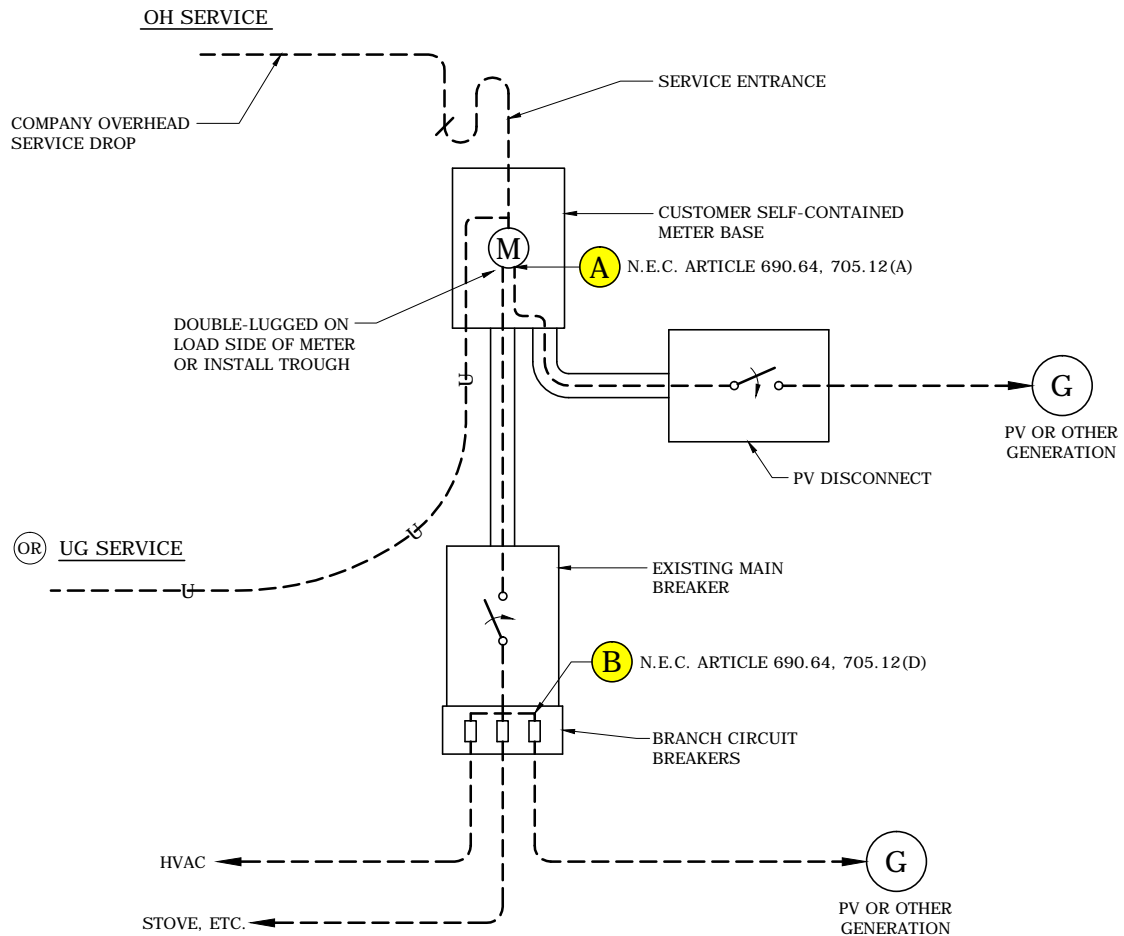
- 1. THIS SERVICE ARRANGEMENT IS USED TO CONNECT TO A LARGE IPP STANDALONE SYSTEM WHERE COMPANY PROVIDES A RECLOSER FOR PROTECTION. CUSTOMER RECEIVES PRIMARY VOLTAGE AND PROVIDES THEIR OWN TRANSFORMATION AND OH FACILITIES. RECLOSER SHALL BE LOCATED ON THE PROPERTY OF THE IPP OR AT A PRE-APPROVED LOCATION THAT MINIMIZES POTENTIAL IMPACTS TO OTHER CUSTOMERS.
2. WARNING LABEL TO BE PLACED AT METER ON POLE ADVISING OF CUSTOMER GENERATION ON SITE.
3. CUSTOMER PROVIDES ALL WIRING, DISCONNECTS AND TRANSFORMATION BEYOND POINT OF DELIVERY.
- 4. SINGLE LINE DIAGRAM SHOWN FOR CLARITY. THIS DRAWING IS A GENERIC REPRESENTATION OF THE DUKE ENERGY PROTECTIVE AND METERING PACKAGE FOR GENERATION SITES. ACTUAL METERING/RECLOSER LOCATIONS AND USE OF SPECIFIC SUBCOMPONENTS MAY VARY BY REGION (EX. DEC HAS PRIMARY METERING ON UTILITY SIDE OF RECLOSER, DEP HAS PRIMARY METERING ON IPP SIDE OF RECLOSER).
5. COMPANY PROVIDES ALL FACILITIES TO P.O.D.
- 6. ALL BYPASS BLADES WILL BE REMOVED FOLLOWING THE COMMISSIONING OF THE RECLOSER AT THESE IPP SITES.



3				
2				
1	8/2/16	EANES	EANES	ADCOCK
0	10/28/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

SELL ALL GENERATION (GENERAL REPRESENTATION)  
THREE-PHASE PRIMARY METERING  
IPP RECLOSER INSTALLATION - CUSTOMER OH CONNECTION

DEC	DEM	DEP	DEF
X		X	
FIG 71B			



**NOTES:**

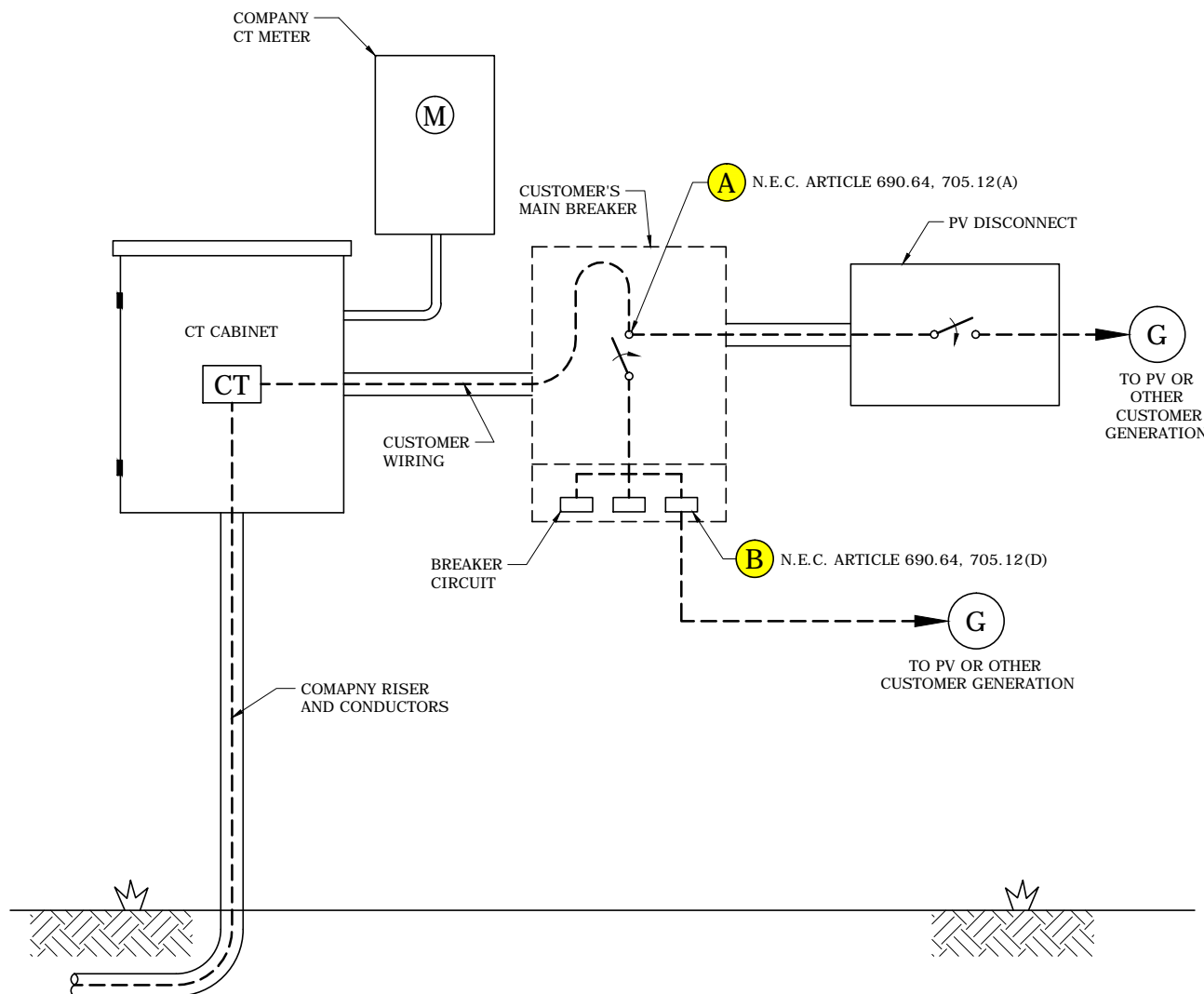
1. GENERATION DISCONNECT CAN BE CONNECTED AT EITHER (A) OR (B) PER N.E.C. ARTICLE 690.64, 705.12(A) OR (D).
2. PV GENERATION DISCONNECT POSITION (A) REQUIREMENTS: MUST BE LOAD-BREAK RATED, LOCKABLE OPEN POSITION, PROVIDE VISIBLE OPEN AND LOCATED ADJACENT TO METER.
3. FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
4. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.
5. PV GENERATION DISCONNECT POSITION (B) REQUIREMENTS: MUST BE LOAD-BREAK RATED AND LOCKABLE OPEN PROVISION.
6. EXISTING METER MUST BE REPLACED WITH BI-DIRECTIONAL METER (SEE FIGURE 62).
7. WARNING LABEL MUST BE PLACED AT METER AND GENERATOR DISCONNECT.
8. CUSTOMER ELECTRICIAN TO REPLACE EXISTING LOAD SIDE METER LUGS WITH A DOUBLE-LUGGED CONNECTOR TO ACCEPT WIRING. IF CORRECT CONNECTORS ARE NOT AVAILABLE, A TROUGH MUST BE INSTALLED BELOW METER BASE.



3				
2				
1				
0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

"NET" GENERATION METERING SINGLE OR  
THREE-PHASE SELF-CONTAINED METERED SERVICE  
RESIDENTIAL/ SMALL COMMERCIAL  
OH OR UG SERVICE - NC ONLY

DEC	DEM	DEP	DEF
X		X	
FIG 72A			



**NOTES:**

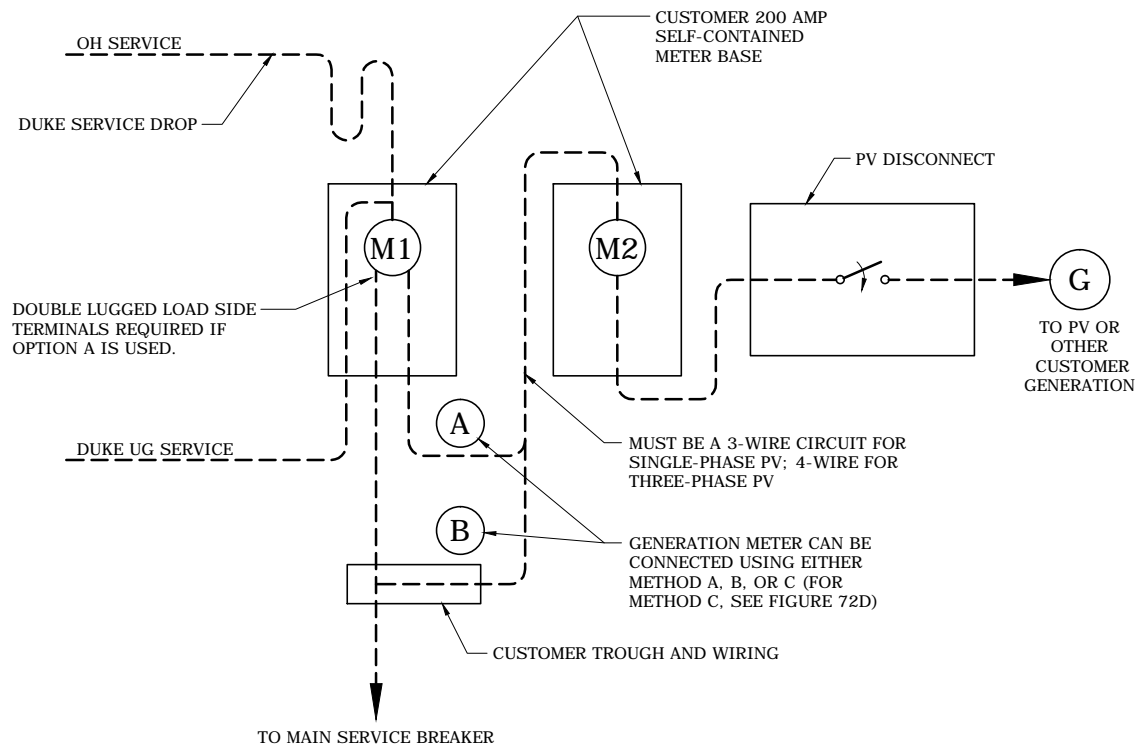
1. GENERATION DISCONNECT CAN BE CONNECTED AT EITHER (A) OR (B) PER N.E.C. ARTICLE 690.64, 705.12(A) OR (D).
2. PV GENERATION DISCONNECT POSITION (A) REQUIREMENTS: MUST BE LOAD-BREAK RATED, LOCKABLE OPEN POSITION, PROVIDE VISIBLE OPEN AND LOCATED ADJACENT TO METER.
3. FOR DEP, PV DISCONNECT FOR LOADS LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
4. FOR DEC, PV DISCONNECT REQUIRED FOR ALL LOADS AND MUST BE ADJACENT TO METER.
5. PV GENERATION DISCONNECT POSITION (B) REQUIREMENTS: MUST BE LOAD-BREAK RATED AND LOCKABLE OPEN PROVISION.
6. EXISTING METER MUST BE REPLACED WITH BI-DIRECTIONAL METER. SEE FIGURE 62.
7. WARNING LABEL MUST BE PLACED AT METER AND GENERATOR DISCONNECT.
8. FOR CONNECTION (A), CUSTOMER ELECTRICIAN TO REPLACE EXISTING SOURCE SIDE CONNECTORS ON CUSTOMER MAIN BREAKER WITH A DOUBLE-LUGGED CONNECTOR TO ACCEPT WIRING. IF CORRECT CONNECTORS ARE NOT AVAILABLE, A TROUGH MUST BE INSTALLED ON SOURCE SIDE OF CUSTOMER MAIN BREAKER AND PV DISCONNECT.



3				
2				
1				
0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

"NET" GENERATION METERING  
SINGLE OR THREE-PHASE C.T. METERED SERVICE  
RESIDENTIAL/SMALL COMMERCIAL  
UG SERVICE - NC ONLY

DEC	DEM	DEP	DEF
X		X	
FIG 72B			



**M1** SERVICE METER - EXISTING METER MUST BE REPLACED WITH A BI-DIRECTIONAL METER.

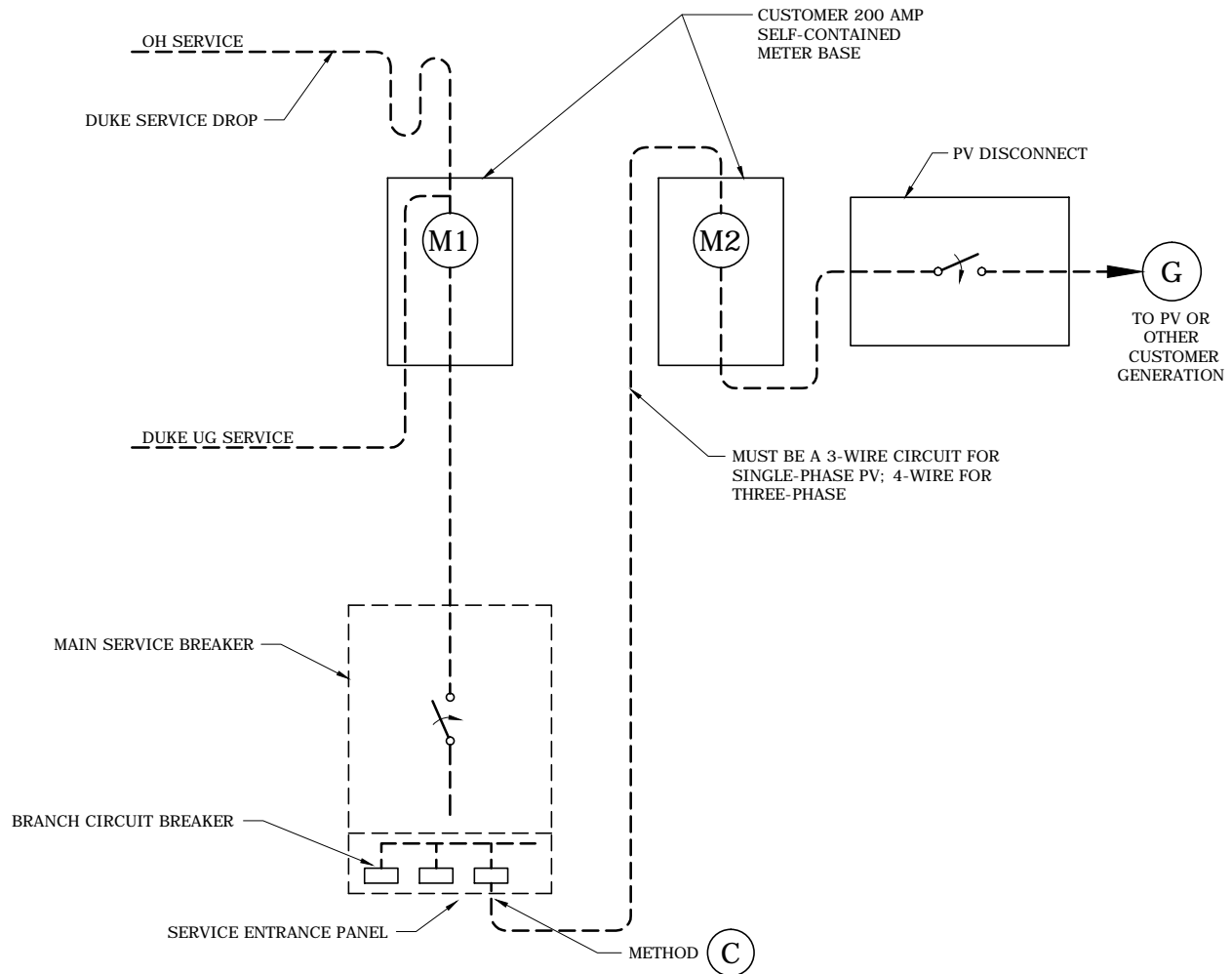
**M2** GENERATION METER - MUST BE INSTALLED ADJACENT TO SERVICE METER AND MUST BE BI-DIRECTIONAL.

#### NOTES:

1. GENERATION CAN BE CONNECTED USING METHOD A OR B SHOWN OR METHOD C SHOWN ON FIGURE 72D. FOR METHOD A, CUSTOMER ELECTRICIAN MUST REPLACE EXISTING LOAD SIDE METER BASE LUGS WITH DOUBLE LUG CONNECTOR. IF METHOD B IS USED, THE TROUGH MUST BE INSTALLED BELOW THE EXISTING METER BASE.
2. FOR DEC, PV DISCONNECT MUST BE ACCESSIBLE TO COMPANY PERSONNEL, LOAD-BREAK RATED, LOCKABLE IN THE OPEN POSITION, PROVIDE A VISIBLE OPEN, AND LOCATED ADJACENT TO SERVICE METER.
3. FOR DEP, PV DISCONNECT MUST BE ACCESSIBLE TO COMPANY PERSONNEL, LOAD-BREAK RATED, LOCKABLE IN THE OPEN POSITION, PROVIDE A VISIBLE OPEN, AND LOCATED ADJACENT TO SERVICE METER. FOR PV LOADS  $\leq 10\text{KW}$ , THE PV DISCONNECT CAN BE LOCATED OTHER THAN ADJACENT TO THE SERVICE METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.
4. REQUIRED WARNING LABELS MUST BE PLACED AT SERVICE METER AND DISCONNECT.
5. THE CUSTOMER'S WIRING AND ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE ADOPTED EDITION OF THE N.E.C. AND LOCAL ORDINANCES.



3					"NET" GENERATION METERING SINGLE OR THREE-PHASE SELF-CONTAINED METERED SERVICE RESIDENTIAL/ SMALL COMMERCIAL OH OR UG SERVICE <u>SC ONLY</u> - METHODS A AND B	DEC	DEM	DEP	DEF
2						X		X	
1									
0	1/13/16	SIMPSON	MEDLIN	CHANDLER					
REVISED	BY	CK'D	APPR.			FIG 72C			



**M1** SERVICE METER - EXISTING METER MUST BE REPLACED WITH A BI-DIRECTIONAL METER.

**M2** GENERATION METER - MUST BE INSTALLED ADJACENT TO SERVICE METER AND MUST BE BI-DIRECTIONAL.

#### NOTES:

1. FOR DEC: THE PV DISCONNECT MUST BE ACCESSIBLE TO COMPANY PERSONNEL, LOAD-BREAK RATED LOCKABLE IN THE OPEN POSITION PROVIDING A VISIBLE OPEN, AND LOCATED ADJACENT TO THE SERVICE METER.

FOR DEP: THE BRANCH CIRCUIT BREAKER MUST BE LOAD-BREAK RATED AND LOCKABLE OPEN. PV DISCONNECT FOR LOAD  $\leq 10$  KW CAN BE LOCATED OTHER THAN ADJACENT TO THE METER AS LONG AS N.E.C. ARTICLE 230.71 AND 72 ARE MET.

2. REQUIRED WARNING LABELS MUST BE PLACED AT SERVICE METER AND DISCONNECT.

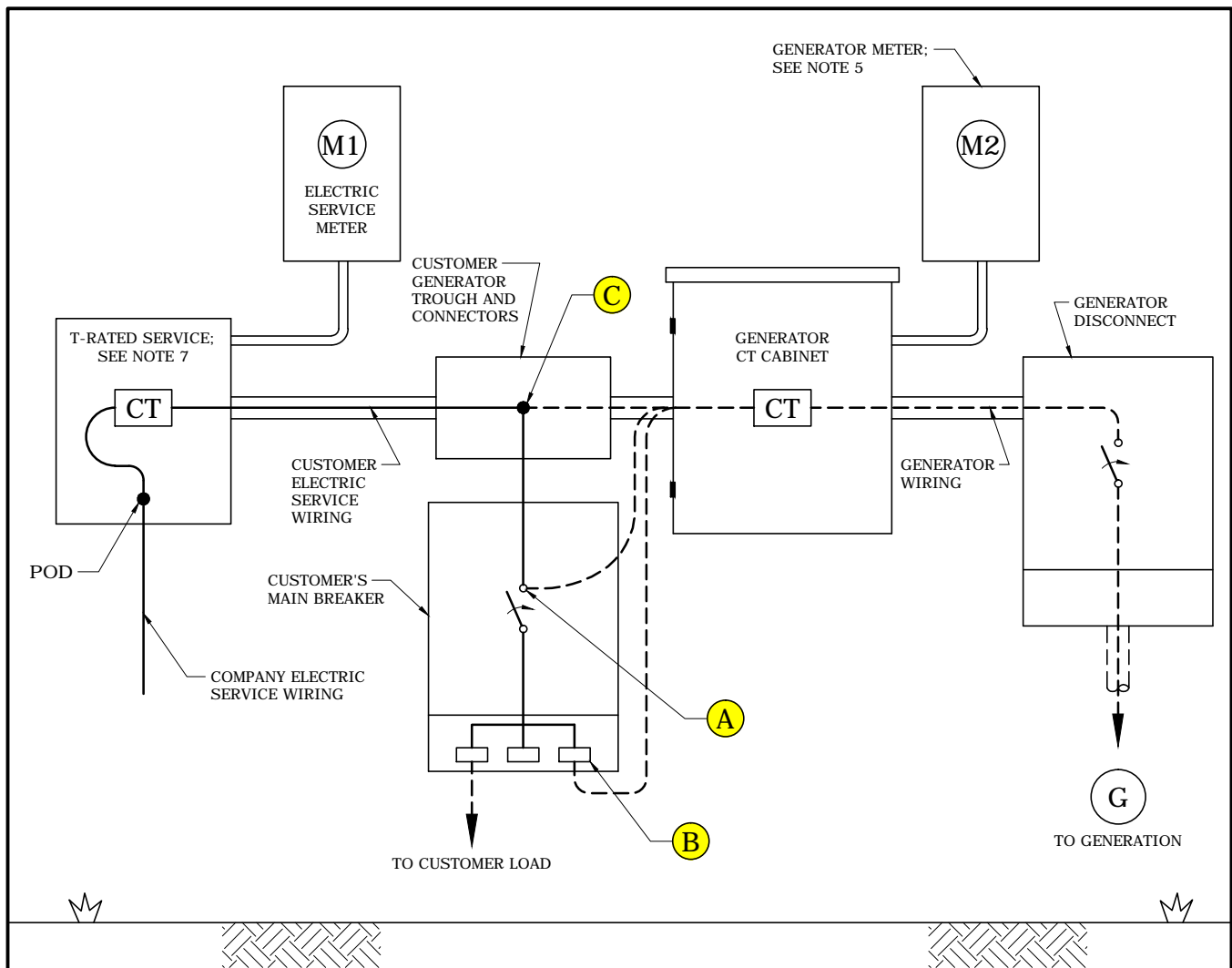
3. THE CUSTOMER'S WIRING AND ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE ADOPTED EDITION OF THE N.E.C. AND LOCAL ORDINANCES.



3				
2				
1				
0	10/28/15	SIMPSON	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

"NET" GENERATION METERING SINGLE OR THREE-PHASE  
SELF-CONTAINED METERED SERVICE  
RESIDENTIAL/ SMALL COMMERCIAL OH OR UG SERVICE  
SC ONLY - METHOD C

DEC	DEM	DEP	DEF
X		X	
FIG 72D			



**NOTES:**

1. GENERATOR DISCONNECT CAN BE CONNECTED AT EITHER (A), (B), OR (C).
2. GENERATOR DISCONNECT, LOAD-BREAK RATED, LOCKABLE OPEN. PROVIDE VISIBLE OPEN AND LOCATE ADJACENT TO GENERATOR CT CABINET.
3. BOTH COMPANY METERS MUST BE BI-DIRECTIONAL.
4. DUKE WILL PLACE GENERATION WARNING LABELS AT BOTH METERS AND GENERATOR DISCONNECTS.
5. DUKE PROVIDES AND INSTALLS GENERATOR METER AND ENCLOSURE. DUKE PROVIDES GENERATOR CT'S.
6. GENERATOR CT CABINET REQUIRED WHEN GENERATOR PROTECTIVE DEVICE IS GREATER THAN 400 AMPS. LOCATE ADJACENT TO ELECTRIC SERVICE METER.
7. COMPANY ELECTRIC SERVICE CT'S MAY BE IN A PADMOUNT TRANSFORMER, CT CABINET MOUNTED ON THE BUILDING, A MAST, OR UTILITY POLE. (NOTE: DEP: PROVIDES CT CABINET; SEE FIGURE 43B. DEC: CUSTOMER PROVIDES CABINET; SEE FIGURE 43A.) FOR INSTANCES WHERE SERVICE IS PROVIDED BY A PADMOUNT TRANSFORMER, THE GENERATOR WIRING MAY BE CONNECTED WITHIN THE SECONDARY COMPARTMENT OF THE TRANSFORMER ONLY IF THERE IS ADEQUATE SPACE AVAILABLE ON THE TRANSFORMER SPADES AND THE CRITERIA PER FIGURE 58 IS NOT EXCEEDED. THIS EXCEPTION MUST BE VERIFIED IN THE FIELD PRIOR TO ANY FINAL DESIGN APPROVAL.

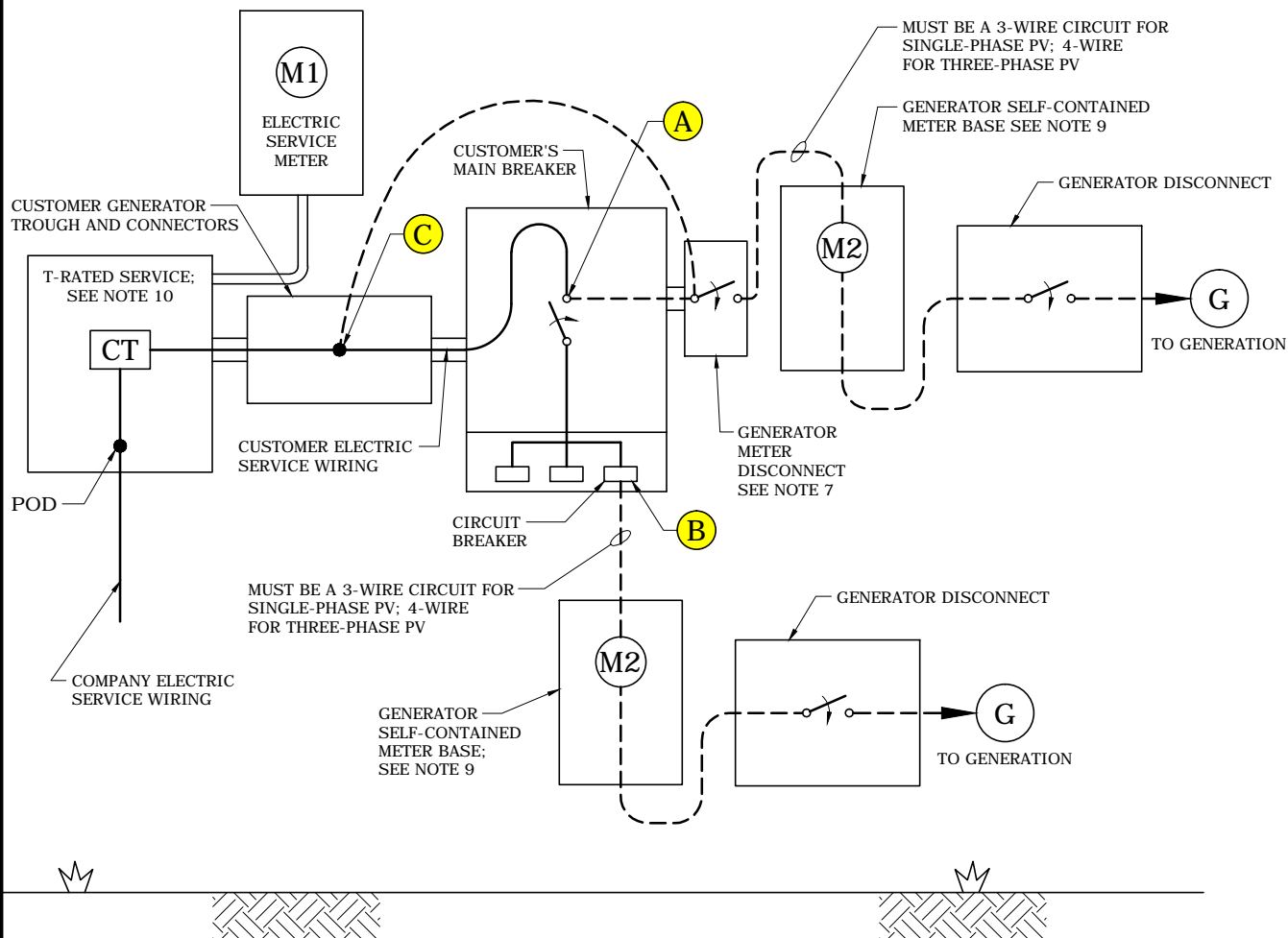


3				
2				
1				
0	8/3/16	ARCHER	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

**"NET METERING" GENERATION  
 WITH CT METERED ELECTRIC SERVICE  
 WITH GENERATOR DISCONNECT RATED > 400 AMPS  
 SOUTH CAROLINA ONLY**

DEC	DEM	DEP	DEF
X		X	
<b>FIG 72E</b>			





#### NOTES:

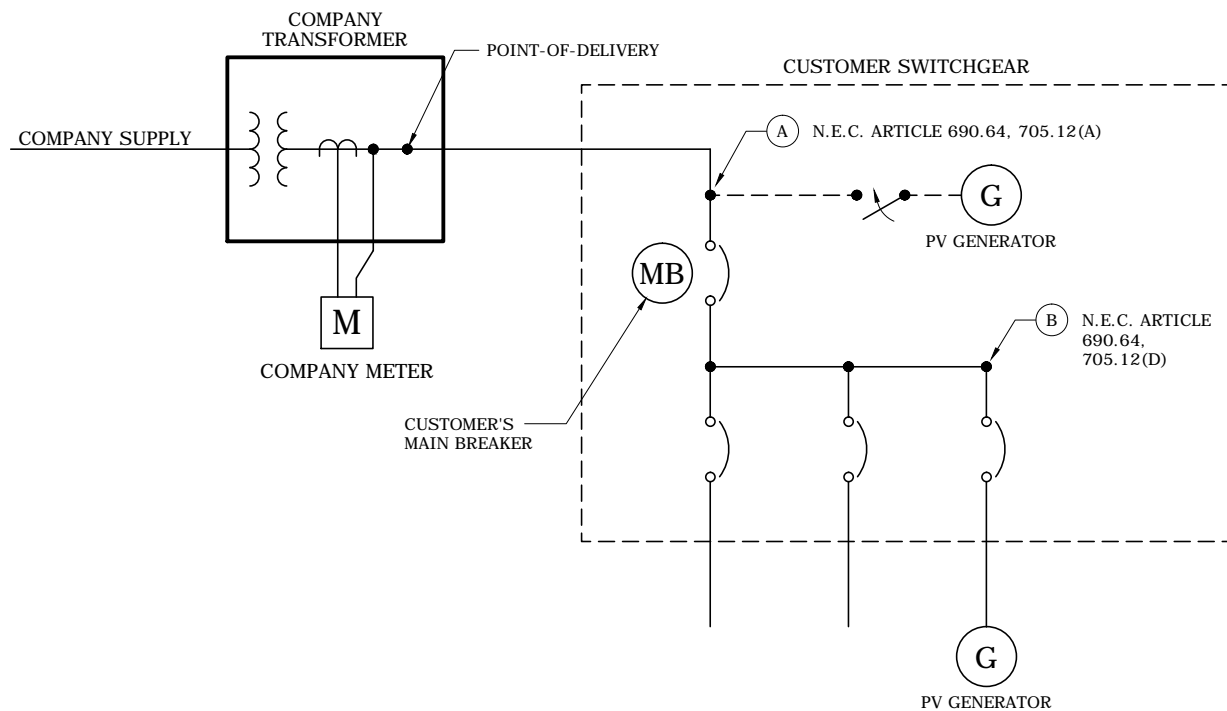
1. GENERATOR DISCONNECT CAN BE CONNECTED AT EITHER (A), (B), OR (C).
2. GENERATOR DISCONNECT REQUIREMENTS: MUST BE LOAD-BREAK RATED, LOCKABLE OPEN POSITION, PROVIDE VISIBLE OPEN AND LOCATED ADJACENT TO ELECTRIC SERVICE METER.
3. FOR DEP ONLY, DISCONNECT FOR GENERATION LESS THAN OR EQUAL TO 10KW CAN BE LOCATED OTHER THAN ADJACENT TO THE ELECTRIC SERVICE METER AS LONG AS N.E.C. GUIDELINES ARE MET.
4. FOR OPTION (B), IF VOLTAGE IS 480/277, CIRCUIT BREAKER MUST BE LOAD-BREAK RATED AND LOCKABLE OPEN PROVISION OR MAY INSERT GENERATION METER DISCONNECT BETWEEN BREAKER AND GENERATOR METER.
5. BOTH METERS MUST BE BI-DIRECTIONAL METER.
6. DUKE WILL PLACE GENERATION WARNING LABELS AT BOTH METERS AND GENERATOR DISCONNECTS.
7. THIS DISCONNECT IS REQUIRED ONLY ON 480/277V, THREE-PHASE GENERATOR SELF-CONTAINED METER APPLICATIONS.
8. DUKE PROVIDES AND INSTALLS GENERATOR METER.
9. A GENERATOR SELF-CONTAINED METER BASE IS REQUIRED WHEN THE LARGEST SIZED GENERATION PROTECTION DEVICE DOES NOT EXCEED 400 AMPS. LOCATE ADJACENT TO ELECTRIC SERVICE METER.
10. COMPANY ELECTRIC SERVICE CT'S MAY BE IN A PADMOUNT TRANSFORMER, CT CABINET MOUNTED ON THE BUILDING, A MAST OR UTILITY POLE. FOR INSTANCES WHERE SERVICE IS PROVIDED BY A PADMOUNT TRANSFORMER, THE GENERATOR WIRING MAY BE CONNECTED WITHIN THE SECONDARY COMPARTMENT OF THE TRANSFORMER ONLY IF THERE IS ADEQUATE SPACE AVAILABLE ON THE TRANSFORMER SPADES AND THE CRITERIA PER FIGURE 58 IS NOT EXCEEDED. THIS EXCEPTION MUST BE VERIFIED IN THE FIELD PRIOR TO ANY FINAL DESIGN APPROVAL.



3				
2				
1				
0	8/3/16	ARCHER	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

"NET METERING" GENERATION  
 WITH CT METERED ELECTRIC SERVICE  
 WITH GENERATOR DISCONNECT RATED 400 AMPS OR LESS  
 SOUTH CAROLINA ONLY

DEC	DEM	DEP	DEF
X		X	
FIG 72F			



**NOTES:**

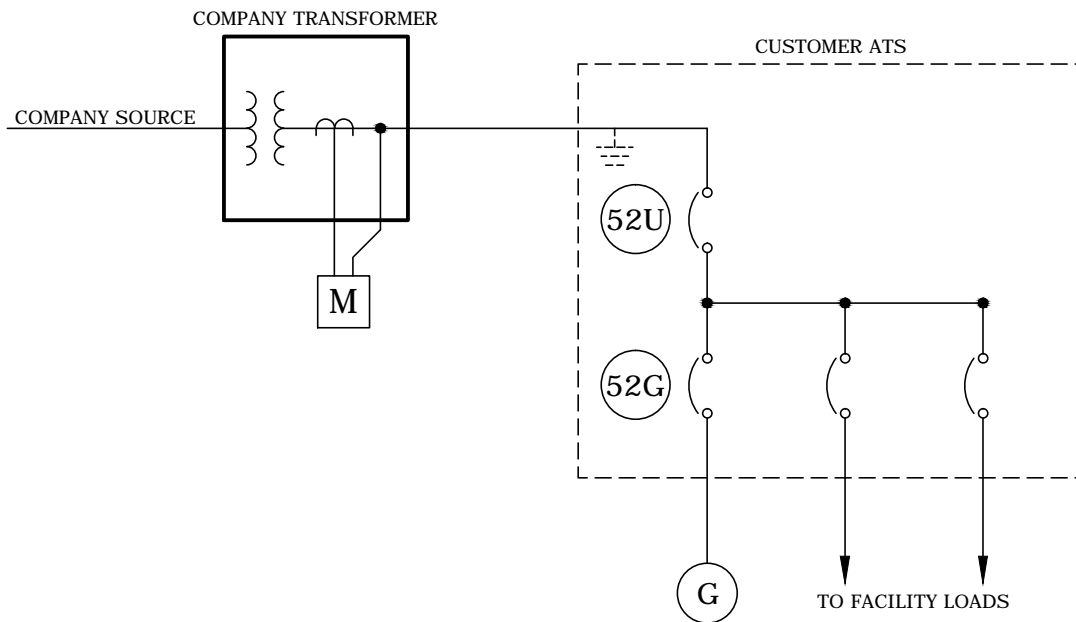
1. GENERATION DISCONNECT CAN BE CONNECTED AT EITHER (A) OR (B) PER N.E.C. ARTICLE 690.64, 705.12(A) OR (D).
2. PV GENERATION DISCONNECT POSITION (A) REQUIREMENTS: MUST BE LOAD-BREAK RATED, LOCKABLE OPEN POSITION AND PROVIDE VISIBLE OPEN. EXCEPTION: FOR DISCONNECTS RATED  $\geq 1000$  AMPS AT 480Y/277 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 MUST BE PLACED AT METER AND GENERATOR DISCONNECT.



3				
2				
1				
0	8/3/16	ARCHER	MEDLIN	CHANDLER
REVISED	BY	CK'D	APPR.	

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

DEC	DEM	DEP	DEF
X		X	
<b>FIG 72G</b>			



### LEGEND:

**G** GENERATOR

**M** METER

**ATS** AUTO-TRANSFER SWITCH

**52U** UTILITY-SIDE BREAKER WITH LOCKABLE OPEN FEATURE

**52G** GENERATOR-SIDE BREAKER



GROUNDING PROVISION PROVIDED BY CUSTOMER TO MEET THE FOLLOWING SPECIFICATIONS:

- ACCESSIBLE TO COMPANY PERSONNEL
- 10' CLEARANCE
- GROUND BALL STUD(S) ON EACH PHASE AND NEUTRAL
  - MOUNTED IN HORIZONTAL POSITION
  - 25MM OR 30MM DIAMETER
  - 4" MIN. LENGTH, INCLUDING BALL
  - FAULT CURRENT RATED FOR GEAR BUSS.
  - MULTIPLE GROUND BALL STUDS MAY BE NEEDED TO MEET AVAILABLE FAULT CURRENT.



3				
2				
1				
0	10/28/15	SIMPSON	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

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

DEC	DEM	DEP	DEF
X	X	X	X
FIG 73A			

### INTERCONNECTION EVALUATION

SYSTEMS IN THIS CATEGORY REQUIRE APPROVAL IN WRITING FROM DUKE ENERGY BEFORE BEING CONNECTED. SPECIFICALLY, INTERCONNECTION OF GENERATING FACILITIES IN THIS CATEGORY MUST BE EVALUATED AND APPROVED BY THE DISTRIBUTION PROTECTION AUTOMATION AND CONTROL GROUP WITHIN DUKE ENERGY.

### INTERCONNECTION PROTECTION (RELAYING) REQUIREMENTS

FOR INTERCONNECTION PROTECTION, THE GENERATING FACILITY'S INTERCONNECTION EQUIPMENT MUST EITHER BE LISTED AS FULLY COMPLIANT WITH UL1741 (FOR INVERTER-BASED EQUIPMENT) OR MUST BE COMPLIANT WITH IEEE 1547 SECTION 4 (INTERCONNECTION TECHNICAL SPECIFICATIONS AND REQUIREMENTS. ADDITIONAL REQUIREMENTS ARE LISTED BELOW:

1. THE DER UNIT SHALL PARALLEL WITH THE AREA COMPANY DISTRIBUTION SYSTEM WITHOUT CAUSING A VOLTAGE FLUCTUATION AT THE POD GREATER THAN +/-5% OF THE PREVAILING VOLTAGE LEVEL OF THE COMPANY DISTRIBUTION SYSTEM AT THE POD. (IEEE 1547-2003 SECTION 4.1.3 SYNCHRONIZATION)
2. THE DER UNIT SHALL NOT ENERGIZE THE COMPANY DISTRIBUTION SYSTEM WHEN THE AREA COMPANY DISTRIBUTION SYSTEM IS DE-ENERGIZED. (IEEE 1547-2003 SECTION 4.1.5 INADVERTENT ENERGIZATION OF THE AREA COMPANY DISTRIBUTION SYSTEM)
3. INTERCONNECTION PROTECTION RELAYING MUST MEASURE VOLTAGES ON THE "UTILITY" SIDE OF 52U. RELAY VOLTAGE INPUTS MUST BE FROM THREE SEPARATE PHASE-TO-GROUND VOLTAGES (FOR 4-WIRE SERVICES) OR FROM THREE SEPARATE PHASE-TO-PHASE VOLTAGES (FOR 3-WIRE SERVICES). REVERSE POWER RELAY (32R) MUST MEASURE CURRENT AT THE 52U BREAKER.
4. INTERCONNECTION PROTECTION RELAYING MUST HAVE FIVE PROTECTIVE ELEMENTS LISTED BELOW WITH SETTINGS AS SPECIFIED:
  - A. 27 (UNDER VOLTAGE): 0.88 PER UNIT, 10 CYCLE TIME DELAY
  - B. 59 (OVER VOLTAGE): 1.10 PER UNIT, 10 CYCLE TIME DELAY
  - C. 81U (UNDER FREQUENCY): 59.5 HZ, 10 CYCLE TIME DELAY
  - D. 81O (OVER FREQUENCY): 60.5 HZ, 10 CYCLE TIME DELAY
  - E. 32R (REVERSE POWER): WATTS SET AT 5% OF TOTAL GENERATING CAPACITY, WITH A 1.0 SECOND TIME DELAY
5. INTERCONNECTION PROTECTION RELAY TRIP FUNCTIONS MUST CAUSE SEPARATION OF THE GENERATION FROM THE UTILITY, EITHER BY (1) TRIPPING ALL GENERATORS [52G] BREAKERS OR BY (2) TRIPPING ALL UTILITY MAIN [52U] BREAKERS.
6. SERVICE ENTRANCE DISCONNECTING EQUIPMENT WITH VISIBLE OPENING CAPABILITY AND GROUNDING PROVISIONS. THIS INCLUDES THE ABILITY TO LOCK OPEN OR "RACK-OUT" THEIR UTILITY BREAKER OR SERVICE ENTRANCE DISCONNECT.
7. THE INTERCONNECTION PROTECTION EQUIPMENT MUST HAVE A SYNCHRONIZATION CHECK FUNCTION (25 RELAY).
8. CUSTOMER MUST PROVIDE A DOCUMENT STAMPED BY A LICENSED PROFESSIONAL ENGINEER (LICENSED IN THE STATE WHERE THE GENERATING FACILITY IS TO BE LOCATED) SHOWING APPROVAL OF CUSTOMER'S DESIGN AND TESTING OF SYSTEM OPERATION MEETS DUKE ENERGY REQUIREMENTS FOR MOMENTARY PARALLEL OPERATION.
9. CUSTOMER MUST SIGN AN INTERCONNECTION AGREEMENT BEFORE MOMENTARY PARALLEL OPERATION IS ALLOWED.



3				
2				
1				
0	10/28/15	VALENTIN	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

STANDBY GENERATION - PROTECTION REQUIREMENTS  
(SOFT LOAD TRANSITION  
> 100 MILLISECONDS PARALLEL TIME)

DEC	DEM	DEP	DEF
X	X	X	X
FIG 73B			

#### INTERCONNECTION EVALUATION

SYSTEMS IN THIS CATEGORY REQUIRE APPROVAL IN WRITING FROM DUKE ENERGY BEFORE BEING CONNECTED. SPECIFICALLY, INTERCONNECTION OF GENERATING FACILITIES IN THIS CATEGORY MUST BE EVALUATED AND APPROVED BY THE DISTRIBUTION PROTECTION AUTOMATION AND CONTROL GROUP WITHIN DUKE ENERGY.

#### INTERCONNECTION PROTECTION (RELAYING) REQUIREMENTS

FOR INTERCONNECTION PROTECTION, THE GENERATING FACILITY'S INTERCONNECTION EQUIPMENT MUST EITHER BE LISTED AS FULLY COMPLIANT WITH UL1741 (FOR INVERTER-BASED EQUIPMENT) OR MUST BE COMPLIANT WITH IEEE 1547 SECTION 4 (INTERCONNECTION TECHNICAL SPECIFICATIONS AND REQUIREMENTS); VOLTAGE AND FREQUENCY SET-POINTS MUST BE SAME AS "DEFAULT" UNLESS OTHERWISE APPROVED BY DUKE ENERGY. ADDITIONAL REQUIREMENTS ARE LISTED BELOW:

1. THE DER UNIT SHALL PARALLEL WITH THE COMPANY DISTRIBUTION SYSTEM WITHOUT CAUSING A VOLTAGE FLUCTUATION AT THE POD GREATER THAN +/-5% OF THE PREVAILING VOLTAGE LEVEL OF THE COMPANY DISTRIBUTION SYSTEM AT THE POD. (IEEE 1547-2003 SECTION 4.1.3 SYNCHRONIZATION)
2. THE DER UNIT SHALL NOT ENERGIZE THE COMPANY DISTRIBUTION SYSTEM WHEN THE COMPANY DISTRIBUTION SYSTEM IS DE-ENERGIZED. (IEEE 1547-2003 SECTION 4.1.5 INADVERTENT ENERGIZATION OF THE COMPANY DISTRIBUTION SYSTEM)
3. SERVICE ENTRANCE DISCONNECTING EQUIPMENT WITH VISIBLE OPENING CAPABILITY AND GROUNDING PROVISIONS. THIS INCLUDES THE ABILITY TO LOCK OPEN OR "RACK-OUT" THEIR UTILITY BREAKER OR SERVICE ENTRANCE DISCONNECT.
4. THE INTERCONNECTION EQUIPMENT MUST HAVE A SYNCHRONIZATION CHECK FUNCTION (25 RELAY).
5. THE INTERCONNECTION EQUIPMENT MUST HAVE A SEPARATE TIMER THAT WILL INITIATE THE SEPARATION OF THE GENERATOR AND THE UTILITY IF THE PARALLELING TIME EXCEEDS 100MS.
6. THE DER UNIT SHALL NOT BACK FEED (INTENDED OR NON-INTENDED) THE UTILITY SYSTEM.
7. CUSTOMER MUST PROVIDE A DOCUMENT STAMPED BY A LICENSED PROFESSIONAL ENGINEER (LICENSED IN THE STATE WHERE THE GENERATING FACILITY IS TO BE LOCATED) SHOWING APPROVAL OF CUSTOMER'S DESIGN AND TESTING OF SYSTEM OPERATION MEETS DUKE ENERGY REQUIREMENTS FOR MOMENTARY PARALLEL OPERATION.
8. CUSTOMER MUST SIGN AN INTERCONNECTION AGREEMENT BEFORE MOMENTARY PARALLEL OPERATION IS ALLOWED.



3				
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0	7/2/15	VALENTIN	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

STANDBY GENERATION - PROTECTION REQUIREMENTS  
MOMENTARY PARALLEL GENERATION  
(FAST TRANSITION  $\leq 100$  MILLISECONDS PARALLEL TIME)

DEC	DEM	DEP	DEF
X	X	X	X

FIG 74

GENERAL REQUIREMENTS APPLICABLE TO ALL PARALLELING GENERATION

1. THE INTERCONNECTION OF ANY DISTRIBUTED ENERGY RESOURCE (DER) UNIT ON THE DUKE ENERGY SYSTEM WILL NOT BE PERMITTED IF IT DEGRADES SERVICE TO OTHER CUSTOMERS. INTERCONNECTION CUSTOMERS ARE RESPONSIBLE FOR THE COST OF ANY NECESSARY CHANGES OR UPGRADES TO THE DUKE ENERGY DISTRIBUTION AND/OR TRANSMISSION SYSTEM REQUIRED TO PROPERLY INTEGRATE THE GENERATION SO AS TO MAINTAIN APPROPRIATE SERVICE TO DUKE ENERGY CUSTOMERS.
2. THE INTERCONNECTION CUSTOMER IS SOLELY RESPONSIBLE FOR THE ELECTRICAL PROTECTION OF THEIR FACILITIES. DUKE ENERGY EQUIPMENT MAY INADVERTENTLY PROVIDE SOME PROTECTION TO THE DER CUSTOMER'S FACILITY AS IT OPERATES TO PROTECT THE UTILITY SYSTEM, HOWEVER, NO LIABILITY IS ASSUMED BY DUKE ENERGY.
3. DUKE ENERGY OWNED INTERCONNECTION PROTECTION EQUIPMENT (WHEN PROVIDED), IS FOR THE PROTECTION OF THE DISTRIBUTION SYSTEM FROM MALFUNCTION OR MISOPERATION OF THE DER UNIT.
4. DUKE ENERGY MAY DISCONNECT A DER FACILITY FROM THE DISTRIBUTION SYSTEM AT ANY TIME PURSUANT TO, BUT NOT LIMITED TO, THE FOLLOWING CONDITIONS:
  - EXPIRATION, TERMINATION, OR LACK OF INTERCONNECTION AGREEMENT (IF ORIGINALLY APPLICABLE)
  - NON-COMPLIANCE WITH TECHNICAL REQUIREMENTS
  - CASES WHERE CONTINUED INTERCONNECTION WILL ENDANGER PERSONS OR PROPERTY
  - A FORCED OR PLANNED OUTAGE OF THE DISTRIBUTION SYSTEM FOR REPAIRS OR MAINTENANCE
  - UNDER HOT LINE TAG CONDITIONS (UTILITY REPAIR OR MAINTENANCE WORK ON FACILITIES WHILE ENERGIZED)
  - ANY OTHER SYSTEM EMERGENCY
5. DER FACILITIES MUST COMPLY WITH THE NATIONAL ELECTRIC CODE AND MUST PASS A SUCCESSFUL INSPECTION BY LOCAL JURISDICTIONAL AUTHORITIES. IF THE GOVERNING ELECTRICAL INSPECTOR INDICATES THAT THE INSTALLATION IS EXEMPT FROM INSPECTION, A WRITTEN, SIGNED STATEMENT FROM THE GOVERNING ELECTRICAL INSPECTOR FOR THE SPECIFIC INSTALLATION WILL BE REQUIRED BEFORE DUKE ENERGY WILL INSTALL A METER.

INTERCONNECTION PROTECTION OWNERSHIP BASED ON GENERATOR TYPE AND SIZE

IN GENERAL, DISTRIBUTED GENERATION SYSTEMS ARE CLASSIFIED IN TWO MAIN CATEGORIES: INVERTER BASED SYSTEMS AND ROTATING MACHINE BASED SYSTEMS.

DG CATEGORY AND SIZE	INTERCONNECTION PROTECTION OWNERSHIP
INVERTER BASED < 250KW	CUSTOMER OWNED
INVERTER BASED ≥ 250KW TO <1MW	OPTIONAL, CUSTOMER OWNED OR UTILITY OWNED
INVERTER BASED ≥ 1MW AND ALL ROTATING BASED	UTILITY OWNED

3				
2				
1				
0	7/2/15	VALENTIN	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

LONG TERM PARALLEL GENERATION  
INTERCONNECTION PROTECTION OWNERSHIP  
BASED ON GENERATOR TYPE AND SIZE



DEC	DEM	DEP	DEF
X	X	X	X

FIG 75A

## INTERCONNECTION PROTECTION REQUIREMENTS

### INVERTER BASED SYSTEMS < 250KW

FOR GENERATING FACILITIES IN THIS CATEGORY, INTERCONNECTION PROTECTION WILL BE OWNED AND OPERATED BY THE INTERCONNECTION CUSTOMER. DUKE ENERGY'S MINIMUM REQUIREMENTS FOR CUSTOMER OWNED INTERCONNECTION PROTECTION IN THIS CATEGORY IS AS FOLLOWS:

1. INVERTERS HAVE TO BE TESTED AND LISTED FOR COMPLIANCE WITH THE LATEST PUBLISHED EDITION OF UNDERWRITER LABORATORIES INC., UL 1741 FOR UTILITY INTERACTIVE INVERTERS.
2. INTERCONNECTION PROTECTION EQUIPMENT SHALL COMPLY WITH THE LATEST EDITION OF IEEE 1547 AND APPLICABLE SERIES STANDARDS.
3. SINGLE-PHASE INVERTERS SHALL BE MANUFACTURED AFTER NOVEMBER 7, 2000.
4. THREE-PHASE INVERTERS SHALL BE MANUFACTURED AFTER MAY 7, 2007
5. VOLTAGE AND FREQUENCY SET-POINTS MUST BE SAME AS "DEFAULT".
6. CUSTOMER SHALL PROVIDE A MANUAL LOAD-BREAK RATED DISCONNECT SWITCH TO SERVE AS A CLEAR VISIBLE INDICATION OF SWITCH POSITION BETWEEN THE UTILITY AND THE INTERCONNECTION CUSTOMER. THE SWITCH MUST BE LOCKABLE IN THE OPEN POSITION, ADJACENT TO THE METER AND READILY ACCESSIBLE TO UTILITY PERSONNEL. (SEE FIGURE 69.)

### INVERTER BASED SYSTEMS ≥250KW TO <1MW

FOR GENERATING FACILITIES IN THIS CATEGORY, INTERCONNECTION PROTECTION OWNERSHIP WILL BE OPTIONAL. INTERCONNECTION PROTECTION EQUIPMENT MAY BE OWNED AND OPERATED BY THE INTERCONNECTION CUSTOMER OR BY DUKE ENERGY.

CUSTOMER OWNED INTERCONNECTION PROTECTION EQUIPMENT AND SETTINGS FOR GENERATING FACILITIES IN THIS CATEGORY MUST BE EVALUATED AND APPROVED BY THE DISTRIBUTION PROTECTION AUTOMATION AND CONTROL GROUP WITHIN DUKE ENERGY. DUKE ENERGY'S MINIMUM REQUIREMENTS FOR CUSTOMER OWNED INTERCONNECTION PROTECTION IN THIS CATEGORY IS AS FOLLOWS:

1. REQUIREMENTS 1, 2 AND 4 FROM SECTION ABOVE (INVERTERS < 250KW).
2. INVERTER PROTECTIVE SETTINGS SHALL BE SET PER THE FOLLOWING:

UNDER VOLTAGE SET-POINT #1 (27-1)	0.88 PER UNIT, 2 SECOND DELAY
UNDER VOLTAGE SET-POINT #2 (27-2)	0.50 PER UNIT, 0.16 SECOND DELAY
OVER VOLTAGE SET-POINT #1 (59-1)	1.10 PER UNIT, 1.0 SECOND DELAY
OVER VOLTAGE SET-POINT #2 (59-2)	1.20 PER UNIT, 0.16 SECOND DELAY
UNDER FREQUENCY SET-POINT (81U)	59.3, 0.16 SECOND DELAY
OVER FREQUENCY SET-POINT (81O)	60.5, 0.16 SECOND DELAY

3. INVERTER PROTECTIVE SETTINGS SHALL BE DOCUMENTED IN A COMMISSIONING TEST REPORT SUBMITTED TO DUKE ENERGY.
4. CUSTOMER SHALL PROVIDE A MANUAL LOAD-BREAK RATED DISCONNECT SWITCH TO SERVE AS A CLEAR VISIBLE INDICATION OF SWITCH POSITION BETWEEN THE UTILITY AND THE INTERCONNECTION CUSTOMER. THE SWITCH MUST BE LOCKABLE IN THE OPEN POSITION, ADJACENT TO THE METER AND READILY ACCESSIBLE TO UTILITY PERSONNEL. (SEE FIGURE 69.)
5. CUSTOMER MUST PROVIDE A REPORT STAMPED BY A LICENSED PROFESSIONAL ENGINEER (LICENSED IN THE STATE WHERE THE GENERATING FACILITY IS TO BE LOCATED) DOCUMENTING CUSTOMER'S EQUIPMENT, SYSTEM DESIGN AND INTERCONNECTION PROTECTION MEETS DUKE ENERGY'S REQUIREMENTS, IEEE 1547 AND UL 1741.

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0	10/28/15	VALENTIN	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

## LONG TERM PARALLEL GENERATION INVERTER BASED SYSTEMS < 1MW INTERCONNECTION PROTECTION REQUIREMENTS



DEC	DEM	DEP	DEF
X	X	X	X

FIG 75B

### **INVERTER BASED SYSTEMS $\geq$ 1MW AND ALL ROTATING MACHINE BASED GENERATORS**

FOR GENERATING FACILITIES IN THIS CATEGORY, INTERCONNECTION PROTECTION EQUIPMENT WILL BE OWNED AND OPERATED BY DUKE ENERGY. INTERCONNECTION PROTECTION EQUIPMENT SETTINGS WILL BE EVALUATED AND APPROVED BY THE DISTRIBUTION PROTECTION AUTOMATION AND CONTROL GROUP WITHIN DUKE ENERGY. DUKE ENERGY'S MINIMUM REQUIREMENTS FOR INTERCONNECTION PROTECTION IN THIS CATEGORY IS AS FOLLOWS:

1. DUKE ENERGY'S PROTECTION EQUIPMENT WILL INCLUDE A RECLOSER, RELAYING (CONTROL) AND REMOTE COMMUNICATIONS FOR MONITORING AND OPERATIONS.
2. DUKE ENERGY'S PROTECTION EQUIPMENT SHALL INCLUDE OVER CURRENT, OVER/UNDER VOLTAGE AND OVER/UNDER FREQUENCY RELAYING.
3. INVERTERS HAVE TO BE TESTED AND LISTED FOR COMPLIANCE WITH THE LATEST PUBLISHED EDITION OF UNDERWRITER LABORATORIES INC., UL 1741 FOR UTILITY INTERACTIVE INVERTERS.
4. CUSTOMER'S INTERCONNECTION SYSTEM SHALL COMPLY WITH THE LATEST EDITION OF IEEE 1547 AND APPLICABLE SERIES STANDARDS.
5. DUKE ENERGY SHALL PROVIDE A MANUAL LOAD-BREAK RATED DISCONNECT SWITCH TO SERVE AS A CLEAR VISIBLE INDICATION OF SWITCH POSITION BETWEEN THE UTILITY AND THE INTERCONNECTION CUSTOMER. THE SWITCH MUST BE READILY ACCESSIBLE TO UTILITY PERSONNEL.
6. FOR DEP REFERENCE FIGURES 70B AND 71B.

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0	7/2/15	VALENTIN	SIMPSON	ADCOCK
REVISED	BY	CK'D	APPR.	

LONG TERM PARALLEL GENERATION  
INVERTER BASED SYSTEMS  $\geq$ 1MW AND  
ALL ROTATING MACHINE BASED GENERATORS



DEC	DEM	DEP	DEF
X	X	X	X

**FIG 75C**



# APPENDIX A - PAGE 1 (DEC ONLY)



## NONRESIDENTIAL SERVICE REQUEST/LOAD SHEET FORM

**So that we may provide you with timely and accurate service, please complete all five sections of the form.**

Duke Energy will assess a **nonrefundable connect fee** for all newly activated electric accounts.

The Delivery Information and Load/Equipment Information sections are needed by our engineering group to accurately meet your electrical requirements. **Please be aware that a load sheet is required for each meter.** If this information is not available at this time, please complete the billing information, service (site) address information and additional contact information sections so we can initiate your service request.

Please email, fax or mail this information to:

**Email – [loadsheets@duke-energy.com](mailto:loadsheets@duke-energy.com) Fax - 800.943.6910**

**Mail – Duke Energy, Attn: Business & Industry, 9700 David Taylor Drive, Charlotte, NC 28262-2363**

### 1) BILLING INFORMATION – Complete applicable fields.

Customer's legal billing name (should match Federal Tax ID)

Form of ownership: ☐ Sole Proprietor ☐ Corporation ☐ Limited Liability Corporation  
☐ Partnership ☐ Limited Liability Partnership

Doing Business As (DBA): \_\_\_\_\_ Federal tax ID/SSN: \_\_\_\_\_

Mailing address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Additional mailing information: \_\_\_\_\_

Billing contact name: \_\_\_\_\_ Title: \_\_\_\_\_

Daytime phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Property ownership: ☐ Own ☐ Rent/Lease

Name of property owner: \_\_\_\_\_ Phone: \_\_\_\_\_

Have you ever had nonresidential service with Duke Energy? ☐ Yes ☐ No

If yes, list other Duke Energy account number or service address: \_\_\_\_\_

If no, provide Dun & Bradstreet (D&B) number if applicable: \_\_\_\_\_

### 2) SERVICE (SITE) ADDRESS INFORMATION – Complete applicable fields.

☐ New service (no existing service lines)

☐ Existing service (existing service lines)

☐ Upgrade existing service (no existing service lines)

Provide Duke Energy account number or meter number: \_\_\_\_\_

Service address/location: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

County: \_\_\_\_\_

Directions from a main road: \_\_\_\_\_

What type of business or facility will this meter serve? (e.g., auto assembly plant, high school, retail shoe store) \_\_\_\_\_

Actual hours of operation: M – F \_\_\_\_\_ Weekends \_\_\_\_\_ Other \_\_\_\_\_

Requested by: \_\_\_\_\_ Title: \_\_\_\_\_

Daytime phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Alternate phone: \_\_\_\_\_ Date service needed: \_\_\_\_\_

**NOTE: A final inspection may be needed to complete your service request. Check with the appropriate city or county inspections department to determine their communication procedures with Duke Energy.**



3				
2				
1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

NONRESIDENTIAL SERVICE REQUEST/LOAD SHEET FORM

DEC	DEM	DEP	DEF
X			

## APPENDIX A - PAGE 2 (DEC ONLY)

**3) ADDITIONAL CONTACT INFORMATION – Complete applicable fields.**

General contractor/builder name:	Electrician/engineer name:
Daytime phone:	Daytime phone:
Alternate phone:	Alternate phone:
Fax:	Fax:
Email:	Email:

**4) DELIVERY INFORMATION – Complete applicable fields. (We do not accept electrical schematics in place of this form.)**

Total (kW) load: Additional (kW) load only:

Check box if this will be service to a shell space. ☐

Check service desired:    ☐ Overhead    ☐ Underground

Customer wire type: ☐ Copper ☐ Aluminum

Check phase desired: ☐ Single-phase ☐ Three-phase

Delivery voltage: \_\_\_\_\_ (Volts)      Number of wires: ☐ 3 ☐ 4

Service panel size: \_\_\_\_\_ amps

Number of conductors per phase: \_\_\_\_\_ Size of conductors: \_\_\_\_\_

Number of neutral conductors: \_\_\_\_\_ Size of neutral: \_\_\_\_\_

NOTE: If underground three-phase service is required, the maximum number of conductors per phase varies based on wire size (for example: 8 for 700 MCM to 750 MCM and 10 for 600 MCM and smaller).

Gross square footage: \_\_\_\_\_ Conditioned square footage: \_\_\_\_\_

Duke Energy work request:

Send confirmation fax to: \_\_\_\_\_ Fax: \_\_\_\_\_

**5) LOAD/EQUIPMENT INFORMATION – Complete applicable fields.**

Lighting/Receptacle	Water Heating			
Interior Lights (Total kW)	Domestic	Sanitary	Booster	Instant/Tankless
Exterior Lights (Total kW)	Quantity	Quantity	Quantity	Quantity
Receptacles (Quantity)	Gallons	Gallons	Gallons	
Receptacles (Total kW)	Total kW	Total kW	Total kW	Total kW

HEATING/COOLING			
Type of Heating/Cooling List heating/cooling source below. (Examples: heat pump, strip heat, electric furnace, chiller, water source heating)	QTY	Size (tons or kW preferred)	kW (per unit)
Backup heating source (if applicable)			

Provide starting/lock rotor amps for the largest unit \_\_\_\_\_. If this unit has starting compensation, provide a description:

**Note: Starting compensation required on units greater than 5 tons (7.5 kW).**



3				
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1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED		BY	CK'D	APPR.

# NONRESIDENTIAL SERVICE REQUEST/LOAD SHEET FORM

	DEC	DEM	DEP	DEF
X				

# APPENDIX A - PAGE 3 (DEC ONLY)

FOOD SERVICE EQUIPMENT			
Type of Equipment (Cooking, refrigeration, other)	Description (Range, refrigerator, freezer, microwave, etc.)	QTY	kW (per unit)

MOTOR DATA				
Description of Each Motor (Motors not included elsewhere on this form)	QTY	HP (per unit)	Starting Frequency No. Times/Interval	Three-Phase Y/N

Provide starting/lock rotor amps for the largest motor \_\_\_\_\_. If this motor has starting compensation, provide a description: \_\_\_\_\_

**Note: Starting compensation required on units greater than 7.5HP (7.5 kW).**

OTHER MISCELLANEOUS EQUIPMENT					
Type of Equipment (Welder, X-ray, MRI)	QTY	Amps (per unit)	Volts (per unit)	kW (per unit)	Three-Phase Y/N

Provide starting/lock rotor amps for the largest unit \_\_\_\_\_. If this unit has starting compensation, provide a description: \_\_\_\_\_

**Note: Starting compensation required on units greater than 5 tons (7.5 kW).**

**Special Instructions: Please copy load equipment page for additional equipment that was not captured above. Please note any special instructions below.**

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**Questions? Please call 800.653.5307**

Form 10230 (R11/07) Stock Code 89682



3				
2				
1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

NONRESIDENTIAL SERVICE REQUEST/LOAD SHEET FORM

DEC	DEM	DEP	DEF
X			

# APPENDIX B - PAGE 1

— b



Dear Duke Energy Customer,

Duke Energy is pleased to provide your electric service. In doing so, our goal is to meet your request with the least possible disturbance to your property without damaging any underground objects that may be present.

To provide the service you have requested, we must rely on your knowledge of any underground objects or obstructions that may impede the installation of poles, apparatus or underground facilities. You are the primary source of information about such objects or obstructions that could be damaged by Duke Energy or our contractor's equipment.

In the interest of safety and a damage-free and timely installation, please do the following:

1. Use the checklist(s) below to ensure all site readiness requirements are completed.
2. Acknowledge that you understand the Electric Service Installation Provisions.

You may be responsible for any additional costs incurred by Duke Energy due to our inability to perform work on schedule as a result of the site not being ready or remaining ready until all work has been completed. If you have questions about these provisions or your electric service, please ask the Duke Energy representative handling your request. Thank you for your cooperation, and we look forward to providing you a safe and timely installation.

## Site Readiness Checklist

*NOTE: All marking/locating of lines and other customer-owned equipment must be done with flags, stakes or paint.*

CUSTOMER NAME: \_\_\_\_\_ SERVICE ADDRESS: \_\_\_\_\_

SITE READY DATE: \_\_\_\_\_ DATE SERVICE NEEDED (REQUIRED DATE): \_\_\_\_\_

REQUIRED	REQUIREMENT	COMPLETED
<input type="checkbox"/>	Route clear (minimum 10 feet width from source to meter base).	<input type="checkbox"/>
<input type="checkbox"/>	Grading within 6 inches of final or to final grade as indicated on Electric Service Installation Provisions.	<input type="checkbox"/>
<input type="checkbox"/>	Builder/private underground obstacles (lines, tanks, tree protection zones, etc.) located and marked.	<input type="checkbox"/>
<input type="checkbox"/>	Self-contained meter base ready (meter base, load-side conductors, grounding rod and conductor installed) or meter base location guaranteed.	<input type="checkbox"/>
<input type="checkbox"/>	CT cabinet/metering trough location marked/installed as indicated on CT metering site ready.	<input type="checkbox"/>
<input type="checkbox"/>	I have been shown the pictures of Duke Energy's standard UG installation equipment and understand the potential impact to my property.	<input type="checkbox"/>
<input type="checkbox"/>	Large truck route clear to access poles, transformers or other Duke Energy equipment.	<input type="checkbox"/>
<input type="checkbox"/>	Work only in dry conditions to prevent yard damage.	<input type="checkbox"/>
<input type="checkbox"/>	Individual right of way signed and returned. All other rights of way properly executed and returned.	<input type="checkbox"/>
<input type="checkbox"/>	Contribution-in-aid of construction obligation is met.	<input type="checkbox"/>
<input type="checkbox"/>	Concrete transformer pad is poured and metering conduit installed per specifications.	<input type="checkbox"/>
<input type="checkbox"/>	Conduit installed, as discussed with project designer, for underground primary or service installations per specifications.	<input type="checkbox"/>
<input type="checkbox"/>	In multi-unit structures, all meter boxes are permanently and correctly marked/installed.	<input type="checkbox"/>
<input type="checkbox"/>	I have read, understood and accepted the Electric Service Installation Provisions' terms.	<input type="checkbox"/>
<input type="checkbox"/>	As a developer, I understand my responsibilities outlined on the attached Subdivision/Multi-Family Checklist.	<input type="checkbox"/>
<input type="checkbox"/>	I have notified Duke Energy of the completion of the above site-ready requirements.	<input type="checkbox"/>
<input type="checkbox"/>	The maximum number of customer conductors per phase – 10 for 600 MCM or smaller, 8 for 750 MCM or larger.	<input type="checkbox"/>
<input type="checkbox"/>	I have received a copy of the Duke Energy Padmounted Transformer Building Clearance Standard.	<input type="checkbox"/>
<input type="checkbox"/>		<input type="checkbox"/>

Once you have satisfied all of the requirements checked above and, if applicable, on the accompanying metering sheet, please report to Duke Energy that your site is ready for service by calling \_\_\_\_\_ or by faxing this form to \_\_\_\_\_, referring to Work Order # (Customer Job #) \_\_\_\_\_.

OWNER/CUSTOMER SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

**Your request will not be scheduled until you have completed this notification. Standard scheduling and construction lead-times must be allowed before expecting delivery of your service. Thank you.**



DEC	DEM	DEP	DEF
X		X	

## SITE READY CHECKLIST

3				
2				
1				
0	1/6/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

# APPENDIX B - PAGE 2

## Electric Service Installation Provisions

WO# \_\_\_\_\_

(Internal Use Only)

I, \_\_\_\_\_, have requested that Duke Energy install above ground or underground electric service conductors at my home/business located at \_\_\_\_\_.

In making this request, I agree to the following checked provisions:

1. ☐ While Duke Energy is responsible for locating publicly owned underground utility lines (telephone, catv, gas) I am responsible for identifying for Duke Energy or its agent the correct location of all underground objects that might be damaged by or cause damage to Duke Energy's equipment or its contractor's equipment in the process of installation. Underground objects include but are not limited to: septic tanks, drain lines, drain fields, designated repair areas, water lines, irrigation lines and electrical lines not owned by Duke Energy.
2. ☐ Once I have physically marked the underground objects, within + or - 30 inches, using paint, flags or stakes, Duke Energy or its contractor will assume responsibility for avoiding damage to said objects.
3. ☐ I assume full responsibility for any damage to underground objects caused by my failure to notify or incorrectly notify Duke Energy of the location of the underground objects.
4. ☐ Duke Energy or its contractor will assume responsibility for performing said installation in a professional manner by avoiding damage to obvious above ground objects such as curbs, gutters, shrubbery, sidewalks and buildings.
5. ☐ I understand the specific route of the proposed above ground or underground conductors and location of poles and/or apparatus as described by the Duke Energy representative.
6. ☐ In the course of installing underground lines and equipment in areas with landscape trees, there is the probability of some root damage and I will not hold Duke Energy or its contractor responsible for damage to or the health of any trees.
7. ☐ Equipment tracks and ground disturbance will result from the use of equipment necessary for the installation of above ground or underground facilities.
8. ☐ Duke Energy or its contractor will not be responsible for providing nonstandard erosion control measures, reseeding lawns or replacing gravel in the area(s) disturbed due to the installation of poles, apparatus (such as transformers or pedestals) or underground facilities.
9. ☐ I understand that I am responsible for complying with any state or federal requirements related to stormwater discharge including any site stabilization measures.
10. ☐ I may be required to pay a contribution-in-aid of construction if rock or other adverse conditions are encountered. Refer to the Underground Distribution Installation Plan (copy available upon request). Costs associated with lighting installations may vary from those listed below or could potentially be less if your project involves joint installation with other utilities. These conditions include but are not limited to the following examples (applicable sales tax not included):

### EXAMPLES OF CHARGES

Provide trench in rock  
Place clean sand/clay backfill in a standard trench  
Provide clean sand/clay backfill from off site  
Provide conduit in trench  
Punching under roads/driveways/sidewalk  
Pull single-phase secondary/primary cable in customer conduit  
Mechanical tamping to avoid settling of trench  
Guaranteed meter base location changes more than 10 feet at time of installation  
Crew delay due to customer or site conditions  
Engineering costs  
Other (Ex: rock hole for pole) \_\_\_\_\_

**Contact your  
Duke Energy representative  
for current costs**

11. ☐ To meet National Electric Safety Codes, work site grading and landscaping must be \_\_\_\_\_ at final grade or \_\_\_\_\_ within 6 inches of final grade (Duke Energy representative to initial appropriate item) before installation of underground facilities. Refer to Underground Distribution Installation Plan (copy available upon request).
12. ☐ I understand that I may be responsible for any additional costs incurred by Duke Energy due to Duke Energy's inability to perform work on schedule as a result of my failure to have the site ready or remain ready until all work has been completed.
13. ☐ I have requested that Duke Energy install underground facilities on the property listed above. In making this request, I agree to be the single point of contact for Duke Energy and agree to be financially responsible to Duke Energy for any damage to Duke Energy's equipment that is caused by a contractor retained by me.
14. ☐ I have provided Duke Energy with the correct load information to size the electrical facilities required by this request for service. I understand that there may be charges if the actual load requires Duke Energy to alter electrical facilities installed for this request for service.
15. ☐ I assume full responsibility to determine if there are any lighting ordinances or restrictions that would prohibit the installation of the service requested.
16. ☐ I agree to allow Duke Energy or its contractor to drive vehicles/equipment on my concrete drive or walkway and I will not hold Duke Energy or its contractor responsible for damage to my concrete drive or walkway.
17. ☐ These provisions have been explained to me and I have received a copy of this document.

OWNER/CUSTOMER SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

DUKE ENERGY REPRESENTATIVE \_\_\_\_\_

PHONE NUMBER \_\_\_\_\_

FAX NUMBER \_\_\_\_\_

DATE \_\_\_\_\_



DEC	DEM	DEP	DEF
X		X	

## ELECTRIC SERVICE INSTALLATION PROVISIONS

3				
2				
1				
0	1/6/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

# APPENDIX B - PAGE 3

## CT Metering Site Readiness Checklist

REQUIRED	REQUIREMENT	COMPLETED
	<b>IF UTILIZING A CT CABINET FOR UNDERGROUND DELIVERY:</b>	
<input type="checkbox"/>	CT cabinet up – size as specified by project designer : <input type="checkbox"/> 32" W x 24" H x 12" D <input type="checkbox"/> 40" W x 40" H x 14" D <input type="checkbox"/> 60" W x 60" H x 18" D	<input type="checkbox"/>
<input type="checkbox"/>	CT cabinet to have latch assembly and 3/4-inch exterior grade plywood backboard or other Duke Energy-approved means to mount CTs on back cabinet wall.	<input type="checkbox"/>
<input type="checkbox"/>	Bottom of CT cabinet is mounted a minimum 30" (for 24" x 32" box), 24" (for 40" x 40" box), or 12" (for 60" x 60" box) above final grade with room to mount meter box 4' – 6' high (to center of meter) beside cabinet.	<input type="checkbox"/>
<input type="checkbox"/>	CT cabinet to have a grounding lug attached to inside of cabinet capable of accepting #14 to #2 CU or AL conductors.	<input type="checkbox"/>
<input type="checkbox"/>	Cut hole in CT cabinet/trough or meter enclosure. (See Duke Energy CT Cabinet Installation Guidelines.) Quantity: 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> Size: 2" <input type="checkbox"/> 3" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input type="checkbox"/>	<input type="checkbox"/>
	<b>IF UTILIZING OPTIONAL METER TROUGH WITH TRANSOCKET INSTALLATION:</b>	
<input type="checkbox"/>	Transocket (25" W x 33" H x 12" D) installed with center of meter 4' – 6' high.	<input type="checkbox"/>
	<b>IF OVERHEAD DELIVERY:</b>	<input type="checkbox"/>
<input type="checkbox"/>	Mast should be installed, customer wires pulled out (minimum of 24-inch conductor lead length) and area to mount meter box should be clear of any obstructions.	<input type="checkbox"/>
<input type="checkbox"/>	If mast extends through roof, electrician will need to install metering conduit.	<input type="checkbox"/>

Reference the "Customer Metering Guide" brochure provided by the project designer for specific guidelines for metering underground service installations.

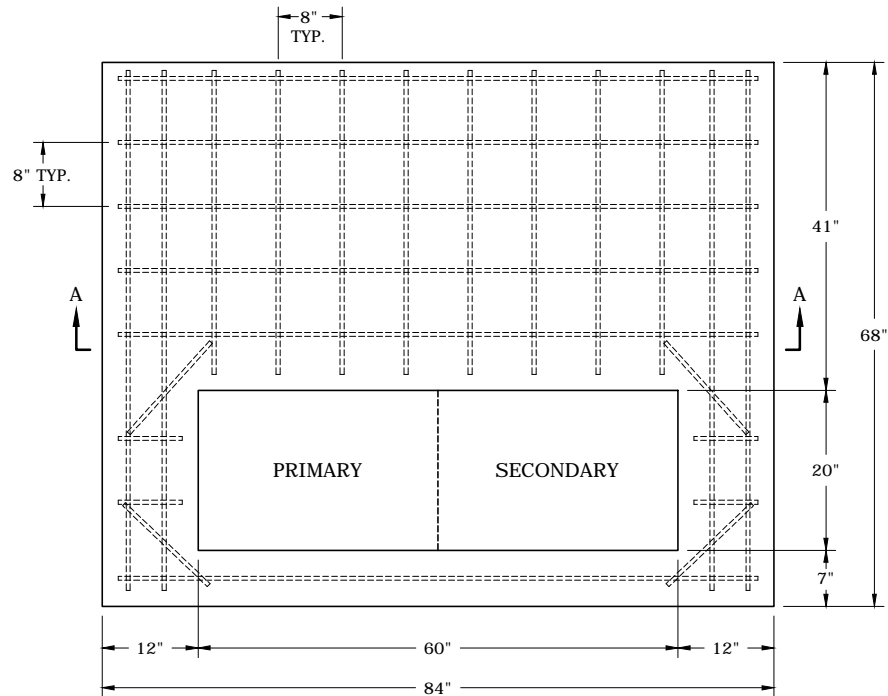


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0	1/6/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

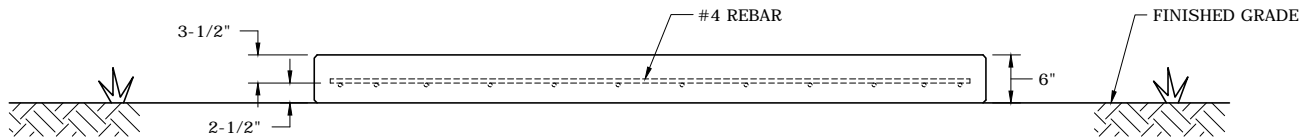
## CT METERING SITE READINESS CHECKLIST

DEC	DEM	DEP	DEF
X		X	

# APPENDIX C - PAGE 1



PLAN VIEW



SECTION 'A-A'

## NOTES:

1. TRANSFORMER PADS SHALL BE INSTALLED IN A LOCATION TO REMAIN READILY ACCESSIBLE FOR LINE TRUCKS. PADS SHALL HAVE A MINIMUM CLEARANCE FROM OBSTRUCTIONS AND BUILDINGS AS GIVEN IN FIGURE 52.
2. SOIL UNDERNEATH PADS SHALL BE FREE OF ROOTS AND OTHER ORGANIC MATERIALS AND BE THOROUGHLY TAMPED TO PREVENT WASHING. EXERCISE CARE IN BACKFILLING AND GRADING AROUND PAD.
3. SERVICE CONDUIT SHALL BE LOCATED IN THE EXTREME RIGHT SIDE OF THE SECONDARY COMPARTMENT.
4. OTHER UTILITIES ARE NOT TO BE INSTALLED UNDER TRANSFORMER PAD.

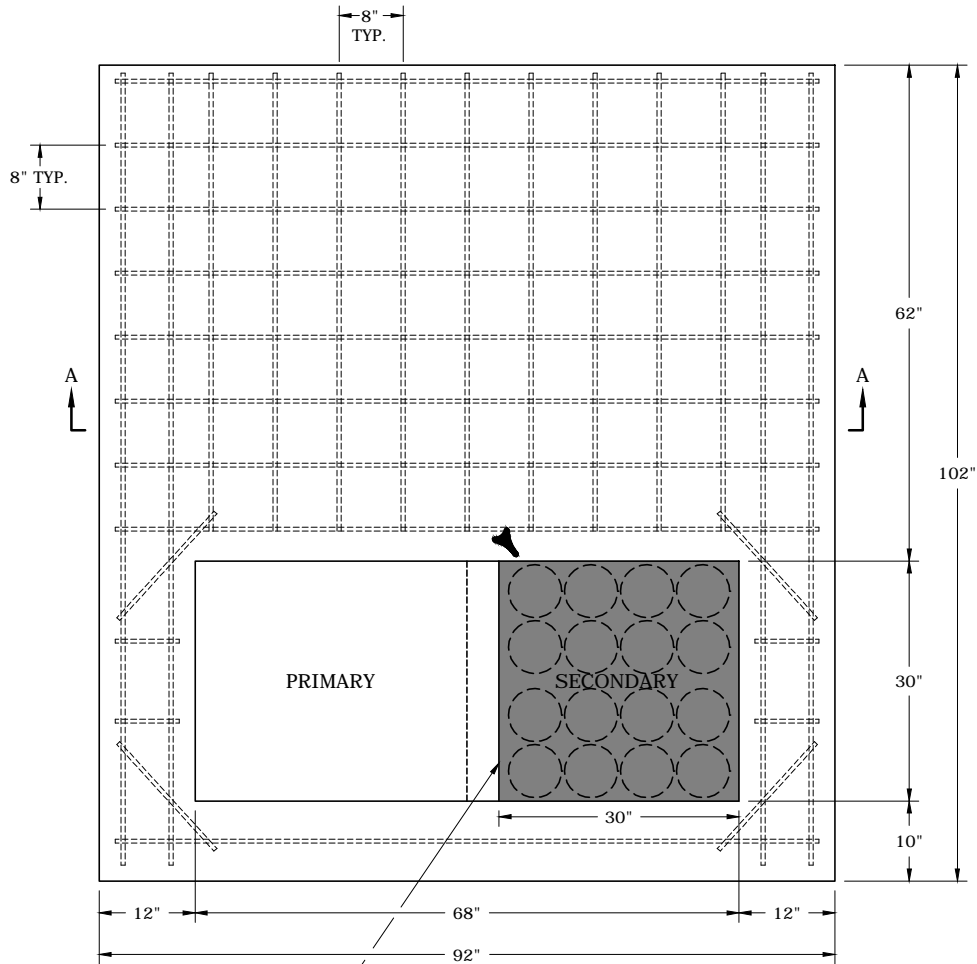


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0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

PRECAST PADS FOR THREE-PHASE,  
75KVA - 300KVA

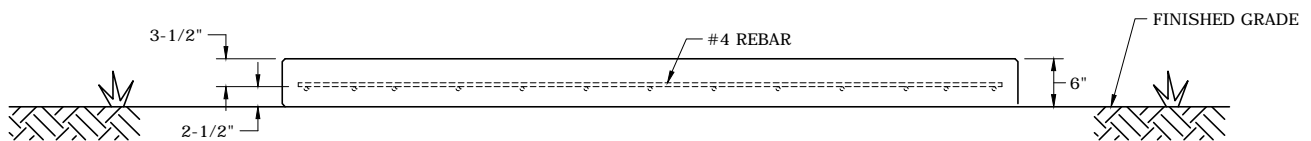
DEC	DEM	DEP	DEF
		X	

# APPENDIX C - PAGE 2



PLAN VIEW

ALL SERVICE CONDUITS TO BE WITHIN THIS 30" WIDE WINDOW. SEE NOTE 3.



SECTION 'A-A'

## NOTES:

1. TRANSFORMER PADS SHALL BE INSTALLED IN A LOCATION TO REMAIN READILY ACCESSIBLE FOR LINE TRUCKS. PADS SHALL HAVE A MINIMUM CLEARANCE FROM OBSTRUCTIONS AND BUILDINGS AS GIVEN IN FIGURE 52.
2. SOIL UNDERNEATH PADS SHALL BE FREE OF ROOTS AND OTHER ORGANIC MATERIALS AND BE THOROUGHLY TAMPED TO PREVENT WASHING. EXERCISE CARE IN BACKFILLING AND GRADING AROUND PAD.
3. SERVICE CONDUIT SHALL BE LOCATED IN THE EXTREME RIGHT SIDE OF THE SECONDARY COMPARTMENT. AND SHALL NOT EXTEND MORE THAN 30" LEFT OF THIS AS INDICATED IN THE ABOVE DRAWING.
4. OTHER UTILITIES ARE NOT TO BE INSTALLED UNDER TRANSFORMER PAD.



3				
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0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

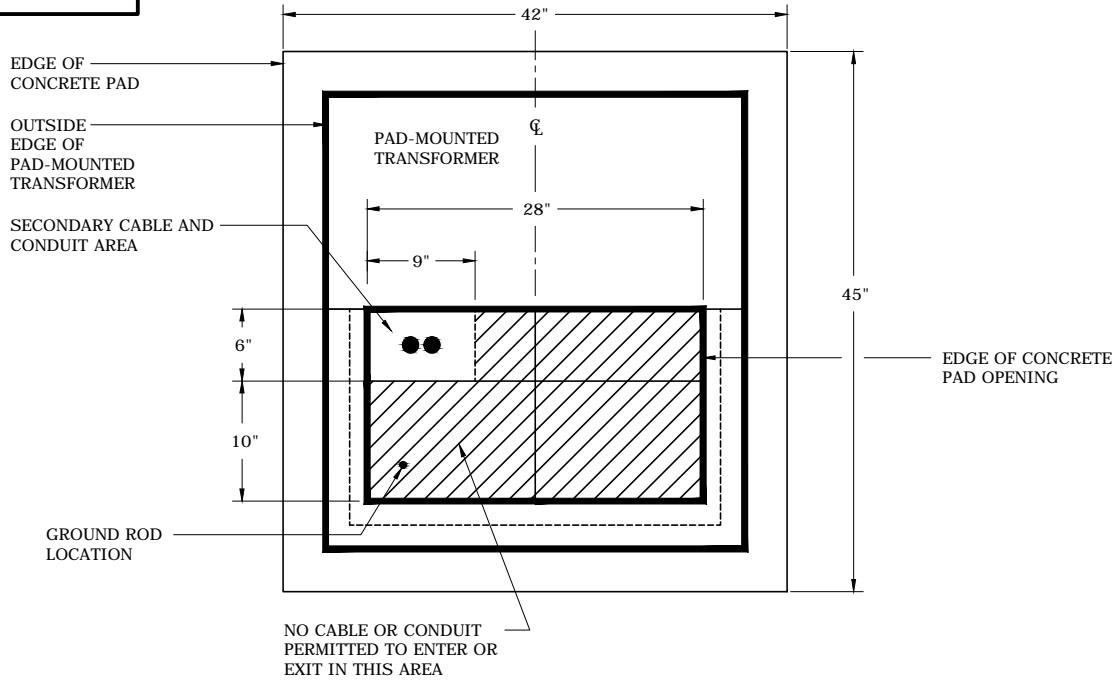
PRECAST PADS FOR THREE-PHASE,  
500KVA - 3750KVA

DEC	DEM	DEP	DEF
		X	

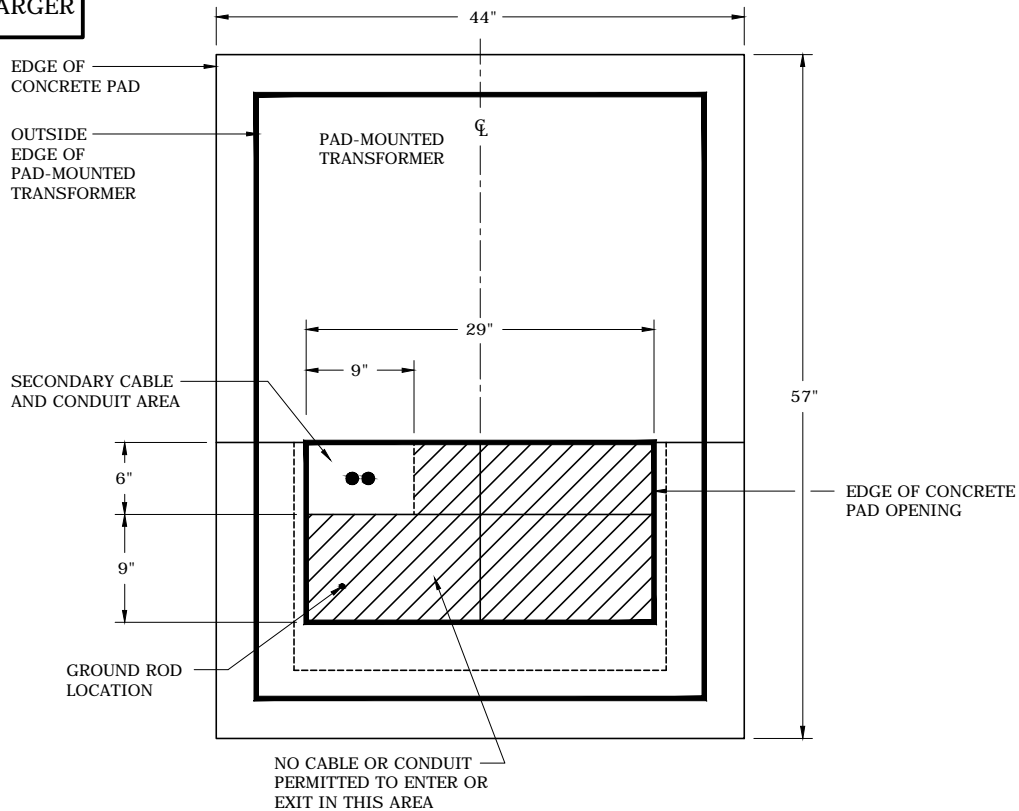


# APPENDIX C - PAGE 3

25-75 KVA



100 KVA AND LARGER



## NOTES:

1. ALL CONDUITS SHALL STUB-UP A MINIMUM DISTANCE OF ONE INCH (BUT SHALL NOT EXCEED 2") ABOVE THE TOP OF THE CONCRETE PAD.



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1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

CUSTOMER/SECONDARY CABLE AND CONDUIT ENTRANCE  
SINGLE-PHASE PAD-MOUNTED TRANSFORMER  
INSTALLATION (CONCRETE PADS ONLY)

DEC	DEM	DEP	DEF
		X	

## APPENDIX D (DEC ONLY)

THE LINKS BELOW WILL REFERENCE THE USER TO DOCUMENTS THAT DESCRIBE THE VARIOUS TYPES OF CONCRETE TRANSFORMER PADS USED WITHIN DEC, WHICH TRANSFORMER SIZES THEY ARE USED FOR, AND THE STYLE (FLAT OR PIT PAD) THAT IS APPROPRIATE FOR THE SIZE OF SERVICE. PLEASE NOTE THERE ARE TWO SEPARATE DOCUMENTS, ONE FOR THE DEC SERVICE AREA (EXCLUDING MECKLENBURG COUNTY) AND ANOTHER FOR USE WITHIN MECKLENBURG COUNTY ONLY.

ADDITIONALLY, CERTAIN PROVIDERS OF PRE-CAST CONCRETE PRODUCTS PROVIDE PRE-CAST VERSIONS OF THE "PIT PAD" DESIGN DESCRIBED IN THESE DOCUMENTS. DUKE ENERGY DOES NOT ENDORSE ANY SPECIFIC VENDOR VERSUS ANOTHER, BUT WILL INSPECT THESE INSTALLATIONS FOR THE SAME CONSTRUCTION STANDARDS AS PAD POURED IN PLACE.

[HTTP://DUKE-ENERGY.COM/PDFS/PADTRANSFORMERCONCRETEFOUNDSPESCS.PDF](http://duke-energy.com/pdfs/padtransformerconcretefoundspecs.pdf)

[HTTP://DUKE-ENERGY.COM/PDFS/PADTRANSFORMERCONCRETEFOUNDSPESCS-MECK.PDF](http://duke-energy.com/pdfs/padtransformerconcretefoundspecs-meck.pdf)



3				
2				
1				
0	11/20/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

### TRANSFORMER PADS

DEC	DEM	DEP	DEF
X			

## APPENDIX E (DEC & DEP)

<Date>

<Duke Energy Contact>

<Duke Energy>

<Street Address>

<City, State, ZIP>

Subject: Information Request for Arc-Flash Hazard Analysis

Dear <Duke Energy Contact>:

<Customer Name> would like to request that Duke Energy provide distribution protective device information for the purpose of performing a protective device coordination study. The information will be used solely for the purpose of a coordination study. It will not be used as part of an arc-flash hazard analysis. We would like the information provided for the following location(s):

**Business Name:**

**Address:**

**Meter/Account Number:**

<XXXXX>

<XX Street Name, City, State, ZIP>

<XXXXXX>

When the analysis has been completed, the information should be sent to

<Name>

<Address>

If you have any questions or need any additional information, please don't hesitate to contact me at <your office number> or via email at <your email address>.

Sincerely,

<Name>

<Title>



3				
2				
1				
0	11/23/15	SIMPSON	EANES	ADCOCK
REVISED	BY	CK'D	APPR.	

### ARC-FLASH HAZARD ANALYSIS REQUEST

DEC	DEM	DEP	DEF
X		X	