



*INFORMATION
AND GUIDANCE
FOR CUSTOMER
ELECTRIC SERVICE*

November 2009

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SUMMARY OF MAJOR CHANGES TO THIS DOCUMENT **(November 2008)**

1. Revised Table of Contents

Edit the headings and page numbers to match the revisions.

2. Revised Page 2 - Introduction

Insert the highlighted sentence for clarity:

The information contained within this Guide is supplementary to, and does not intentionally conflict with the National Electrical Code (NEC), the Company's current applicable tariffs, or such state and municipal laws and ordinances as may be in force within the states, cities, towns, or communities in which the Company furnishes electric service. It is always necessary to refer to and comply with state statutes, local ordinances, and the Company's standard rules and regulations on file with the public utility commissions. To the extent that any included information contradicts any terms in the Company's current applicable tariff, the tariff provision shall govern. This information is general and does not include every detail or every lawful requirement.

3. Revised Page 2 - Introduction

Insert the highlighted sentence and delete the last sentence for clarity:

From the Home page select the appropriate Operating Company from the Drop Down Box and then click on "Go", next click on the "Builder & Contractor" tab. ~~Appendices referenced but not detailed in this document are also available at the website.~~

4. Revised Page 2 - Definitions

For clarity resulting from recent Tariffs changes in some Regions, remove the last sentence:

Line Extension: A line extension is any addition to the Company's existing primary distribution lines and facilities that must be made to render electric service to a customer. ~~Typically, line extensions require customer contributions as defined by each Operating Company's Tariff.~~

5. Revised Page 8 - Disconnect/Reconnect of Existing Service (Upgrades)

For clarity resulting from recent Tariffs changes in some Regions, remove the first paragraph

~~Whenever a customer or electrical contractor requests the Company to perform a service disconnect/reconnect, both during and outside of the Company's normal work hours, there are fixed charges associated with this activity. These charges shall be payable to the Company through the customer's electric service account. There will charges for all Company disconnect/ reconnect work, including those activities that electrical contractors are not permitted to perform, as detailed below.~~

6. Revised Page 12 - General

Revise the following first two paragraphs as shown for clarity:

Based on an engineering evaluation, a Company representative will determine a pole, pad-mounted transformer, or handhole/pedestal location to which an underground service lateral can be extended.

Typically, the customer is responsible for the trenching, providing conduit where applicable, and backfilling. Refer to Exhibit 23 for trench details for direct buried cables. Since the actual trench dimensions may vary by soil condition, location, and other factors, it is necessary to confirm trench dimensions with the Company representative.

7. **Revised Page 12 - General**

Add the following new paragraph (after the fourth paragraph):

In situations where the customer owns and installs the underground service lateral, the contractor shall run the service lateral to within three feet of the designated Company pad-mounted transformer or handhole/pedestal or within six inches of overhead secondary for a vertical riser installation. (Caution: Facilities may be energized.) The contractor shall leave sufficient spare amount of coiled cable to complete termination of the cables – five feet for handholes/pedestals, ten feet for transformers, or five feet vertical risers. Refer to the appropriate Exhibit 19 or 20 to determine the party responsible for supplying the connectors to terminate the service lateral cable at the source end.

8. **Revised Page 13 - Underground Services in Underground Residential Areas**

Add reference to exhibits:

For single-phase customer-owned underground services at 400 amps or less, the customer shall install only one set of service cables sized for the expected load. Multiple or parallel sets of cables are not acceptable for services at 400 amps or less. Refer to Exhibits 6, 7, and 19.

9. **Revised Exhibits 6A and 7A (11/09)**

Revise the various roles that Toledo Edison and their customers make for these types of installations.

10. **Revised Exhibit 19D and 20D (11/09)**

Revise Note 3 as follows:

Because of recent Tariff changes, revise the various ownership roles that Toledo Edison and their customers make.

11. **New Exhibit 23**

Insert new exhibit to clarify customer Trench Details for Direct Buried Cables.

INTRODUCTION

- This Guide is for information and guidance to assist customers and their architects, engineers, and contractors in planning for and obtaining prompt electric service.
- The information contained within this Guide is supplementary to, and does not intentionally conflict with the National Electrical Code (NEC), the Company's current applicable tariffs, or such state and municipal laws and ordinances as may be in force within the states, cities, towns, or communities in which the Company furnishes electric service. It is always necessary to refer to and comply with state statutes, local ordinances, and the Company's standard rules and regulations on file with the public utility commissions. To the extent that any included information contradicts any terms in the Company's current applicable tariff, the tariff provision shall govern. This information is general and does not include every detail or every lawful requirement.
- The Company shall have the right to refuse to connect any wiring or installation that does not fully meet the above requirements, regulations, and rules. The Company shall also have the right to disconnect the wiring or installation of any customer violating any of such requirements, regulations, or rules. This action is not intended to imply that the Company undertakes any obligations to inspect the customer's wiring and electrical facilities, to assume any obligations, or to make any representations concerning their adequacy, safety, fitness for purpose, or other qualification. Nothing in the above Rules and Regulations or in this Guide shall be construed as imposing or undertaking such obligations or representations.
- All inquiries regarding service requirements should be directed to the Company's local Engineering Services Section. Inquiries regarding specific meter related requirements can be directed to the Company's local Meter Services Section.
- This Guide is subject to amendment from time to time, and will be re-issued on an as needed basis. It is the responsibility of the user to obtain the current version. The current edition of this Guide supersedes all previous issues and instructions.
- Significant changes to text from the last published version are identified in this document by a vertical bar in the outward margin (see example in the right margin). Changes to the exhibits are identified by small triangles pointing to the revisions. Note: These triangles point to changes made to the exhibits on the revision dates shown in the lower right corner of the exhibits.
- If you are looking at a paper copy of this document, the most current edition of this Guide is available on the Internet at <http://www.firstenergycorp.com>. [From the Home page select the appropriate Operating Company from the Drop Down Box and then click on "Go", next click on the "Builder & Contractor" tab.]

Comments, corrections, and suggestions regarding this document should be directed to FirstEnergy, Energy Delivery Operations Services Department, Distribution Design Standards Section at (800) 633-4766.

DEFINITIONS

Terms frequently used in this Guide are as defined below:

- **ANSI:** American National Standards Institute
- **Application for Service:** Application for service is a formal request submitted by the customer to the Company stating their desire to obtain electric service at a certain time and location. Applications may be processed by e-mail, telephone, or in-person.
- **Class of Service:** The characteristics of electric service described in terms of voltage, phase, frequency, and number of wires.
- **Clearance:** Clearance is a specified minimum distance between two objects (measured surface-to-surface) to assure adequate space for safety, security, or access.
- **Code:** The National Electrical Code (NEC), National Electrical Safety Code (NESC), or other electrical codes or regulations in effect in the area served.
- **Company:** Refers to the FirstEnergy Operating Companies (FEOC - Ohio Edison, The Illuminating Company, Penn Power, Toledo Edison, Jersey Central Power & Light, Penelec, and Met-Ed)
- **Customer:** The party using the Company's service, or in applicable cases, the property owner or developer or any party working on behalf of the customer such as a contractor or developer. The customer's electrical equipment is typically governed by the NEC.
- **Customer's Installation:** All wiring, conduit, meter socket, service disconnecting devices, appliances, lighting, and other equipment installed and/or owned by the customer on the customer's premises for the customer's use.
- **Distribution Lines:** Company lines medium voltage and below typically located in the public right-of-way in/or along streets, alleys, highways, or on private property for general distribution of electric service to customers.
- **High-Leg:** On a four-wire, delta-connected system where the midpoint of one phase winding is grounded to supply lighting and similar loads, the conductor or busbar having the higher phase voltage to ground shall be durably and permanently marked by an outer finish that is orange in color or by other effective means. Such identification shall be placed at each point on the system where a connection is made if the grounded conductor is also present. (Reference NEC 110.15 & 230.56)
- **Instrument Transformer:** Instrument transformer is a high quality transformer that accurately reproduces in its secondary circuit, a current or voltage in proportion to the current or voltage in the primary circuit.
- **Line Extension:** A line extension is any addition to the Company's existing primary distribution lines and facilities that must be made to render electric service to a customer.
- **Listed:** Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that the equipment, material, or services either meets appropriate designated standards or has been tested and found suitable for a specified purpose.

- **Meter:** Meter is a device for accurately measuring the electric power and energy consumed by a customer. The meter is supplied and maintained by the Company.
- **Mobile Home:** A mobile home is a manufactured home that complies with the mobile home definition in the NEC.
- **Point of Service:** That point where the Company's conductors or equipment connect to the customer's conductors or equipment of the facility
- **PUC/BPU/PSC:** The Public Utilities Commissions (OH, PA) / Board of Public Utilities (NJ) / Public Service Commission (NY).
- **Raceway:** A raceway is an enclosed channel for holding wires or cables.
- **Service:** The conductors and equipment for delivering energy from the Company's electric supply system to the wiring system of the premises served.
- **Service Drop:** A service drop is the overhead service conductors from the last pole or other aerial support to and including the connectors, if any, connecting to the service entrance conductors at the building or other structure.
- **Service-Entrance Conductors, Overhead System:** The service entrance for an overhead system is the group of service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.
- **Service-Entrance Conductors, Underground System:** The service entrance for an underground system is the group of service conductors between the terminals of the service equipment and the point of connection to the Service Lateral.
- **Service Equipment:** The necessary equipment, usually consisting of circuit breaker or switch and fuses, and their accessories, located near point of entrance of supply conductors to a building and intended to constitute the main control and means of cutoff for the supply to that building
- **Service Lateral:** The underground service conductors between the street main, including any risers at a pole or other structure or from transformers or handholes, and the first point of connection to the service entrance conductors in a terminal box, meter or other enclosure with adequate space, inside or outside the building wall.
- **Service Territory (electric):** Service territory is a defined area in which a given electric utility can legally provide service. The area is governed by a set of agreements and maps on file with the appropriate PUC/BPU/PSC.
- **Tariff:** The applicable Company tariff as filed with the New Jersey Board of Public Utilities, the Public Utilities Commission of Ohio, the Pennsylvania Public Utility Commission, or the New York Public Service Commission.
- **UL:** Underwriters Laboratories – an independent product-testing and certification organization

GENERAL INFORMATION

Availability & Character of Service

- The information contained in this booklet refers primarily to service requirements at the usual voltages for residential and general service installations. Service requirements for installations requiring higher voltages vary according to situation, and are not covered in this booklet except in "[Service at Voltages Greater Than Secondary \(Greater Than 600 V\)](#)". The Company's rules and the rules and regulations, as filed with the PUC/BPU/PSC, shall apply to the installation and use of the service furnished.
- Please ascertain from the Company, well in advance of the date actual service connection is required, whether or not service is available in the particular locality in question. If service is available, determine its exact character; that is, the voltage (such as 120/240 V, 208Y/120 V, or 480Y/277 V), single-phase, three-phase, network, etc., since these characteristics may vary in different localities. A 120-volt two-wire service is no longer available. These characteristics are especially important for the proper operation of motors and other major equipment. Normally, this information will be provided in writing from authorized Company personnel to avoid possible misunderstanding.
- The Company will, if requested, advise and assist present or prospective customers in the selection of electrical equipment, facilities, capacitors, protective coordination, and with information concerning rates.

Application for Service

- The customer should make applications for new, additional, or temporary service via the Internet or telephone to a Company office; **well in advance** of the date actual service is required. After the necessary customer information is received, the typical minimum time frames are as follows:

Residential Service Drop / Lateral	4 weeks
Residential Line Extension	8 weeks
Commercial/Industrial Drop / Lateral	10 weeks
Commercial/Industrial Line Extension	16 weeks

These recommendations will allow service to be established as near the desired time as practicable.

- The following information is required as soon as it is available to the customer. The Company cannot work on your job until the information is provided:
 1. Service address (including nearest intersecting roads),
 2. Lot number (and block number where applicable) and subdivision name,
 3. Tax district name (in PA and NJ),
 4. Contact persons (developer/architect, electrical contractor, etc) names, addresses, mailing addresses, and their telephone numbers,
 5. Owner name, address, mailing address, and telephone number,
 6. Person to be billed and the mailing address,
 7. Type of electric service required – overhead (OH) or underground (UG),
 8. Service voltage desired (e.g., 120/240 V single-phase, 208Y/120 V, or 480Y/277 V three-phase).
 9. Amp rating of the main(s)

10. If Residential: Determine heating fuel (oil, gas, electric, etc.), water heater fuel, electric range, air conditioning (size, if yes), total square feet, preferred electric meter location, and number of services. Also, determine if any other large or special electric loads (e.g., welder or kiln) will be used.
 11. If General Service (Commercial/Industrial): Electric load information (nameplate data) for all single-phase motors larger than 5 hp, three-phase motors larger than 10 hp, tons of air conditioning, kW process heat, kW lighting, kW computers, and any unusual loads.
 12. For Developments: An approved plot plan drawn to scale showing crossroads, proposed structures, wells, septic, decks, drives/parking areas, pools, ponds, preferred service route, planned major landscape changes and future development areas, and any other known or proposed obstructions that may interfere with the Company supplying electrical service.
 13. Date service wanted.
- Application for electric service can be handled by telephone as follows:

LOCATION	PHONE NUMBER
New Jersey – JCP&L	(800) 662-3115
Ohio – Illuminating Company Area	(800) 589-3101
Ohio – Ohio Edison Area	(800) 633-4766
Ohio – Toledo Edison Area	(800) 447-3333
Pennsylvania – Met-Ed Area	(800) 545-7741
Pennsylvania – Penn Power Area	(800) 720-3600
Pennsylvania & New York – Penelec Area	(800) 545-7741

- Application for electric service can be handled though the Internet by typing <http://www.firstenergycorp.com> and clicking on the appropriate Company link.
- The customer/developer shall stake the location of the proposed building, the lot lines, and driveway location so that decisions about service location can be made.

Line Extensions

- In order to avoid delay, persons desiring service beyond the existing electric distribution lines of the Company are advised to inquire of the Company the conditions under which service will be extended and make the necessary arrangements before wiring installations are commenced. Dependent on the situation and the nature of the facilities desired or required, the customer may be responsible for some of the construction and right-of-way costs (in Ohio, customers will be responsible for a percentage of the costs).

Number of Services & Meters

- The Company will connect only one set of service conductors to a building for each class of service rendered. If the building is occupied by one customer only one watt-hour meter for each class of service rendered will be installed except when the rate schedule under which the customer takes service states otherwise. If occupied by several customers, each customer will have one meter for each class of service rendered. Therefore, for each class of service, customers will be served with either single-phase or three-phase, but not both. All customer installations must conform to the NEC and local codes. Parallel runs of service cable extending from Company-owned equipment to multi-position meter centers should be avoided and require prior Company approval.
- If a second service is permitted based on the exceptions listed in Article 230.2 of the NEC, a permanent plaque or directory shall be installed at each service drop or lateral, or at each service equipment location. It shall denote all other services on or in that building or structure, and the area served by each.

Use of Service by Customer

- The customer's wiring and equipment including the meter socket will be maintained by the customer, at the customer's expense, in the condition required by the insurance and governmental authorities having jurisdiction.
- The service shall not be used in any manner that disturbs or impairs the operation of the Company's system or that will interfere with service to other customers. If such interference does occur, due to the use of apparatus installed upon a customer's premises, such customer must either discontinue the use of such apparatus or make the necessary revisions to the apparatus, including additional equipment that may be required to alleviate such conditions, or the Company shall have the right to discontinue the offending service.
- For proper service, the wiring on all single or three-phase installations should be arranged so that the load, to the extent possible, should be balanced among each phase-wire. This will minimize the amount of current carried on the neutral wire. For three-phase services, the load imbalance between phases shall not be greater than 15 percent of the kVA connected.

Interruption & Liability¹

- The Company will endeavor to furnish continuous service but does not guarantee uninterrupted service. The Company is not liable for any damage, which the customer may sustain because of the failure or partial failure of the energy, or failure or reversal of phases, or variation in service characteristics, whether caused by accident, or other causes. Nor is the Company liable for damage that may be incurred by the use of any service wiring, connections, instruments, services, or electrical appliances, installed by or for the customer. Nor is the Company liable for damage that may be incurred due to the presence of the Company's property on the customer's premises. It is the customer's responsibility to inform the Company of outages so that the outage can be expeditiously handled.

¹ To the extent this provision contradicts any terms in the Company's current applicable tariff, the tariff provision shall govern

Final Connections

- Residential/Commercial - All final connections for temporary or permanent service, between the Company's facilities and the customer's wiring, will be made by the Company. See Exhibits 19 & 20 to determine party responsible for supplying connectors. (Exception: In New Jersey and Met-Ed, in most cases, a licensed electrical contractor is allowed to perform a disconnect/reconnect of an overhead single-phase 200 amp and below service. Contact the Company for additional details.)
- The Company will assume no responsibility for changing the location of its service drop attachments if an improper location is chosen without consultation with the Company, or if the mutually acceptable location is not utilized.
- If, in order to comply with the requirements of governmental agencies or Codes as approved by ANSI, it becomes necessary for the Company to make any change in the location of its equipment or to change the character of its service, the customer will, at the customer's expense, make such changes in the customer's wiring, service entrance, and utilization equipment as are thereby made necessary.
- Service entrance equipment interrupting capacity shall meet or exceed the maximum available fault current. If necessary, contact the Company to determine the estimated available fault current. Contact the Company for the minimum required equipment rating.

Inspection

- Before initial service to a customer service location is energized, the Company should verify that the installation of the customer's meter base and associated equipment:
 1. has been inspected and approved by the local or state inspection authority, or
 2. in any area where there is no local or state inspection authority, has been inspected by a licensed electrician or Company representative, or
 3. in Pennsylvania, has been inspected and approved by personnel certified in accordance with the Uniform Construction Code (Act 45).
- When the Company deems that a hazardous condition exists, it may refuse to energize the customer's service until the customer complies with these requirements.
- In addition to complying with the National Electrical Code, the service shall be in accordance with the requirements of the Company and such state and local inspection requirements as may be in force at the time such installation is made.
- Service Restoration - Fire or Flood: If the meter or service entrance equipment has been subjected to fire or flood conditions, an inspection from the above referenced authority, and a release, when applicable, from a Fire Marshall or equivalent is required before service will be re-connected.
- Service Restoration – Disconnected Services: If a service has been disconnected (service wires cut or meter blocked) for 12 months or more, a new inspection by the local or state inspection authority is required before the service will be reconnected. In Ohio and New Jersey, in any area where there is no local or state inspection authority, or the local or state inspection authority will not perform the inspection for whatever reason, a licensed electrician must perform the inspection. The licensed electrician must provide the Company with a signed letter on the electrician's company letterhead stating that the service has been inspected.

Meter & Seal Tampering

- Tampering laws define tampering as interfering with, damaging, or bypassing a meter or service equipment to reduce the amount of electric service registered on the meter. Under the law, proof of tampering or reconnecting an electric meter is considered sufficient evidence that the customer caused the tampering or reconnected the meter. Violators of the law may be sentenced to jail and/or fined. In addition, violators must pay for the value of electricity consumed and the cost of repairs or replacement.
- Breaking of meter seals and/or removal of meters by customers, electrical contractors, or other unauthorized personnel, without prior Company permission, is prohibited and may be subject to penalties.

Meter Attachments

- No attachments by the customer or the customer's agent are permitted to Company-owned meters, meter circuits, or ancillary meter devices.
- The Company will supply, upon request by a customer, kWh and/or kvarh pulses from a Company-owned meter for demand control purposes. A cost will be assessed to the customer in accordance with specific Company charges for this connection.

Disconnect/Reconnect of Existing Service (Upgrades)

-
- The first step to be taken when upgrading or performing maintenance on an existing service is to contact the Company's Customer Contact Center. The Company must be informed of the necessity to break the meter seal, so that a Company representative can be scheduled to re-seal the meter after the work has been completed.
- For some service territories, a licensed electrical contractor who is upgrading or performing maintenance on a single-phase overhead service of 200 amps or less, and not changing the point of attachment, will be required to disconnect and reconnect to the Company's service drop, unless a two wire service drop is involved or other unusual circumstances exist. The connection must be made with permanent connectors. The Company recommends that all connections to the service drop, by the contractor, be made with compression connectors. Appropriate and properly applied mechanical connectors are also considered permanent. Verify with local inspection agency.
- All underground electrical upgrades must be inspected prior to reconnection.
- JCP&L has an "Agreement For Temporary Uninspected Service" (Form X-2904) which is applicable for single-phase overhead service less than 200 amps. This form provides a means by which a service can be re-energized before it has been inspected. This waiver cannot be utilized in conjunction with new, temporary, underground, or three-phase services, 320 amp, or greater services, nor for service restoration following a building fire.
- Electrical contractors will not be permitted to disconnect and reconnect to the Company's service drop for upgrades or maintenance involving the following:
 - Single-phase overhead services greater than 200 amps
 - Any overhead service where the point of attachment is being changed
 - Any overhead service drop that consists of only two wires
 - All overhead three-phase services

- All underground single or three-phase services
- When an electrical contractor is performing a disconnect/reconnect and a metal backed meter is encountered, the **metal-backed meter must not be reinstalled** due to a potential hazard. Contact the Company and a new meter will be furnished.
- The Company reserves the right to update meter and service locations at the time of upgrade for the purposes of applying current clearance requirements and meter location guidelines. Service equipment installed without approval or incorrectly located will be subject to change or relocation.

Locating Underground Electric Facilities

- State laws require that an excavator notify the One-Call System in advance of digging. Trained personnel will locate and mark underground facilities.
- To simplify the "*Call Before You Dig*" calling process, **8-1-1** has been designated by the FCC as a nation-wide telephone number. State utility commissions have issued rulings instructing local telecommunications companies to direct incoming **8-1-1** telephone calls through a voice activated answering system to the appropriate state One-Call system. Each State One-Call Center will retain their existing 800-telephone number and 8-1-1 will just serve as an additional method to contact the appropriate state One-Call Center. Note: In Ohio, the 8-1-1 number will transfer a caller to OUPS (see Item 1 below) but not to OGPUPS (see Item 2 below), which must be called separately.
- For projects in **Ohio**:
 1. Call the Ohio Utility Protection Service (OUPS) **at least 48 hours** but not more than ten days before digging. Call OUPS at (800) 362-2764 to request that a location be marked. Additional information can be obtained at their website: <http://www.oups.org>.
 2. In Ohio, you must also call the Ohio Oil & Gas Producers Underground Protection Service (OGPUPS). When you call them, they will give you a list of their members that you must individually notify of your planned excavation. Call OGPUPS at (800) 925-0988 or visit their website at <http://www.ogpups.com> to fill out an on-line form.
- For projects in **Pennsylvania**, call the Pennsylvania One-Call System **at least three (3) full working days** but not more than ten (10) days before digging at (800) 242-1776 to request that a location be marked. Their website can provide additional information: <http://www.paonecall.org>.
- For projects in **New Jersey**, call the New Jersey One-Call System **at least three (3) full working days** but not more than ten (10) days before digging at (800) 272-1000 to request that a location be marked. Their website can provide additional information: <http://www.nj1-call.org>.
- For projects in **New York**, call Dig Safely New York at (800) 962-7962 **at least two (2) days before digging** not counting the day of call to request that a location be marked. Their website can provide additional information: <http://www.digsafelynewyork.com>.

Required Clearance from Markout for Digging in the Vicinity of Company Underground Electric Facilities

- The Company prefers that an additional 12-inch separation be included beyond the state mandated 18-inch to 24-inch clearance (requirements vary by state and dimension of buried facility) from the markout stake, flag, or hash mark and the closest edge of any parallel trench dug by another party adjacent to the Company's underground facilities. Refer to [FE Distribution Engineering Practice 11-100](#) for more details.

TEMPORARY SERVICE

- Service entrance, meter, and other wiring on temporary indoor or outdoor installations are installed in the same manner as for permanent installations (except in New Jersey). In JCP&L service territory, temporary services may not be attached to buildings or mobile structures (trailers). When no building is available for the installation of service conductors and service equipment, it will be necessary to consult the Company's local office for recommendations as to suitable support for the service drop or termination of service lateral, meter, and weatherproof housing for the service equipment. See [Exhibits 1 and 2](#) for typical requirements for temporary service structures.
- See "Application for Service" Section for additional information regarding temporary service.
- Temporary services shall not exceed approximately six months except when associated with construction of a major facility.
- In Ohio, Penelec, and Penn Power, Company temporary structures are available. Contact Customer Service for further information.

PERMANENT SERVICE – OVERHEAD

General

- In order to avoid errors, it is essential that the customer, architect, or contractor ascertain from the Company the point of attachment for the service drop or the termination of the service lateral. As close as practical, the Company will designate a location for the point of attachment that is mutually acceptable to the customer and Company. The point of attachment will be located to provide the shortest practicable service drop distance to the Company's pole. The point of service is the connection of the overhead service drop to the customer's service entrance conductors/equipment.
- In general, service entrance conductors should be installed on the outside of the building to be served. If the service entrance conductors on the supply side of the meter are installed in rigid conduit without junctions or pull boxes, then the service entrance may be partially concealed.
- In situations involving parallel service entrance conductors, the Customer shall minimize the number of conductors to reduce both the electrical connections and the complexities inherent in such installations.
- See Exhibits 3, 3A, 4, 6A, 6B, 7A, 7B, 9, 11, 12, 14, 16, 17, and 22 for typical methods.

Service Drop Clearances

- The point of attachment of the service drop to the building must be such that the drip loop shall not be less than ten (10) feet above the ground. In addition, the point of attachment must be located to allow the Company to comply with the following NESC clearance requirements. The attachment should not be more than 24 feet above ground unless a greater height is necessary for proper clearances.
 - Twelve (12) feet above sidewalks and spaces accessible to pedestrians
 - Sixteen (16) feet above roads, streets, alleys, driveways and other areas subject to truck traffic (18 feet over PA state roads)
 - Two (2) feet above communication lines at any point of crossing, and one (1) foot at the point of attachment to the building
 - Three (3) feet between service drop conductors (attached to the buildings) and windows, doors, porches, and fire escapes
 - Five (5) feet between service drop conductors (not attached to the buildings) adjacent to windows, awnings, fire escapes and other building projections
 - Three and one-half (3.5) feet between service drop conductors and roofs of projections not accessible to pedestrians

Clearance of Trees from Power Lines

Trees & Transmission Rights-of-Way

- FirstEnergy's long distance, high voltage transmission lines provide power to thousands of our customers and are vital reliability links with other utilities across the country. Keeping our transmission rights-of-way free of unwanted trees and other vegetation is very important to providing reliable and safe electric service.
- All vegetation on or adjacent to the right-of-way shall be low-growing, compatible species. (For specific requirements in the State of New Jersey, see NJAC 14:5-9 et. al.).
- Additional information on correct tree selection can be found on the Company Internet site at: https://www.firstenergycorp.com/Get_Help_With/Safety/Maintaining_Trees_Near_Lines/Maintaining_Transmission_Rights-of-Way.html

Trees & Distribution Lines

- Tree related incidents are a major cause of electrical outages. Therefore, care must be exercised when planting trees to make certain that they will not interfere with distribution power lines, even when the trees reach full, mature growth. Trees that grow more than 25-feet tall should not be planted within 20 feet of distribution power lines.
- Additional information on correct tree selection can be found on the Company Internet site at https://www.firstenergycorp.com/Get_Help_With/Safety/Maintaining_Trees_Near_Lines/How_to_Select_the_Right_Tree_for_the_Location.html

Mobile Homes or Mobile Home Parks

- The Company has an established policy for extending service to mobile homes and will assist in planning the installation of mobile home parks. The Company's rules and regulations as filed with the State shall apply to the installation and use of the service furnished.
- Meter and service facilities for a mobile home or mobile home parks will be determined on a case-by-case basis.

- For non-subdivision type mobile home parks, the Company recommends a group meter arrangement (See [Exhibit 11](#) for typical methods). Mobile home park operators shall be responsible for the effective grounding of all mobile homes. Additional information is available upon request from the Company.

Travel Trailer or RV Parks

- Electric service requirements for travel trailer parks will be determined individually. Contact the Company for additional information.
- See [Exhibit 11](#) for typical method.

Central Pole Distribution Metering

- With the exception of New Jersey, an option for service to farms is Central Pole Distribution Metering. When this option is selected, the customer shall furnish, install, and own a pole centrally located with respect to the various buildings to be served. The central distribution pole in each case shall be a dead-end pole, as far as the Company lines are concerned, without any unmetered service extending beyond it.
- If it is impractical to serve all farm buildings from a centrally located pole due to distance between buildings or the necessity of crossing public roadways, the Company will provide services and meters for separate accounts for each building, as conditions require.
- See [Exhibit 9](#) for suggested methods.

PERMANENT SERVICE – UNDERGROUND

General

- Based on an engineering evaluation, a Company representative will determine a pole, [pad-mounted](#) transformer, or handhole/[pedestal](#) location to which an underground service lateral can be extended.
- [Typically](#), the customer is responsible for the trenching, providing conduit where applicable, and backfilling. [Refer to Exhibit 23 for trench details for direct buried cables. Since the actual trench dimensions may vary by soil condition, location, and other factors, it is necessary to confirm trench dimensions with the Company representative.](#)
- The customer is responsible for the trenching, conduit where applicable, and backfilling. In some cases, the customer is also responsible for the installation of the underground service lateral cable. See the applicable [Exhibits 19](#) and [20](#) for specific customer and Company installation/ownership responsibilities for each item associated with the service and for determination of point of service. The utility retains ownership of conductors and equipment it supplies. In special situations, if the point of service varies from [Exhibits 19](#) and [20](#), the customer's installation documents will clearly designate the equipment ownership and the exact point of service.
- History has shown that settlement of trench backfill has resulted in damage to service cable, meter sockets, and house siding. The NEC 300.5 (J) requires ground movement protection for direct buried cables. The Company recommends the use of a slip joint and slack box conduit product such as the Rizzcon Safety Slip to avoid such problems.
- [In situations where the customer owns and installs the underground service lateral, the contractor shall run the service lateral to within three feet of the designated Company pad-mounted transformer or handhole/pedestal or within six inches of overhead secondary for a vertical riser](#)

installation. (Caution: Facilities may be energized.) The contractor shall leave sufficient spare amount of coiled cable to complete termination of the cables – five feet for handholes/pedestals, ten feet for transformers, or five feet vertical risers. Refer to the appropriate Exhibit 19 or 20 to determine the party responsible for supplying the connectors to terminate the service lateral cable at the source end.

- In situations involving a customer installed and owned underground service lateral, if a customer increases the service lateral length or load, the customer is responsible to verify that ampacity, voltage drop, and voltage flicker limitations are suitable to serve the load. If load is being added, the customer shall advise the Company so that the Company can insure all Company associated facilities are adequate to serve the new load.
- There should be no fence, guardrail, wall, or other obstruction placed around pad-mounted transformers or handholes that would limit the Company from performing maintenance on the equipment or replacing it completely. This includes any tree, shrub, bush, or other vegetation that would have to be removed in order to operate, maintain, or replace equipment. The minimum clearance is three (3) feet from the back and sides, and ten (10) feet from the front of all pad-mounted equipment. Additionally, a customer shall not cover (even partially) any of these devices with mulch or dirt as this prevents them from being quickly located or safely operated as well as accelerating their corrosion.

Underground Services from Overhead Lines

- If at any time it becomes necessary for the Company to change the location of a pole upon which a customer owned underground service lateral terminates, the necessary changes in the service lateral will be made by the customer at the customer's expense. (This is applicable in Ohio Edison and generally applicable in Jersey Central Power & Light, Met-Ed, and Penelec. However, some exceptions may apply in certain cases involving State Highway widening projects.)
- See Exhibits 5A, 5B, 6A, 6B, 7A, 7B, 10, 11, and 12 for typical installations.

Underground Services in Underground Residential Areas

- In Pennsylvania, New York, and Ohio, the contractor, developer, or customer will provide all trenching and backfilling to Company specifications. In New Jersey, since trenching and backfilling obligations vary, contact the Company.
- In cases where the service lateral is installed by the customer, the Company will determine the pole, transformer, or handhole/pedestal location to which a customer owned underground service lateral can be extended. The service lateral cable shall be of sufficient length to allow the Company to complete the connections. If the customer increases the service lateral length or load, the customer is responsible to verify that ampacity, voltage drop, and flicker limitation are suitable to serve the load.
- For single-phase customer-owned underground services at 400 amps or less, the customer shall install only one set of service cables sized for the expected load. Multiple or parallel sets of cables are not acceptable for services at 400 amps or less. Refer to Exhibits 6, 7, and 19.
- For services greater than 400 amps, the customer must consult the Company as soon as possible during the building design stage to discuss the multiple or parallel cable service requirements.
- Due to connector physical limitations, cable size shall be limited to 600 kcmil when terminating in a pad-mounted transformer and 350 kcmil when terminating in a handhole.

Underground Services in Underground Commercial Areas

- The customer shall provide the Company with suitable space at a mutually acceptable location to accommodate the necessary transformation and switching equipment required to supply the customer's load. Space requirements will vary dependent on the customer's load and service requirements, as well as the availability of Company facilities in the area. It is therefore imperative that the customer contacts the Company at the earliest possible opportunity in the customer's electrical design stage to ensure that appropriate accommodations can be made for the required Company facilities.
- The Company will provide (install, own, and maintain) a pad-mounted enclosure, handhole, or other suitable means which can be used to terminate the service lateral cable.
- In those cases where the customer's building is located at the property line (Central Business Districts) and sufficient space is not available for necessary transformation and medium voltage switching equipment, the customer shall make provision to accommodate the necessary transformation and switching equipment at a mutually acceptable location inside the building wall. The Company's equipment must be accessible at all times. Special design requirements must be adhered to so that appropriate safety, maintenance, and operating conditions can be satisfied. Please consult the Company to obtain written approval from the Manager of Regional Engineering Services as soon as possible during the building design stage and to discuss any special needs and design specifications (Company, OSHA, NESC, NFPA, NEC, etc.). The Company will install, own, and maintain the necessary primary cable, transformer(s), and switchgear to provide electrical service.
- For those areas where the tariffs require the Company to own the primary or secondary service lateral cables and where the point of service is inside the building, the customer shall make provisions to terminate the lateral conductors at a mutually acceptable location. Special design requirements must be adhered to so appropriate safety, maintenance, and operating conditions can be satisfied. Please consult the Company as soon as possible during the building design stage to discuss requirements.
- For those areas where the tariffs require the customer to own the secondary service lateral cables, the customer with underground services at 400 amps or less, shall install only one set of service cables sized for the expected load. Multiple or parallel sets of cables shall not be acceptable for services at 400 amps or less, unless prior written agreement is made with the Company.
- For services greater than 400 amps, the customer must consult the Company as soon as possible during the building design stage to discuss the multiple or parallel cable service requirements.
- Where a service raceway or duct enters from an underground distribution system, the customer shall seal the end within the building with suitable compound to prevent the entrance of moisture (water) or gases. Spare or unused ducts shall also be sealed.
- See Exhibits 10, 15, 18, and 22 for typical installations.

Underground Services in Central Business District Network Areas

- All services shall originate from manholes or handholes. No service shall be energized directly from a transformer vault (Exception – spot networks at 480Y/277 V).

Transformer Foundations & Vaults

- Typically, it is required that the customer provides a suitable above ground external site to accommodate a pad-mounted transformer. The provided area shall be of sufficient size to

accommodate the installation, removal, maintenance, and upgrades in a safe manner. The customer shall provide the concrete transformer pad or foundation in accordance with regional specifications. If such a site is not available, a customer provided transformer vault might be used.

- When a transformer vault is necessary, said vault shall be furnished and maintained by the customer on the customer's premises at the customer's expense, in accordance with national, local, and Company requirements.
- Transformer vaults may contain only the supply transformers and associated primary equipment and, where necessary, customer-owned secondary bus. Under no conditions are service meters, customer-owned fuses, switches, or other customer -owned equipment to be installed therein. Secondary devices and service meters, however, are to be installed as near the transformer vault as practicable, but not in it.
- For certain high usage customers, current and voltage instrument transformers constitute a part of the Company's metering equipment. For distribution secondary voltages, they are usually installed in instrument transformer enclosures. For vaults in buildings, these enclosures are located outside the transformer vault, preferably on the vault wall, unless some other more desirable location is mutually agreed to by the customer and the Company. See [Exhibit 16](#) for a typical metering installation with current transformers.

Mobile Homes or Mobile Home Parks

- See [Exhibits 11](#) and 12 for typical methods.

MINIMUM REQUIREMENTS FOR ALL METER SOCKETS

<p>Meter sockets for a Service of 200 amps or less are supplied and installed by the customer. For other service sizes, see Exhibits 19 and 20 to see customer/Company responsibilities. All customer supplied meter sockets must meet the minimum requirements defined below. For Services 400 amps and greater, consult the Company for the appropriate metering equipment.</p>	
Minimum Requirements For All Meter Sockets	
Residential Single-Phase	Commercial Single & Three-Phase
<ul style="list-style-type: none"> ▪ Must be UL listed and labeled ▪ Meter socket jaws must be tin plated copper and spring supported ▪ Extruded aluminum tin plated ▪ Sockets must be 5th terminal adaptable (preferably @ 9 o'clock position) ▪ Sockets must be ringless type with clasp and slot closure. ▪ Must have bypass horns ▪ Must have ¼ inch ground wire knockout 	<ul style="list-style-type: none"> ▪ Must be UL listed and labeled ▪ Meter socket jaws must be tin plated copper and spring supported ▪ Extruded aluminum tin plated ▪ Sockets must be 5th terminal adaptable (preferably @ 9 o'clock position) ▪ Sockets must be ringless types with clasp and slot closure. ▪ Must have lever-operated jaw release and by-pass rated for 100% continuous duty. ▪ Must have ¼ inch ground wire knockout
<ul style="list-style-type: none"> ▪ Cardboard or plastic protector 	<ul style="list-style-type: none"> ▪ Cardboard or plastic protector
<ul style="list-style-type: none"> ▪ Must accept blanking plate 	<ul style="list-style-type: none"> ▪ Must accept blanking plate
<ul style="list-style-type: none"> ▪ Triple ground lug (triplex) 	<ul style="list-style-type: none"> ▪ Triple ground lug (triplex)
	<ul style="list-style-type: none"> ▪ All sockets must have the Landis & Gyr HQ Series, the Milbank HD Series, or the Eaton/Cutler Hammer MSL Series Block Assembly.
Additional Requirements For Specific Socket Types	
<p>Single-Phase Single Position Overhead 100 A & 200 A :</p> <ul style="list-style-type: none"> • Small hub opening (minimum) • Lug size - #6 AWG to 2/0 AWG (for 100 A) or #2 AWG to 350 kcmil (for 200 A) • Bottom knockout – 2½ inch conduit minimum • Hub not included 	

<p>Single-Phase Single Position Overhead 320 A :</p> <ul style="list-style-type: none"> • Large hub opening • Lug size - #4 AWG to 600 kcmil • Bottom knockout – 3 inch conduit minimum • Large hub opening • Bypass lever with jaw release
<p>Single-Phase Multiple Position OH/UG 125 A :</p> <ul style="list-style-type: none"> • Small hub opening (minimum) • Lug size - #6 to 2/0 AWG (load) and #2 AWG to 350 kcmil (line) • Bottom knockout – 3 inch conduit (for incoming utility cable) • Hub not included
<p>Single-Phase Multiple Position OH/UG 200 A :</p> <ul style="list-style-type: none"> • Large hub opening • Lug size - #2 AWG to 350 kcmil (load) and #6 AWG to 400 kcmil (line) • Minimum 2 inch conduit per position bottom knockout, additional bottom knockout – 3 inch conduit (for incoming utility cable) • Hub not included
<p>Single-Phase Multiple Position OH/UG 125 A with disconnect switch:</p> <ul style="list-style-type: none"> • Small hub opening (minimum) • Lug size - #6 to 2/0 AWG (load) and #4 AWG to 350 kcmil (line) • Bottom knockout – 3 inch conduit (for incoming utility cable) • Hub not included • Disconnect switch
<p>Single-Phase Multiple Position OH/UG 200 A with disconnect switch:</p> <ul style="list-style-type: none"> • Large hub opening • Lug size - #2 AWG to 350 kcmil (load) and 1/0 AWG to 600 kcmil (line) • Bottom knockout – 3 inch conduit (for incoming utility cable) • Hub not included • Disconnect switch
<p>Single-Phase Single Position UG 200 A:</p> <ul style="list-style-type: none"> • Lug size - #2 AWG to 350 kcmil • Bottom knockouts – two 3 inch conduits • Side wired

<p>Single-Phase Single Position UG 320 A:</p> <ul style="list-style-type: none"> • Lug size - #4 AWG to 600 kcmil • Bottom knockouts – two 4 inch conduits • Bypass lever with jaw release • Side wired
<p>Single-Phase Single and Double Position UG Pedestal 200 A:</p> <ul style="list-style-type: none"> • Lug size - #2 AWG to 350 kcmil • Stabilizing foot or base • A hasp for a padlock may be provided in place of barrel lock • Grounding provisions (if the pedestal is metal, it must be grounded to meter socket ground or have another method of grounding it) • 36 inch minimum below grade (including stabilizing foot or base) • Series main breaker
<p>Poly-Phase Single Position Self Contained OH 125A & 200 A:</p> <ul style="list-style-type: none"> • Small hub opening (minimum) • Lug size - #6 to 2/0 AWG (for 125 A) or #6 AWG to 350 kcmil (for 200 A) • Bottom knockout (min) – 2-inch conduit (125 A) or 3-inch conduit (200 A) • Seven-terminal three-phase four-wire
<p>Poly-Phase Single Position Self Contained OH/UG 320 A:</p> <ul style="list-style-type: none"> • Large hub opening • Lug size - #6 AWG to 600 kcmil • Bottom knockout – 4 inch conduit • Seven-terminal three-phase four-wire • Side wired
<p>Poly-Phase Single Position Self Contained UG 200 A:</p> <ul style="list-style-type: none"> • Lug size - # 6 AWG – 350 kcmil • Bottom knockout (min) – 3-inch conduit • Side wired • Seven-terminal three-phase four-wire

Three-Phase [Current Transformer Cabinets](#) (400 Amperes to 2,400 Amperes)

- Must be UL listed and labeled as a “Metering Transformer Cabinet”
- 14 gauge electroplated galvanized or equivalent gray painted steel (or aluminum with equivalent physical strength and corrosion resistance)
- Outdoor type must be weatherproofed
- Split door with stainless steel hinges (or equivalent hinges for aluminum cabinet)
- Padlockable handle on door with internal mechanism for three points of latching: top of door, bottom of door, and handle
- Each door must be equipped with a non-detachable door stop for holding it in a fixed open position
- Typical dimensions for cabinets rated 400 A to 800 A: 36-inch wide, 36-inch high, and 10-inch deep
- Typical dimensions for cabinets rated over 800 A to 2,400 A: 42-inch wide, 60-inch high, and 20-inch deep
- Removable copper bus bar on each phase for installation of window-type current transformers (Company will provide current transformer dimensions upon request)
- Each bus bar must be drilled and tapped on both ends with a 10-32 screw to facilitate connection of meter potential wires
- Bus support brackets on each phase must be spaced to accommodate installation of standard bar-type current transformers

Gangable Sockets

- Maximum height to center of top socket 72 inch
- Minimum height to center of bottom socket 24 inch (indoor), 30 inch (outdoor)
- Minimum spacing between meters 8 inch
- Plastic jaw guides
- Five jaw standard for three-phase in, single-phase out (for 120/208 V three-wire applications)
- 320 A units approved on a case by case basis
- Residential units – no bypass lever: Commercial units – bypass lever required
- A hasp for a padlock may be provided in place of barrel lock
- 480 V units must have disconnecting means on source side of each socket with provisions for meter seal and/or padlock

Metering Equipment Installation Guideline Summary
<ul style="list-style-type: none"> ▪ The Company shall approve all metering equipment locations.
<ul style="list-style-type: none"> ▪ The meter socket shall be mounted level.
<ul style="list-style-type: none"> ▪ Mount the socket on a solid part of the structure.
<ul style="list-style-type: none"> ▪ Use corrosion inhibited mounting hardware.
<ul style="list-style-type: none"> ▪ Do not mount the socket with nails.
<ul style="list-style-type: none"> ▪ Meter socket to be surface mounted. Do not build in or enclose the meter socket or meter within the structure.
<ul style="list-style-type: none"> ▪ Do not recess the meter socket in brick, masonry, or siding.
<ul style="list-style-type: none"> ▪ The installation shall meet the requirements set forth by the NEC and any local, state, or federal codes that apply to the installation. For installations that require electrical inspection, the inspection is required before the installation is connected to the Company's system.
<ul style="list-style-type: none"> ▪ It is recommended that a qualified electrical contractor perform all work on customer facilities.
<ul style="list-style-type: none"> ▪ Customer's meters, auxiliary devices, relays, etc., shall normally not be connected to the Company's metering circuits.
<ul style="list-style-type: none"> ▪ The Company will furnish the metering facilities required in accordance with its standard rate schedules.
<ul style="list-style-type: none"> ▪ After an installation is made, changes in location of meters for the convenience of the customer will be at the customer's expense, after the necessary service entrance wiring to the new location has been completed by the customer.
<ul style="list-style-type: none"> ▪ Only service entrance conductors may run through meter sockets or meter connection boxes.
<ul style="list-style-type: none"> ▪ Meter connection devices shall not be used as junction boxes.
<ul style="list-style-type: none"> ▪ All equipment furnished by the Company shall remain its exclusive property and the Company shall have the right to remove the same after termination of service for any reason whatsoever.
<ul style="list-style-type: none"> ▪ For identification purposes, it is necessary that wherever two or more meters are grouped at one location, all sockets/metering equipment (inside and out) and breakers must be plainly and permanently marked to designate the particular apartments, suites or offices served (e.g., Apt 1A). Likewise, the apartment or suite entrance(s) must be identified accordingly (e.g., APT 1A). Tags are the only means that have found satisfactory for marking entrance equipment or service or service conductors, whereas sockets or meter connection boxes may be marked by neat stencils with paint as well as by the use of permanent tags (label maker tags are not acceptable). These identification markings must be located as follows: <ul style="list-style-type: none"> ✓ Inside main electrical panel in the apartment or suite. ✓ Inside the meter socket near the jaw assembly. ✓ On the cover of both main panel and meter socket.
<ul style="list-style-type: none"> ▪ For multi-meter installations, any unmetered positions shall have the cardboard shipping covers replaced by plastic protectors.
<ul style="list-style-type: none"> ▪ Metered and unmetered conductors must not be in the same trough, conduit, or wireway.
<ul style="list-style-type: none"> ▪ For typical installations, see the <i>FIRSTENERGY INFORMATION AND GUIDANCE FOR CUSTOMER ELECTRIC SERVICE</i>, Exhibits 5, 8, 11, 12, 13, 14, 15, 16, 17, 18, and 22. In unusual cases, contact the Company.

Minimum Size Meter Socket - 480-Volt Services

- The smallest permissible size meter socket on 480Y/277-volt three-phase four-wire services is 200 amps.

Installations Requiring 320 Amperes & Less of Continuous Metering Load

- Typically on new installations or on existing installations where the service entrance conductors, service entrance panel, or main disconnect switch are rearranged, the meters will be installed outdoors. If an indoor installation is required, the Company shall be consulted before starting the installation.

Installations Requiring Over 320 Amperes of Continuous Metering Load

- The regional Meter Services Section will determine in each case (either new or to be rebuilt) the type of meter installation to be made.
- In Ohio, interval meters will be required for customers who select a Certified Supplier other than the regulated utility and have a maximum annual peak demand greater than or equal to 200 kW for the most recent twelve (12) month period, and for all customers whose expected load pattern does not match one of the Company's standard load profiles. Either the customer or the Certified Supplier shall provide, at its sole cost and expense, the installation, operation, and maintenance of the required compatible communication/telephone link(s) in order to transmit metered information from meters equipped for telemetry of metered data.
- Instrument transformers are required for these installations. In most situations, the customer will supply and install a current transformer cabinet or mounting facility in accordance with Company requirements. See [Exhibit 16](#). These instrument transformer cabinets are not to be used as junction boxes or raceways (troughs). Other alternative current transformer locations, as determined by the Regional Meter Services Manager or designee, may be applicable as per [Exhibits 17](#) or [18](#). All instrument transformer locations must be readily accessible to authorized Company representatives for checking and testing. However, before such an installation is made, the Company must be consulted regarding the meter location and facilities required.
- When the space above the instrument transformer cabinet is intended as the location for the meter or meters, it is necessary that adequate space be reserved for this purpose.
- Where the instrument transformer and/or service conductors are of such size that it is not practical to use instrument transformer cabinets, the current transformers may be mounted, at the customer's expense, in a bus structure. The current transformer compartment shall have a hinged lockable door. However, before such an installation is made, the Company must be consulted regarding the meter location and facilities required.
- For services exceeding 2,400 amperes, the customer shall provide a switchgear enclosure for metering. Switchgear compartments meeting ANSI C57.12.28 must be a minimum of 36"H x 30"W x 20"D with a bus separation of at least 10.5 inches on center, 7.5 inches minimum separation from the enclosure sides, and located on the supply side of any protective equipment. Bus dimension shall be a maximum of five (5) inch to allow for window type CT's. Contact the regional Meter Services Section for additional details and to determine if the nature of the installation allows for an alternative metering arrangement.

Approved Current Transformer Cabinets

- When a current transformer cabinet is required, the customer shall provide an approved unit from the table shown below. These cabinets shall not be used as junction boxes for circuit extensions and shall have line and load sides identified.
- All current transformers listed below are rated for indoor/outdoor use unless otherwise noted.
- The short-circuit current ratings that will be labeled on the current transformer cabinets are included next to the catalog numbers listed below. This information is being provided so that the customer can select a unit with a short-circuit current rating equal to or greater than the available short-circuit current at the cabinet as may be required by the local or state inspection authority.

<u>Manufacturer</u>	<u>CT Cabinet Catalog Number</u>	<u>Short-Circuit Current Rating</u>
Size: 600 - 800 Amp		
East Coast Panelboard	CTJ-800-A (indoor)	50,000 amps
	CTJ-800R-A (outdoor)	
Hoffman Enclosures	A800HCT1R	50,000 amps
Lake Shore Electric	JCTC-Series	50,000 amps
Meter Devices	507U7591-1	10,000 amps
Milbank	U5838-O	10,000 amps
Size: 1000 Amp		
East Coast Panelboard	CTJ-1000-A (indoor)	50,000 amps
	CTJ-1000R-A (outdoor)	
Erickson Electrical	CT-124-FECD	100,000 amps
Lake Shore Electric	MCTC-Series	50,000 amps
Size: 1200 Amp		
East Coast Panelboard	CTJ-1200-A (indoor)	50,000 amps
	CTJ-1200R-A (outdoor)	
Erickson Electrical	CT-124-FECD	100,000 amps
Lake Shore Electric	MCTC-Series	50,000 amps
Size: 1600 Amp		
East Coast Panelboard	CTJ-1600-A (indoor)	50,000 amps
	CTJ-1600R-A (outdoor)	
Erickson Electrical	CT-164-FECD	100,000 amps
Lake Shore Electric	SCTC-Series	100,000 amps

<u>Manufacturer</u>	<u>CT Cabinet Catalog Number</u>	<u>Short-Circuit Current Rating</u>
Size: 2000 Amp		
East Coast Panelboard	CTJ-2000-A (indoor)	50,000 amps
	CTJ-2000R-A (outdoor)	
Erickson Electrical	CT-204-FECD	100,000 amps
Lake Shore Electric	SCTC-Series	100,000 amps
Size: 2400 Amp		
East Coast Panelboard	CTJ-2500-A (indoor)	50,000 amps
	CTJ-2500R-A (outdoor)	
Erickson Electrical	CT254-FECD	100,000 amps
Lake Shore Electric	SCTC-Series	100,000 amps

Meter Location

- Outdoor
 1. All new outdoor meter installations shall be located on the building at the nearest practical point from Company facilities and readily accessible to authorized Company representatives. Clearance in front of and to the sides of meter sockets must be maintained as per NEC Section 110.26. The location should not be subject to severe vibration. Meters shall not be installed in locations where the meter readers or service personnel may inadvertently damage flowerbeds or shrubbery or where it will be necessary for them to climb over fences or other obstructions to read or service the meters. Additionally, they shall not be installed in locations where they may be accidentally damaged, such as on buildings where they will extend unguarded into alleys or driveways, or where they will cause inconvenience to the customer or the Company.
 2. Meters, located outdoors, should be placed so that the center of the meter socket will be five feet above final grade level. However, if it is necessary to locate a meter over a sidewalk or walkway, contact the Company.
 3. The customer must install steel concrete filled barrier posts to protect metering equipment where vehicle traffic may interfere with or damage such equipment.
 4. Meters shall not be located closer than three feet to any natural gas equipment. For LP gas installations, meters shall be no closer than 10 feet from tanks filled on site or five feet if tanks are not filled on site.
- Indoor (must be pre-approved by Regional Meter Services Manager)
 1. Where an indoor installation is required, the meters should be located on the first floor or in the basement where they will be readily accessible to authorized Company representatives. The location should not be subject to severe vibration, excessive dampness, high magnetic fields, or excessive heat and must be installed in accordance to the NEC.

2. In multiple occupancy (more than two occupancies) buildings, where several floors, apartments, stores, etc., are rented separately, meters and service equipment shall be located preferably all together. In high-rise buildings, it may be necessary to have several meter locations, possibly every other floor or every third floor as may be necessary.
 3. The meter room or space shall be readily accessible to all tenants and Company representatives at hours specified in accordance with the filed rates, rules, and regulations. This room shall be for the sole purpose intended and shall meet local fire codes as well as the NEC. This room shall not be used for the storage of materials or equipment.
- See [Exhibit 8](#) for typical indoor/outdoor installation for multiple occupancy

Service at Voltages Greater Than Secondary (Greater Than 600 V)

- General

Service at primary, subtransmission, or transmission voltage level may be available dependent upon the size of the load served, location of the facility, and other economic factors. Contact your local Engineering Services Section for additional information. Contact the Company well in advance of the time such service will be required so that the customer's and the Company's engineering, design, and construction work may be properly coordinated and equipment made available.

The Company will furnish and maintain one meter or one unified set of meters and metering equipment for each service contract. The customer shall provide, free of cost to the Company and close to the point of delivery, foundations and steel framework (where necessary), conduit runs, suitable space for the installation of meters, meter cabinets, instrument transformer enclosures, and other equipment. The instrument transformers for providing service shall be located near the terminus of the Company's supply facilities.

Customers electing to be metered at primary voltages shall provide at its sole cost and expense, the installation, operation and maintenance of a dedicated phone line for the retrieval of metered data for billing purposes.

Information pertaining to the installation and maintenance of meters and metering equipment and other equipment and apparatus is available from the Company upon request.

- Overhead Primary Service from Overhead Lines – 34.5 kV Wye & Below

Where overhead primary service is supplied, the Customer will install Company's supplied primary metering equipment on a customer-owned pole one span (80 feet maximum) away from the Company's facilities. The Company will furnish and install primary conductors for the span from the Company facilities to the metering pole and make the termination on the customer's pole. The Customer will also furnish and install a second pole and Company approved disconnecting and overcurrent protective devices disconnect, not more than one span away from the customer-owned metering pole. The Company will furnish information so that the interrupting ratings of the customer's equipment can be determined. The regional Engineering Services Section shall be consulted for coordination of the overcurrent protective device.

- Underground Primary Service from Overhead Lines – 34.5 kV Wye & Below

Where the primary metering is to be installed as described above, the customer's underground, primary service shall terminate on a customer-owned pole. The customer shall furnish and install all cable terminations and shall be required to furnish and install a Company approved disconnecting and overcurrent protective device on the terminal pole.

In New Jersey, whenever the installation of a customer-owned service will require excavation within State Highway right-of-way, a Utility Opening Permit must be obtained by the Company from the NJDOT. The Company will execute for the customer an "Agreement for Obtaining Utility Opening Permit." The customer will be required to pay the associated fee to the Company. The time required for the NJDOT to process a Utility Opening permit is approximately two months.

Pad-mounted & Cubicle Primary Service from Overhead Lines – 34.5 kV Wye & Below

Where pad-mounted or cubicle metering is to be installed, the Company will furnish and install the primary cable from the riser pole to the primary metering enclosure or compartment. Beyond the metering compartment, the customer shall install all cables and terminations from there to the line side of a Company approved disconnecting and overcurrent protective device. The Customer will provide and install the Company-approved primary metering enclosure for pad-mounted metering. Cubicle metering is acceptable if the customer provides the cubicle, plus detailed specifications of the metering section of the cubicle for approval by the regional Meter Services Section before installation; the Company will provide the current and potential transformers. Line and load side must be identified by the customer in all metering cubicles.

The location of the disconnecting and overcurrent protective devices shall not exceed ten (10) feet from the metering equipment; except for cubicle metering that is prebussed to the customer's switchgear. The Company shall make all primary terminations at the riser pole and the line side of the metering. The customer shall be responsible for all primary cables and terminations beyond the load side of the metering. The customer shall provide the trench as well as the backfill. In addition, the customer shall furnish and install all necessary conduits (with an approved pulling means), manholes, pull boxes, and a concrete pad for the metering equipment - all subject to Company approval. The Company will supply the meter-mounting device, for installation by the customer.

The Company will specify the required conduit diameter. A maximum of three (3) riser conduits shall be permitted on any single pole. Ten (10) feet of type TC2 schedule 80 PVC conduit must be provided for the riser, along with two 90-degree conduit sweeps at the base of the pole. The remaining conduit shall be type TC2 schedule 40 PVC; the 90-degree conduit sweeps at the metering and disconnect enclosures shall be schedule 40 PVC.

See above for permit requirements for customer-owned services that will be installed in New Jersey Department of Transportation rights-of-way.

- **Underground Primary Service from Underground Lines**

This type of primary service shall be similar to that described as above, except that the Company's primary service cable will originate at a manhole or pad-mounted switch instead of at a riser pole.

See above for permit requirements for customer owned services that will be installed in New Jersey Department of Transportation rights-of-way.

- **Indoor Cubicle Primary Metering**

Indoor cubicle metering may be approved by the Company for overhead or underground primary service. Consult the appropriate regional Meter Services Section for details.

- **Temporary Primary Service**

Where temporary primary service is required, the appropriate regional Engineering Services Section must be consulted for details since each installation will have different requirements.

- Subtransmission or Transmission Service

The Company may supply service at subtransmission or transmission voltage levels when required by special conditions, such as location and size or type of load. For specific requirements, consult the appropriate FEOC.

Customer-Owned Transformer Guidelines

- These guidelines are provided for use by customers who are required or desire to furnish their own transformers. Customers are advised to confer with local Company representatives while the installation is still in the design stage to verify source voltage, metering requirements, and the areas of their responsibility. It is also suggested that the customer review with the Company their proposed transformer specifications, construction details, and the coordination of protective devices.
- Customers owning their own transformers will be responsible for the purchase, installation, operation, maintenance, and replacement of such equipment and for any liability or damage claims arising from its ownership or use. Transformers shall comply with the applicable sections of Publication C57 of the American National Standards Institute (ANSI), and Publication TR1 of the National Electrical Manufacturers Association (NEMA). Transformers containing polychlorinated biphenyls (PCB) will not be acceptable.
- In general, customer-owned transformers will be of the "pad-mounted type" designed for ground level installation, although other types may be used with prior Company approval. When the Company's supply voltage is 4-wire wye, customer-owned three-phase transformers shall normally have Y-Y windings and single-phase units shall have the primary windings suitable for phase-to-neutral connection. If the Company's supply voltage is a 4-wire wye, but customer transformers must be connected delta on the high side, then a three-phase group operated switch must be installed ahead of the transformer(s). It is recommended that the customer's group operated switch operate automatically to prevent a single-phase condition. Units for operation at voltages other than listed above may be approved depending on local circumstances.
- The customer's equipment and installation must comply with all applicable provisions of the National Electrical Code (NEC). Particular attention should be given to Article 450, "Transformers and Transformer Vaults" and Article 230, "Services" specifically Part VIII, "Services Exceeding 600 Volts, Nominal." The customer is responsible for providing overcurrent protection and surge arresters for customer-owned transformers. This protection may consist of fusing supplied as an integral part to the transformer or as current-limiting fuses mounted external to the transformer. The customer must consult with the Company to ensure proper coordination of surge and overcurrent devices with Company equipment.
- The customer is also responsible for providing three-phase primary disconnecting equipment in accordance with NEC Article 230.205, "Disconnecting Means", the Company does not furnish primary disconnecting equipment, for operation by the customer, ahead of the customer-owned transformer.

- Before connection of service, the wiring on customer's premises must be inspected and the Company provided a Certificate of Approval issued by a recognized inspection agency or municipal inspection bureau (in New Jersey). All such Certificates of Approval shall state that the Customer's installation meets, at a minimum, the requirements of the latest revision of the National Electrical Code.
- In Pennsylvania, in case of primary service customers (over 600 volts), the Company may, at its sole discretion, in lieu of a Certificate of Approval by a recognized inspection agency or municipal inspection bureau, accept a letter of certification from a Registered Professional Engineer certifying that the electrical inspection on the customer's premises complies with all applicable codes.
- Metering, supplied by the Company, may be either located on the high voltage (primary) side, or low voltage (secondary) side of the customer-owned transformer at the option of the Company. When metering is located on the low voltage side, the customer's billing will be adjusted to reflect the transformer losses. If compensated metering is to be used, the customer must furnish transformer loss data. The Company will furnish the customer any information needed regarding character of service, coordination requirements, and installation suggestions.

Disconnect Requirements

- Central Business District Network Areas

The customer must provide a lockable (for Company padlock) disconnecting means with overcurrent protection (fuses) before entering the metering equipment on all underground services in Central Business District network systems.

- Multiple Meter Installations

Disconnect requirements on installations with multiple meters vary dependent upon the nature of the installation and level of load served. For disconnect (main and/or individual meter) requirements contact the regional Meter Services Section.

- 480 Volt Self-Contained Meter Installations

For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. The disconnecting means shall be installed, owned, and maintained by the customer. The disconnecting means must have provisions for a Company meter seal and/or padlock. See [Exhibit 22](#) for details.

For 480-volt multiple metering units (i.e., gang sockets), a disconnecting means is required on the source side of each socket as specified above for single meter installations. This requirement also applies to 480-volt multiple metering units having a main disconnect. See [Exhibit 8](#) for details.

The customer must contact the Company's Meter Services Section during the electrical design stage to discuss the 480-volt meter disconnect requirements and to obtain approval for the proposed installation.

CUSTOMERS' EQUIPMENT

Motors (Inrush Limitations & Motor Protection)

- Single-Phase Motors
 1. All single-phase motors with ratings of 1hp and larger should be connected for supply at 240 volts whenever it is practical, in order to minimize voltage fluctuation in the wiring system. Where service is supplied from a 208Y/120-volt system, these motors should be purchased for operation at 208 volts.
 2. Motor installations for air conditioning equipment, farm applications, and heat pumps in ratings of 1 to 7-1/2 hp should be of the capacitor start-capacitor run design. The Company shall be notified of each installation of five hp or more. In addition, for installations of air conditioning or heat pumps more than 3.5 tons, notify the Company.
 3. Overload protection must be provided for all motor circuits in accordance with National Electrical Code requirements.
 4. The use of automatic time-delay circuit breakers for circuit protection is strongly recommended and where fuses are used, they should always be of the time-delay type. This time-delay will, in many instances, prevent unnecessary shutdowns due to the tripping of an instantaneous type circuit breaker or blowing of ordinary short-time fuses by large currents resulting from motor starting, temporary overloads, or temporary low voltage conditions.

- Three-Phase Motors
 1. Before any three-phase motors are installed, it is advisable that the Company is consulted in order to determine the character and adequacy of the available service. The Company will endeavor to help its customers make the most economical installations possible in each case.
 2. Customers having three-phase service may install three-phase motors for service when the proposed installation will not increase the customer's connected load more than 20 percent. The Company should be notified if the connected load will be increased more than 20 percent so that the supply facilities may be increased if necessary.
 3. The Company shall be notified of each installation of 10 hp or more. The Company will provide the maximum permissible inrush for the location and for the conditions of that particular installation. Because of widely varying conditions in different locations, it is not possible to determine a general rule regarding the maximum value of starting currents that may be permissible for these larger motors.
 4. The use of reverse phase relays, phase failure relays, and low voltage relays, preferably of the adjustable time-delay type, with circuit breakers or equivalent devices, is highly recommended. These devices are desirable to automatically disconnect motors that cannot be safely reversed or would be damaged by a phase or voltage failure. Such devices are to be furnished, installed, and maintained by the customer at the customer's expense.

- Starting Currents – General

1. Motor starts can produce voltage fluctuations resulting in objectionable flicker on lighting supplied by the same or nearby circuits. Through industry standardization, starting currents of motors generally used in residential and small commercial applications have been established at values, which will not cause objectionable flicker under normal conditions (See Starting Currents - Intermittent Start Motors below).
2. Starting of large three-phase motors and operation of furnaces and welders requires special consideration of the power supply and wiring. The Company is prepared to assist the customer in planning these installations; and in every case, the Company must be notified so that adequacy of the service facilities may be determined and changes may be made if necessary.

- Starting Currents - Frequently Started Motors

Frequently started (more than four starts per hour) single-phase motors for general use, such as for refrigerators, oil burners, water pumps, and similar devices, should have a locked rotor current not exceeding 20 amperes for operation at 120 volts and 25 amperes for operation at 240 volts. These motors are permissible on the system.

- Starting Currents - Intermittent Started Motors

1. Single-phase motors for installations such as heat pumps, central air conditioners, grain dryers, etc., with locked rotor currents not exceeding 175 amperes served at nominal 120/240 volts or network 120/208Y volts, may be connected to the single-phase lighting service furnished through one meter.
2. Motors having starting currents exceeding the limits stated in "Starting Currents - Frequently Started Motors" and in item (1.) of Intermittent Started Motors) above should not be installed without the consent of the Company.
3. The maximum permissible motor starting currents, as indicated in item (5.) below, shall apply to the application of manually or infrequently started motors. These values are based on not more than four starts per hour with long periods of continuous operation under maximum load conditions.
4. Where equipment ratings or inrush characteristics other than those covered in this section are being considered, the Company must be consulted. The starting currents permitted will depend upon the frequency of start of the motor, the size and character of the customer's load, and the capacity of the Company's system in the area. The maximum allowable starting current will be that value which in the Company's opinion can be supplied without causing undue interference with service to other customers.

5. Maximum Permissible Motor Starting Currents

a. Equipment with Motors Rated in Horsepower

<u>Equipment Rated at</u>	<u>Total Locked Rotor Current Not to Exceed</u>
120 volts, single-phase	70 amps
230 volts, single-phase	
Two hp or less	60 amps
Two hp to 6.5 hp	60 amps plus 20 amps/hp over 2 hp
Over 6.5 hp	Consult the Company.
208 or 240 volts, three-phase*	
Two hp or less	50 amps
Two hp to 19.9 hp	50 amps plus 14 amps/hp over 2 hp
Over 19.9 hp	Consult the Company.

b. Room and Unitary Air Conditioning or Heat Pump Equipment Rated in Btu per Hour (Btu/h).
Note: 12,000 Btu/h equals one ton.

<u>Equipment Rated at</u>	<u>Total Locked Rotor Current Not to Exceed</u>
120 volts, single-phase	50 amps
208 or 240 volts, single-phase	
20,000 Btu/h or less	60 amps
20,000 Btu/h to 43,333 Btu/h	60 amps plus 3 amps/1000 Btu/h in excess of 20,000 Btu/h
Over 43,333 Btu/h	Consult the Company
208 or 240 volts, three-phase*	
20,000 Btu/h or less	50 amps
20,000 Btu/h to 50,000 Btu/h	50 amps plus 2.5 amps/1000 Btu/h in excess of 20,000 Btu/h
Over 50,000 Btu/h	Consult the Company

* Three-phase supply is not available for residential service (except as provided for in Toledo Edison's Tariff.)

6. Definitions & Notes for Motor Starting Requirements

- a. Total locked rotor current is defined as the steady state current taken from the supply line with the motor rotor or rotors locked, with all other power-consuming components, including a current-reducing starter if used, connected in the starting position, and with rated voltage and frequency applied.
- b. Where the equipment contains more than one motor and some motors are arranged for sequence starting, locked rotor current applies to that combination of power-consuming components simultaneously started that produces a higher draw of starting current than any other combination. In such sequence arrangements, the subsequent motor(s) shall not be started for a minimum of 1/2 second after the preceding motor(s) have completed their starting mode.

- c. Where the design of the equipment is such that unequal currents appear in the supply wires (i.e., auxiliary motors on single-phase equipment or single-phase auxiliary motors on three-phase equipment), locked rotor current applies to the supply wire carrying the largest current.
- d. For three-phase motors and equipment rated at voltages other than 240 volts, the locked rotor currents specified shall be multiplied by the inverse ratio of the voltages [For example, for a 480-volt motor, the locked rotor current would be the value in the table in item (5) above multiplied times the ratio 240/480 (0.5)].

Power Factor

- It is desirable to maintain the power factor of any load as near unity as possible.
- The Company shall not be obligated to furnish service when the power factor is not maintained at or above the level specified in the tariff. In general, the customer power factor must be a minimum of 85 percent or higher. If power factor corrective equipment is necessary, it, together with required switching equipment, shall be provided and maintained by the customer at the customer's expense.
- In general, capacitors must be applied more carefully than most types of electrical equipment in order that satisfactory operation and maintenance will result. The customer should consult with the Company before any installations of this type of equipment are made.

Welders & Industrial Furnaces

- The Company is prepared to assist its customers in planning installations of electric welders and industrial type furnaces. In order to have ample time to determine the electrical supply requirements, it is essential in every case that the Company is consulted when such installations are being planned and before the customer commits to the purchase of the equipment.

Commercial Cooking, Space Heating, Water Heating, & Ice / Snow Melting

- In some instances, installations of commercial cooking, space heating, water heating, ice and snow melting, and similar equipment require additional service capacities for satisfactory operation. Before any such installations are made, consultation with the Company is advisable.

Special Equipment

- It is also necessary that the installation of any special equipment not covered in this section be referred to the Company for advice before any commitments for purchase or installation are made. Such special equipment shall include X-ray, induction and dielectric heating equipment, sign flashers, compressors or radio transmission rectifiers, and other similar devices

Low-Voltage Surge Arresters (750 Volts or Less)

- When low-voltage surge arresters are installed by the customer, they shall not be connected to the service drop conductors, nor to the service entrance conductors, and they shall not be installed in the meter socket. Where installed to protect utilization equipment, low-voltage surge arresters may be either inside or outside the enclosure containing the equipment to be protected or installed at the service equipment. These arresters should never be considered as taking the place of the bond between the neutral or grounded conductor and the metallic systems at ground potential such as: metallic siding, water, waste lines, central heating, television towers and antennas, and sometimes lightning rods, but only as devices which may help to reduce appliance failures.

UPS, Cogeneration, & Back-up Generation

- It is necessary to consult with the Company before considering or commencing design of such a system, due to the potential safety hazard involved. In addition, if generation can run in parallel with the Company supply system; obtain additional information on interconnection requirements from the Company's local Engineering Services Section. It is specifically prohibited to operate generation in parallel with Company facilities unless the Company has approved the interconnection design.
- When installing emergency generators, customers shall employ a switch that will prevent electrical backfeed onto Company facilities when the generator is in operation.

Harmonic Producing Equipment

- Customers shall meet the requirements of IEEE Standard 519 Section 10, Recommended Practices for Individual Customers. Typical examples of harmonic producing equipment are rectifiers, SCR drives, power supplies, inverters, arc-furnaces, welders, etc.

Protective Devices

- The Company will supply necessary information relative to the required interrupting capacity of protective devices to be installed at any definite location on the Company lines. Where service is supplied from high capacity systems, special fuses or breakers of high interrupting capacity shall be used. This is of particular importance where protective devices are to be installed in underground secondary network Central Business District and high voltage systems. While the Company will endeavor, where possible, to anticipate system changes which may affect these values, it does not assume responsibility or liability with respect to such protective devices, nor guarantee their continuing adequacy against increased interrupting capacity requirements resulting from system changes.
- The service equipment installed, irrespective of type, should be of such capacity as to permit the full utilization of the capacity of the service entrance conductors installed at the time of the original installation. Circuit breaker type service equipment is preferable in all cases, and its use is strongly recommended. However, fused type equipment is also acceptable.
- Protection against loss of voltage, voltage unbalance, undervoltage transient, sustained overvoltage, phase reversal, loss of synchronism, overcurrent, short circuit and single phasing is highly recommended for three-phase equipment and is the responsibility of the Customer. Reverse phase relays must be provided on three-phase motors for elevators, cranes, hoists, or any other equipment requiring constant direction of rotation, where reversal of power would result in damage to the equipment.

GENERAL NOTES APPLYING TO EXHIBITS

Every installation of customer facilities shall be sized and rated per National Electrical Code requirements for its applications. Specifically, grounding shall meet National Electrical Code, Article 250. Customer is responsible to determine when additional ground rods are required.

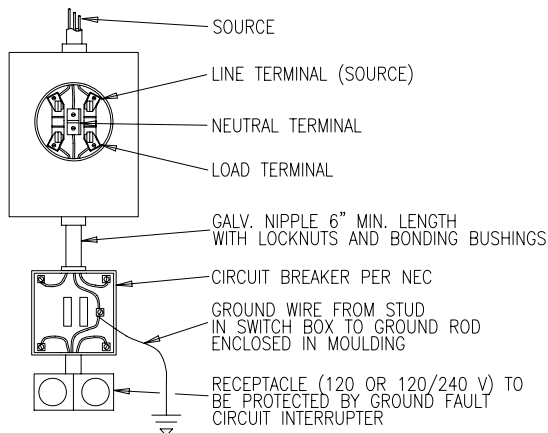
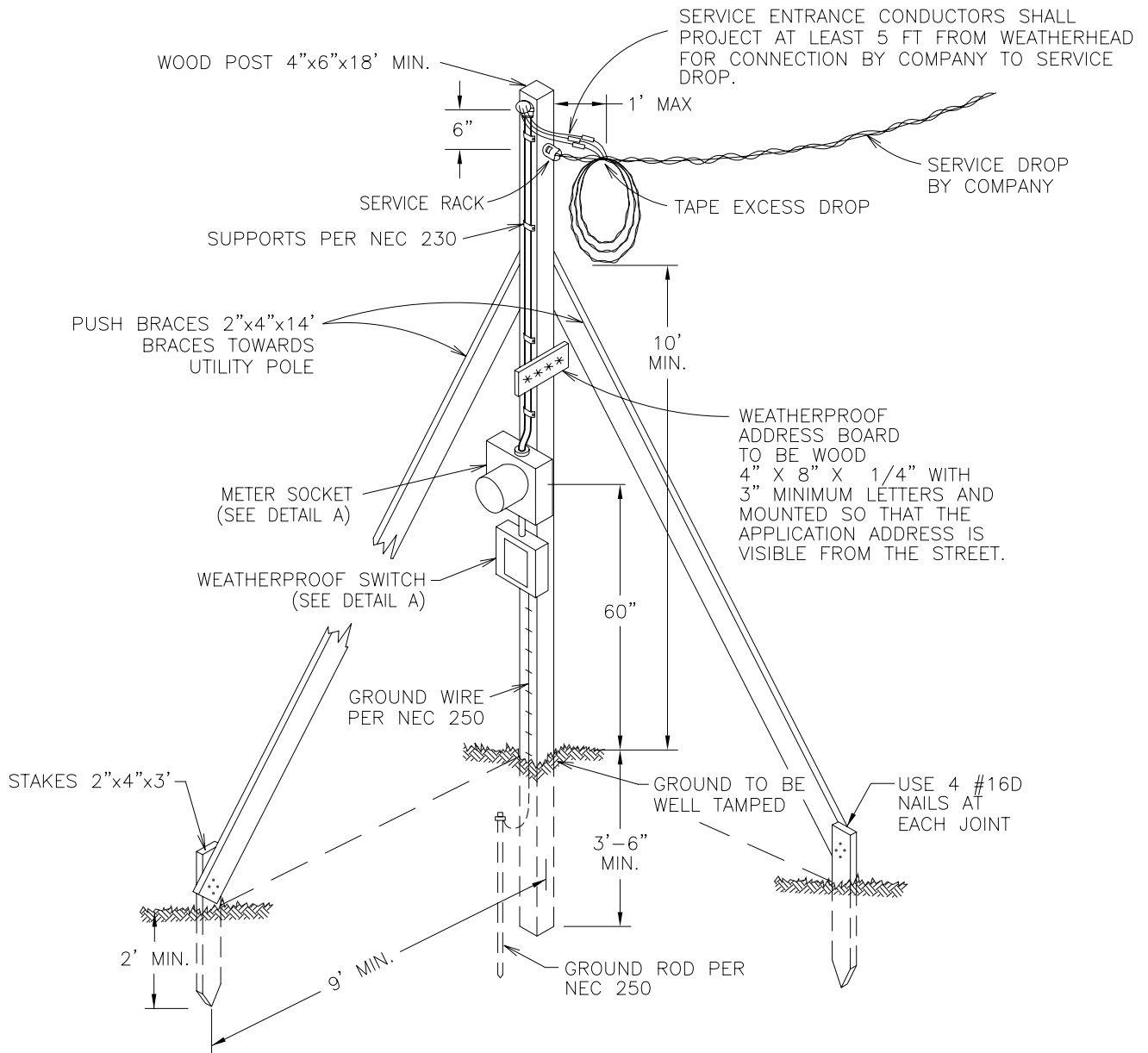
Meter sockets and cabinets may be connected to an external ground rod if required by the local authority having jurisdiction.

Check with local authority having jurisdiction for permit and inspection requirements.

Self-contained meter sockets on commercial accounts must have a lever operated jaw release and bypass.

Customer or contractor is responsible to provide and install the overhead service attachment to the structure. (See [Exhibit 3A](#))

Comments, corrections, and suggestions regarding this document should be directed to FirstEnergy, Energy Delivery Operations Services Department, Distribution Design Standards Section at (800) 633-4766.



3 WIRE 120/240 VOLT CONNECTION DIAGRAM

DETAIL "A"

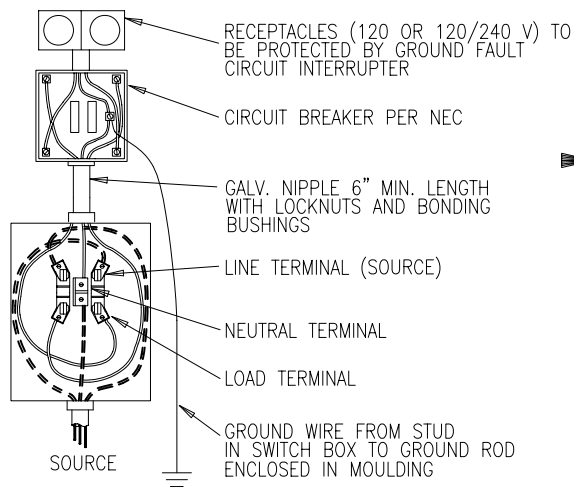
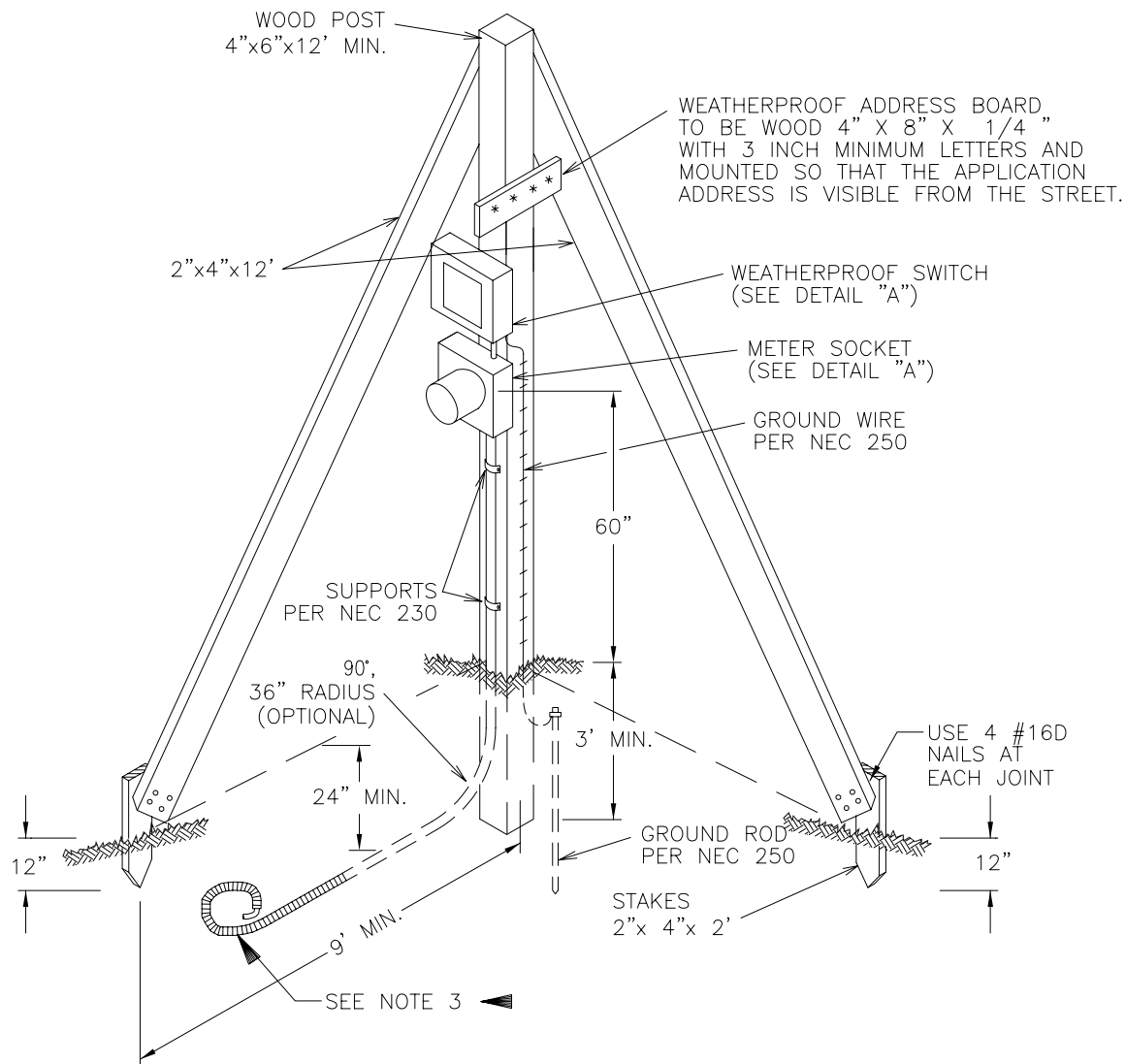
NOTES:

1. THIS STRUCTURE IS FOR TEMPORARY SERVICE OF SHORT DURATION ONLY, TYPICALLY 6 MONTHS.
2. SERVICE DROP CLEARANCE ABOVE ALL DRIVEWAYS, ALLEYS, PARKING LOTS AND AREAS SUBJECT TO TRUCK TRAFFIC, SHALL BE IN ACCORDANCE WITH NESC. MINIMUM GROUND CLEARANCE OF 10 FT TO THE BOTTOM OF THE DRIP LOOP IS REQUIRED PER NEC.
3. GROUND FAULT PROTECTION SHALL MEET THE NEC 305.
4. COMPANY WILL CONNECT SERVICE UPON RECEIPT OF FEE AND INSPECTION RELEASE.
5. ALL WOOD PRODUCTS TO BE PRESSURE TREATED.
6. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.
7. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
8. FOR INSTALLATIONS WITHIN 30 FT OF A 50 KVA OR LARGER TRANSFORMER, CONTACT COMPANY REPRESENTATIVE FOR AVAILABLE FAULT CURRENT.
9. POLE & TEMPORARY SERVICE PLACEMENT SHALL BE APPROVED BY THE COMPANY.
10. CALL STATE ONE CALL AGENCY 3 DAYS BEFORE CONSTRUCTION.

TEMPORARY SERVICE OVERHEAD INSTALLATION

FirstEnergy

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EXHIBIT 1	DATE
	8/08



3 WIRE 120/240 VOLT CONNECTION DIAGRAM

DETAIL "A"

NOTES:

1. THIS STRUCTURE IS FOR TEMPORARY SERVICE OF SHORT DURATION ONLY, TYPICALLY 6 MONTHS.
2. BASE OF TEMPORARY SERVICE POLE MUST BE A MINIMUM OF 3 FT FROM FOUNDATION.
- ▶ 3. CONTRACTOR TO RUN SERVICE LATERAL CABLES TO COMPANY HANDHOLE OR TRANSFORMER. CONTRACTOR TO LEAVE 5 FT COIL OF CABLE FOR HOOK-UP AT HANDHOLE OR 10 FT COIL FOR TRANSFORMER. CABLE MUST BE EITHER 3-CONDUCTOR WITH GROUND OR 2-CONDUCTOR WITH GROUND CABLE WITH THE WHITE WIRE PERMANENTLY MARKED AS HOT PER NEC 310 AND 200. "TAPE IS NOT APPROVED" FOR MARKING 2-CONDUCTOR CABLE.
4. GROUND FAULT PROTECTION SHALL MEET THE NEC 305.
5. ALL WOOD PRODUCTS TO BE PRESSURE TREATED.
6. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.
7. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
8. FOR INSTALLATIONS WITHIN 30 FT OF A 50 KVA OR LARGER TRANSFORMER, CONTACT COMPANY REPRESENTATIVE FOR AVAILABLE FAULT CURRENT.
- ▶ 9. POLE & TEMPORARY PLACEMENT SHALL BE APPROVED BY THE COMPANY.
10. CALL STATE ONE-CALL AGENCY 3 DAYS BEFORE CONSTRUCTION.

TEMPORARY SERVICE UNDERGROUND INSTALLATION

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Service Guide

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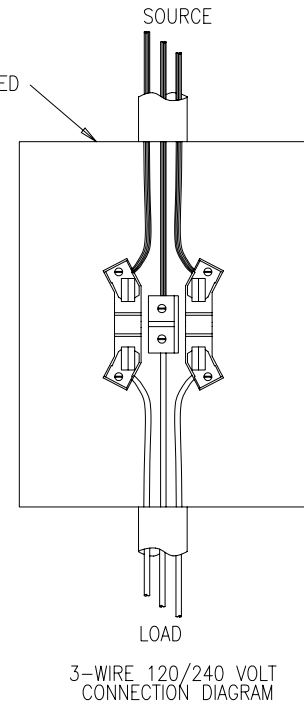
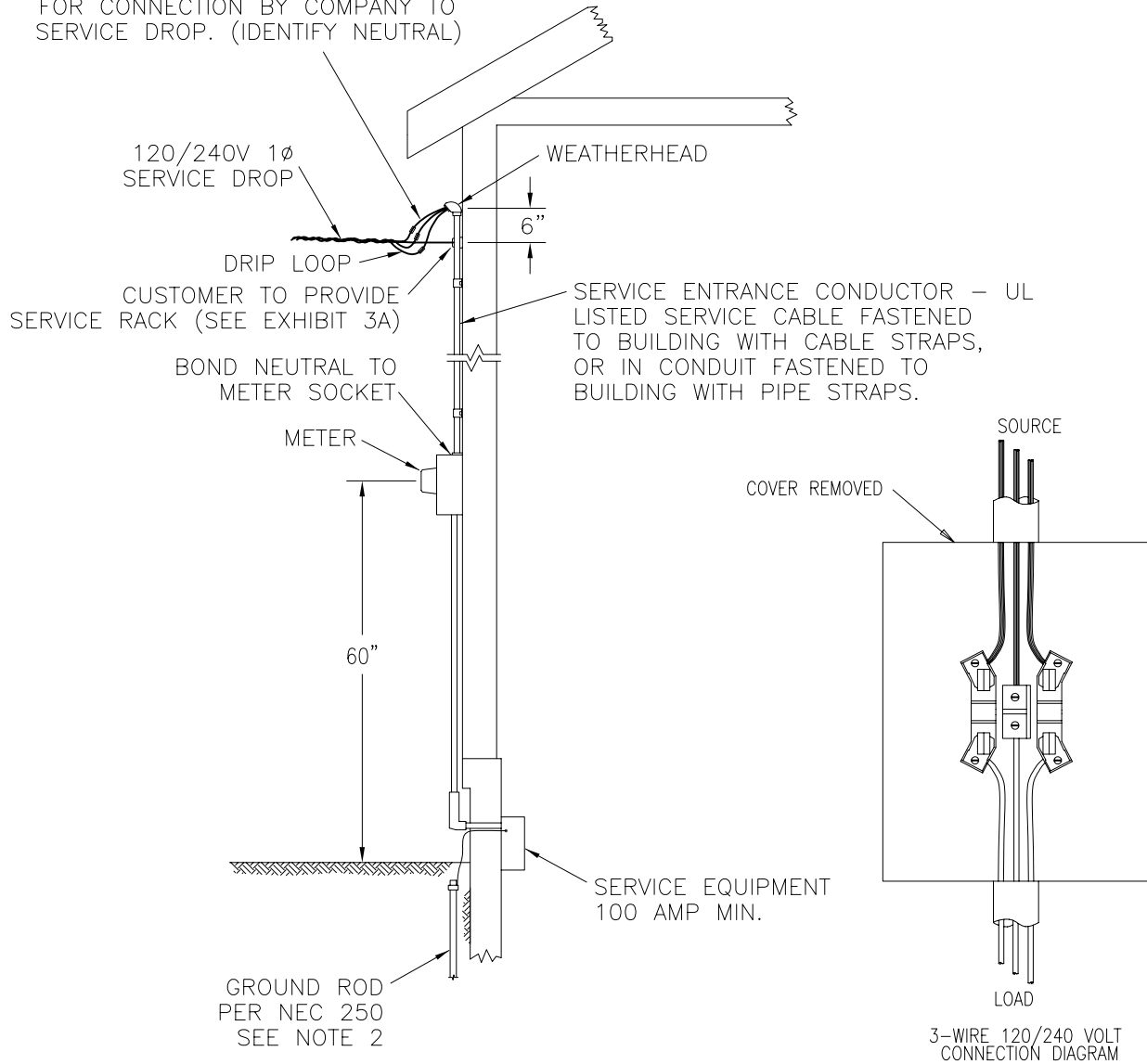
EXHIBIT 2

4

DATE

10/08

SERVICE ENTRANCE CONDUCTORS SHALL PROJECT AT LEAST 5 FT FROM WEATHERHEAD FOR CONNECTION BY COMPANY TO SERVICE DROP. (IDENTIFY NEUTRAL)



NOTES:

1. SERVICE DROP CLEARANCES ABOVE GRADE, ALLEYS, DRIVEWAYS, AND AREAS SUBJECT TO TRUCK USE, SHALL BE IN ACCORDANCE WITH NESC. MINIMUM GROUND CLEARANCE OF 10 FT TO THE BOTTOM OF THE DRIP LOOP IS REQUIRED AS PER NEC.
2. MINIMUM GROUNDING REQUIREMENTS PER NEC 250. METER SOCKET(S) MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
3. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

**OVERHEAD SERVICE
RESIDENTIAL ENTRANCE INSTALLATION**

FirstEnergy.

Service Guide

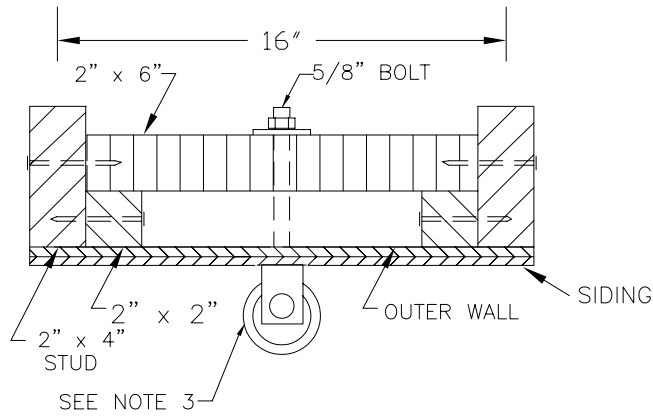
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EXHIBIT 3

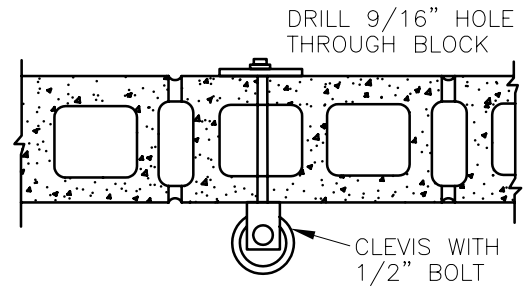
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8/06

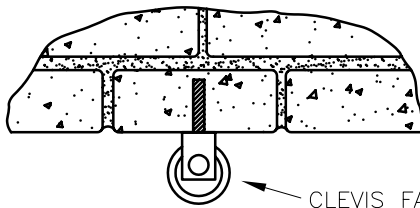


WOOD, ALUMINUM, OR COMPOSITION SIDING



CINDER OR CEMENT BLOCK

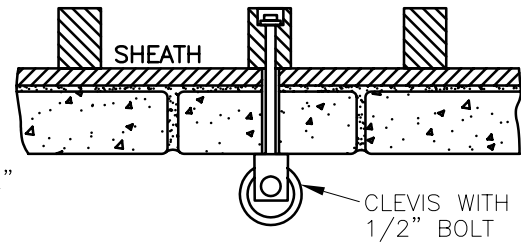
TO BE INSTALLED IN THE BRICK OR POURED CEMENT ONLY. NOT IN THE BRICK MORTAR.



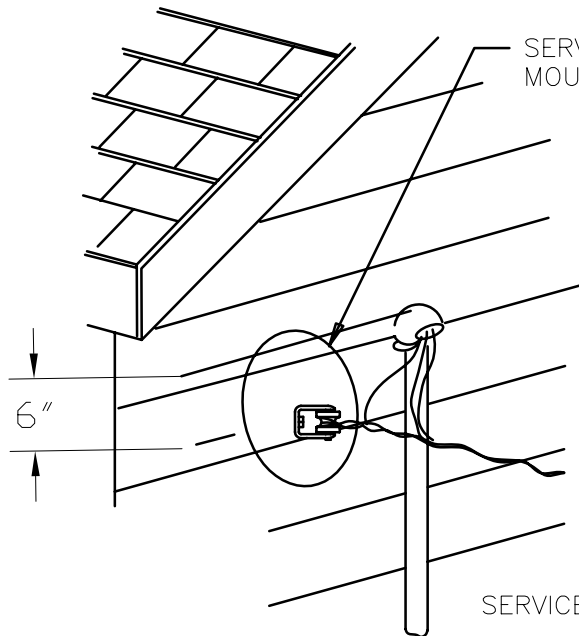
SOLID BRICK OR CONCRETE MASONRY

DRILL 9/16" HOLE IN STUD AND COUNTERSINK BOLT HEAD

BOLT TO BE INSTALLED BEFORE BRICKWORK IS STARTED.



BRICK VENEER



SERVICE ATTACHMENT MOUNTING DETAILS

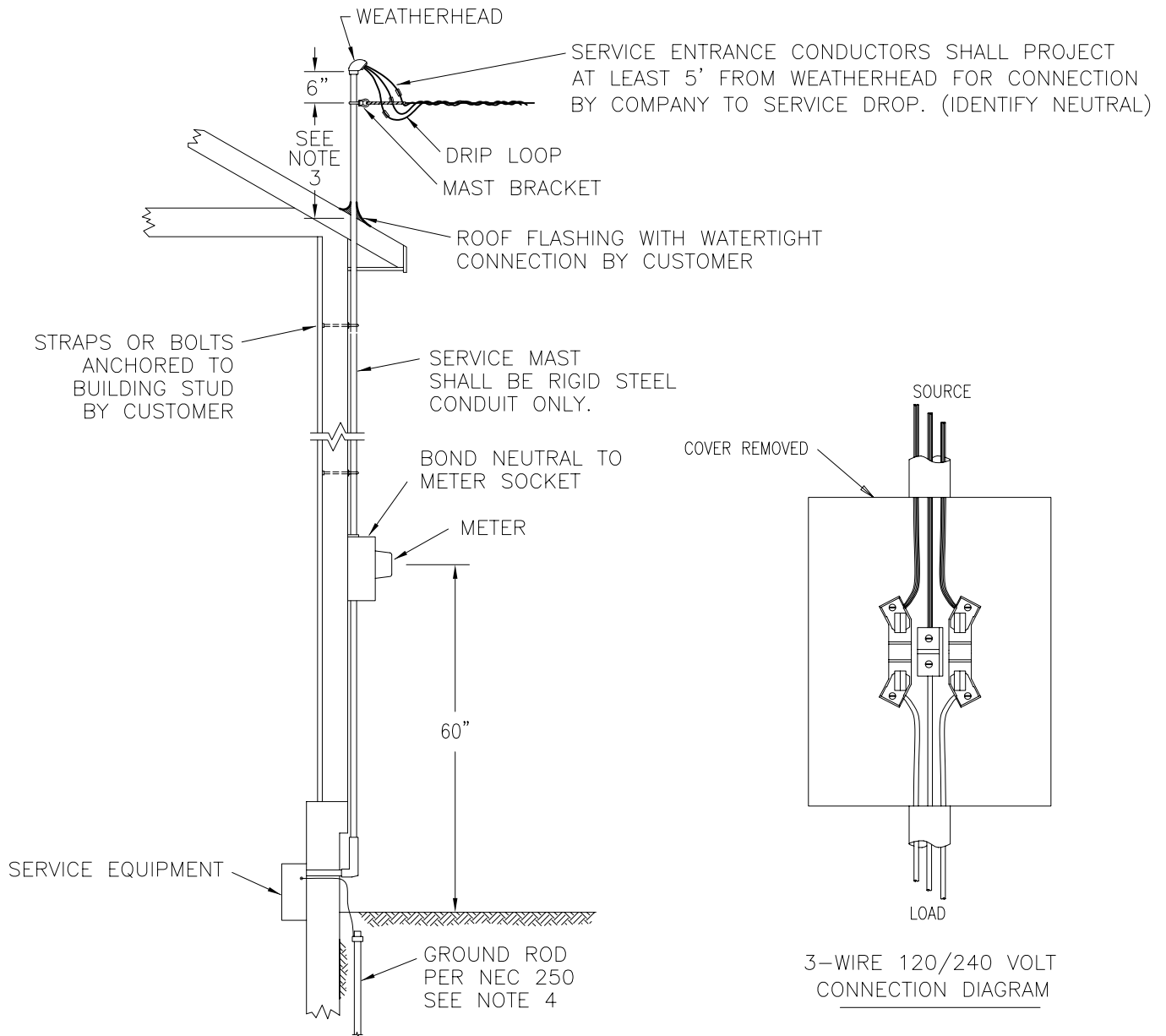
NOTE:

1. SERVICE DROP CLEARANCES ABOVE GRADE, ALLEYS, DRIVEWAYS AND AREAS SUBJECT TO TRUCK USE, TO BE IN ACCORDANCE WITH NESC. MINIMUM GROUND CLEARANCE OF 10 FEET TO THE BOTTOM OF THE DRIP LOOP IS REQUIRED PER NEC.
2. CUSTOMER MUST PROVIDE AND INSTALL SERVICE ATTACHMENT AT LOCATION APPROVED BY THE COMPANY. ◀
3. SECONDARY INSULATORS WITH CLEVIS AND 5/8" BOLT. SCREW-IN INSULATORS ARE NOT ACCEPTABLE.

OVERHEAD SERVICE SERVICE DROP ATTACHMENT

FirstEnergy.

Service Guide	REV.
EXHIBIT 3A	5
	DATE
	8/06



NOTES:

1. SERVICE DROP CLEARANCES ABOVE GRADE, ALLEYS, DRIVEWAYS, AND AREAS SUBJECT TO TRUCK USE, TO BE IN ACCORDANCE WITH NESC. MINIMUM GROUND CLEARANCE OF 10' TO THE BOTTOM OF THE DRIP LOOP IS REQUIRED PER NEC.
2. TWO BOLTED CONDUIT "U" CLAMPS MUST BE INSTALLED TO BUILDING STUD BY CUSTOMER.
3. IF 30" OR LESS USE MINIMUM OF 2" STEEL CONDUIT, FOR OVER 30" USE MINIMUM 3" STEEL CONDUIT. IF OVER 36" IS REQUIRED FOR GRADE CLEARANCE, GUYING MAY BE REQUIRED BY CUSTOMER PER COMPANY. NO COUPLINGS PERMITTED ABOVE ROOF LINE.
4. METER SOCKET(S) MAY BE CONNECTED TO AN EXTERNAL GROUND ROD, IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
5. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

**OVERHEAD SERVICE
RESIDENTIAL MAST INSTALLATION**

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Service Guide

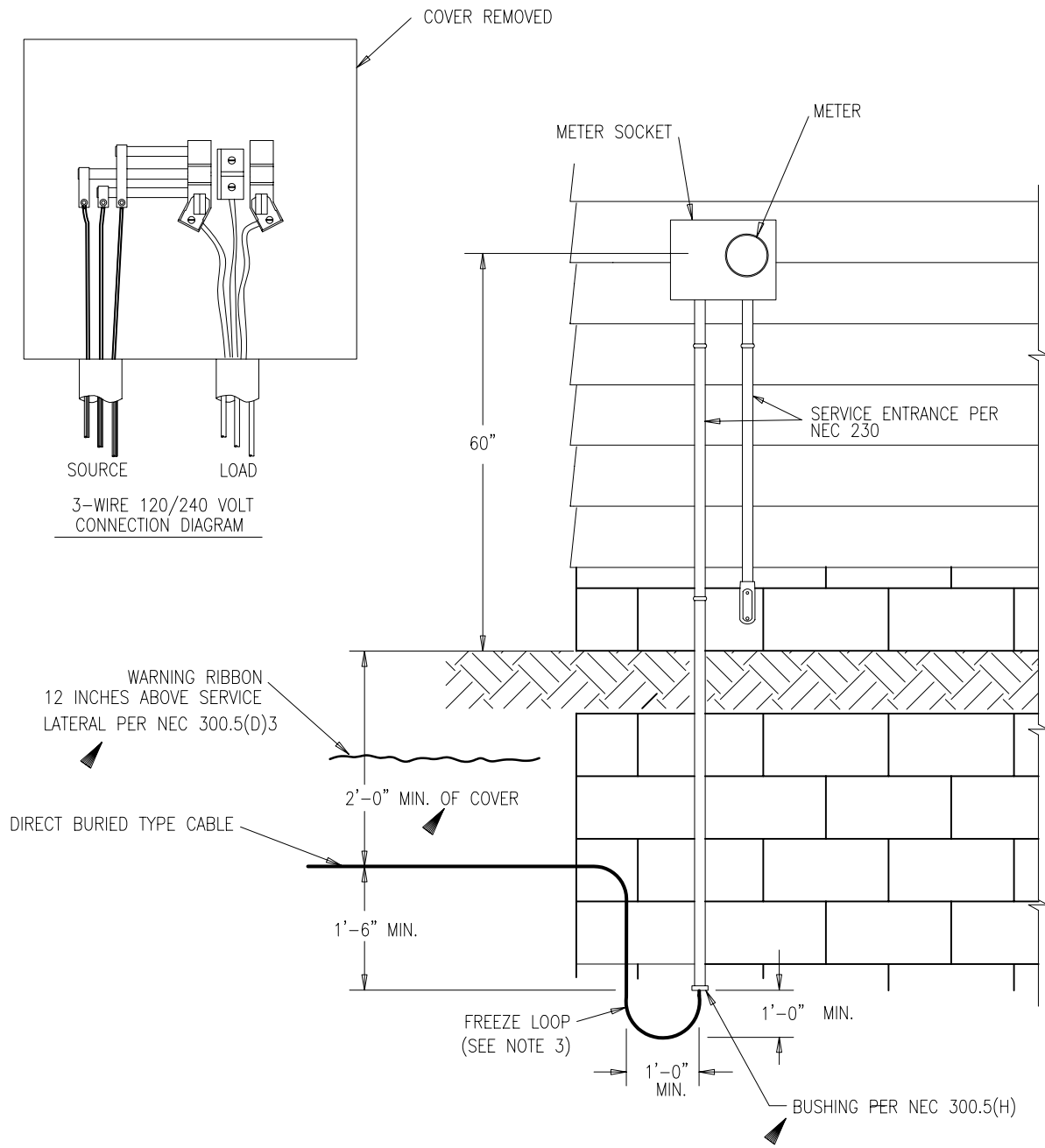
REV.

5

EXHIBIT 4

DATE

7/06



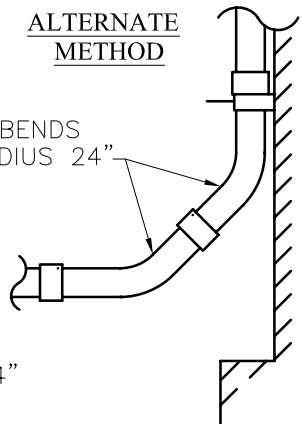
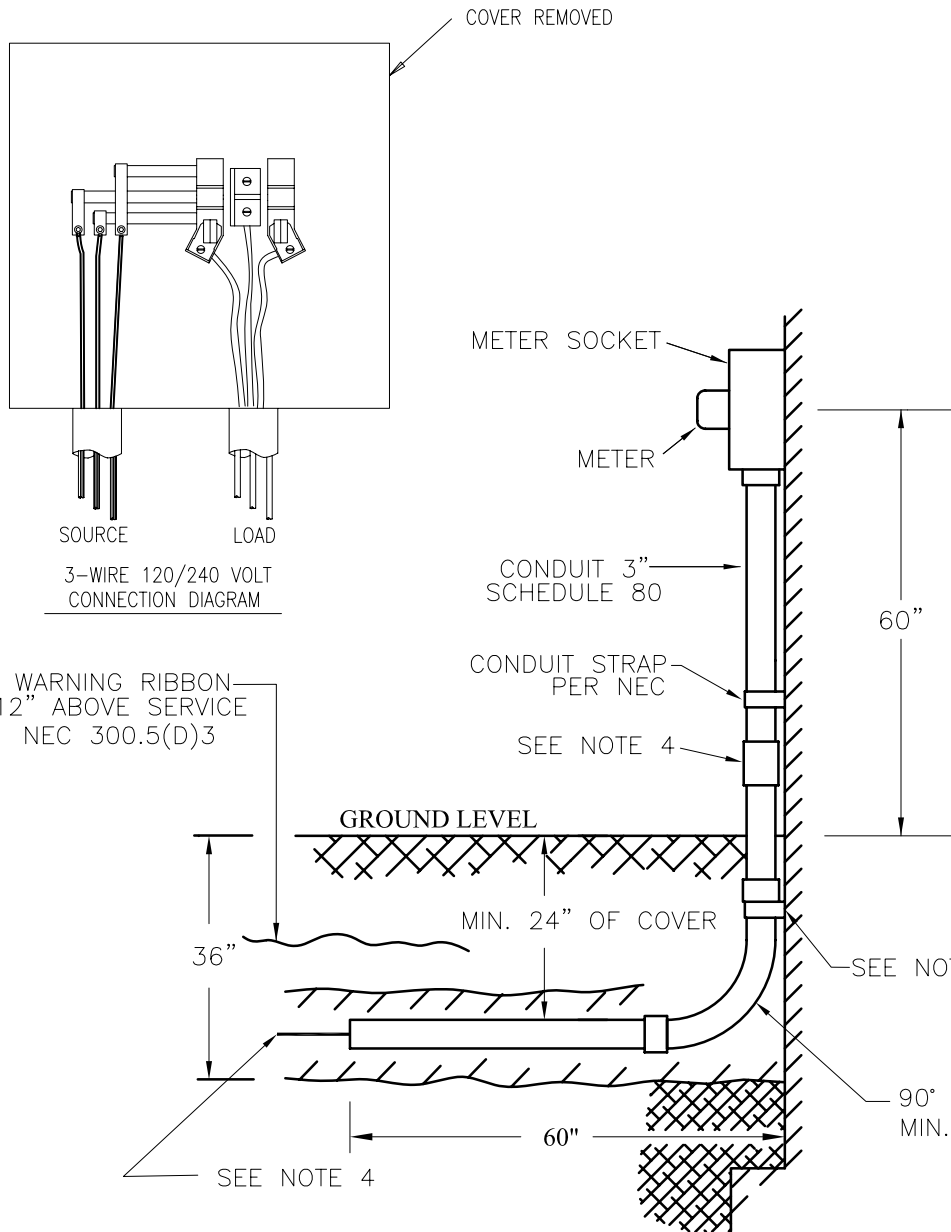
NOTES:

1. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD, IF REQUIRED BY LOCAL INSPECTION AUTHORITY.
2. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.
3. CUSTOMER SHALL PROVIDE GROUND MOVEMENT PROTECTION PER NEC 300.5(J) TO PREVENT DAMAGE DUE TO SETTLEMENT OR FROST HEAVES. THE COMPANY RECOMMENDS THE USE OF A SLIP JOINT CONDUIT PRODUCT SUCH AS RIZZCON SAFETY SLIP.

THIS EXHIBIT APPLICABLE FOR:
OHIO EDISON
ILLUMINATING COMPANY
PENN POWER
TOLEDO EDISON

**SINGLE-PHASE UNDERGROUND SERVICE
LATERAL INSTALLATION
(LESS THAN 400 AMP)**

FirstEnergy.	
Service Guide	REV. 2
EXHIBIT 5A	DATE 8/06



WARNING RIBBON
12" ABOVE SERVICE
NEC 300.5(D)3

3-WIRE 120/240 VOLT
CONNECTION DIAGRAM

SOURCE

LOAD

METER SOCKET

METER

CONDUIT 3"
SCHEDULE 80

CONDUIT STRAP
PER NEC

SEE NOTE 4

GROUND LEVEL

MIN. 24" OF COVER

36"

60"

ALTERNATE
METHOD

2-45° BENDS
MIN RADIUS 24"

SEE NOTE 3

90° BEND
MIN. RADIUS 24"

SEE NOTE 4

60"

NOTES:

1. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITY.
2. CUSTOMER TO SUPPLY AND INSTALL SERVICE LATERAL METER RISER CONDUIT AS SHOWN ABOVE. (BOND ALL JOINTS)
3. CONDUIT STRAP—LOCATE HEAVY GAUGE 2 HOLE GALVANIZED STRAP JUST BELOW BEND COUPLING. ANCHOR SECURELY INTO MASONRY USING 3/8" MIN. DIAMETER FASTENERS.
4. CUSTOMER SHALL PROVIDE GROUND MOVEMENT PROTECTION PER NEC 300.5(J) TO PREVENT DAMAGE DUE TO SETTLEMENT OR FROST HEAVES. THE COMPANY RECOMMENDS THE USE OF A SLIP JOINT CONDUIT PRODUCT SUCH AS RIZZCON SAFETY SLIP. SUFFICIENT CABLE SLACK OR A SLACK BOX SHALL BE PROVIDED TO ALLOW FOR CABLE MOVEMENT.

THIS EXHIBIT APPLICABLE FOR:
JERSEY CENTRAL POWER & LIGHT
MET-ED
PENELEC

**SINGLE-PHASE UNDERGROUND SERVICE
LATERAL INSTALLATION
(LESS THAN 400 AMP)**

FirstEnergy.

Service Guide

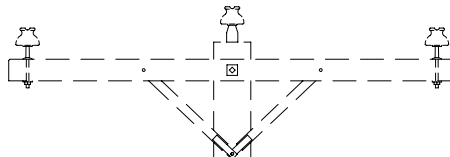
REV.

4

EXHIBIT 5B

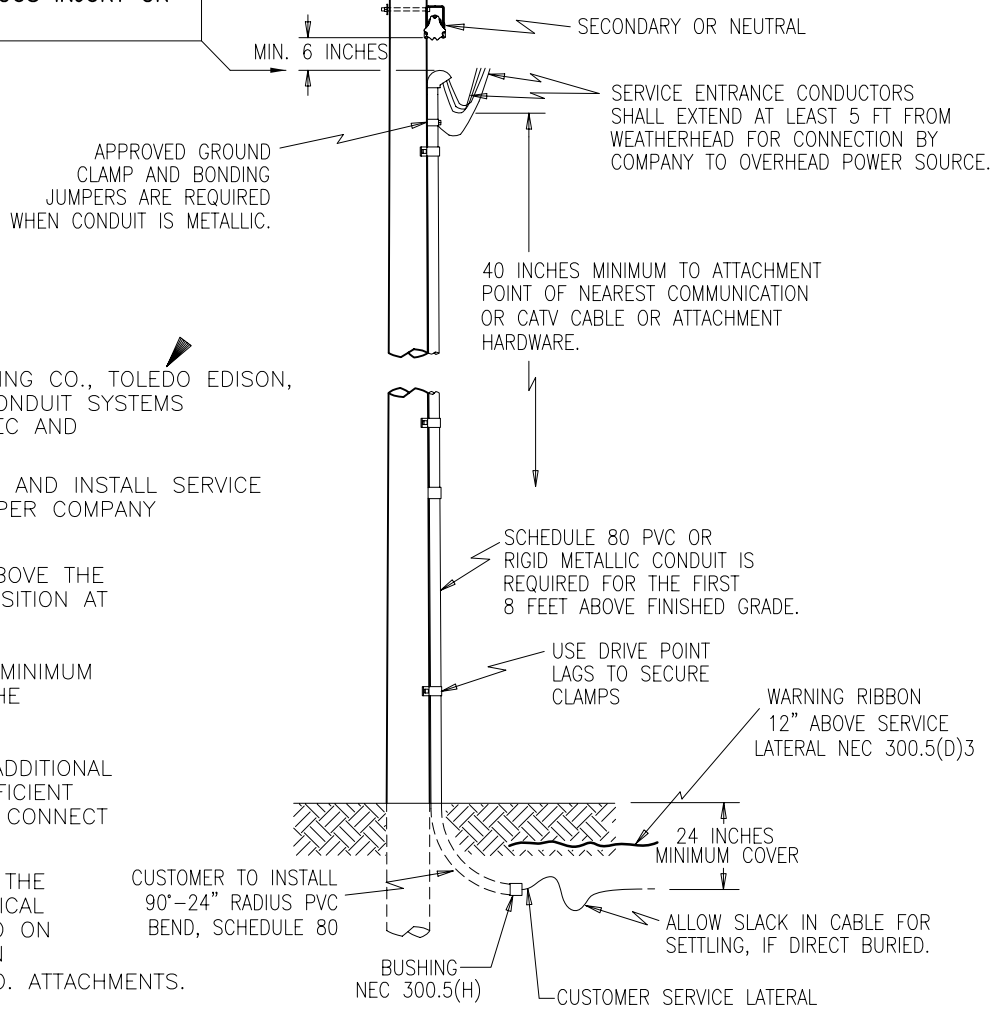
DATE

1/08



DANGER
 HIGH VOLTAGE ABOVE
 DO NOT CLIMB OR
 EXTEND CONDUIT ABOVE
 SECONDARY OR NEUTRAL

CAUTION: UNQUALIFIED PERSONNEL MUST REMAIN 10 FEET BELOW THIS ELEVATION WITH MATERIAL, EQUIPMENT, OR ANY PART OF THEIR BODY WHEN PERFORMING WORK RELATED ACTIVITIES. SERIOUS INJURY OR DEATH MAY RESULT.



NOTES:

1. OHIO EDISON, THE ILLUMINATING CO., TOLEDO EDISON, AND PENN POWER (COM), CONDUIT SYSTEMS SHALL BE INSTALLED PER NEC AND LOCAL REQUIREMENTS.
2. PENN POWER (RES) PROVIDE AND INSTALL SERVICE LATERAL AND RISER GUARD PER COMPANY CONSTRUCTION STANDARDS.
3. DO NOT EXTEND CONDUIT ABOVE THE SECONDARY OR NEUTRAL POSITION AT ANY TIME.
4. CONDUIT SHALL MAINTAIN A MINIMUM CLEARANCE OF 6" BELOW THE SECONDARY OR NEUTRAL.
5. CUSTOMER SHALL PROVIDE ADDITIONAL CONTINUOUS CABLE OF SUFFICIENT LENGTH (5 FT MINIMUM) TO CONNECT WITH OVERHEAD SOURCE.
6. COMPANY SHALL DETERMINE THE LOCATION/POSITION OF VERTICAL RISERS ON THE POLE BASED ON TRAFFIC FLOW AND LOCATION OF CATV, OR TELEPHONE CO. ATTACHMENTS.

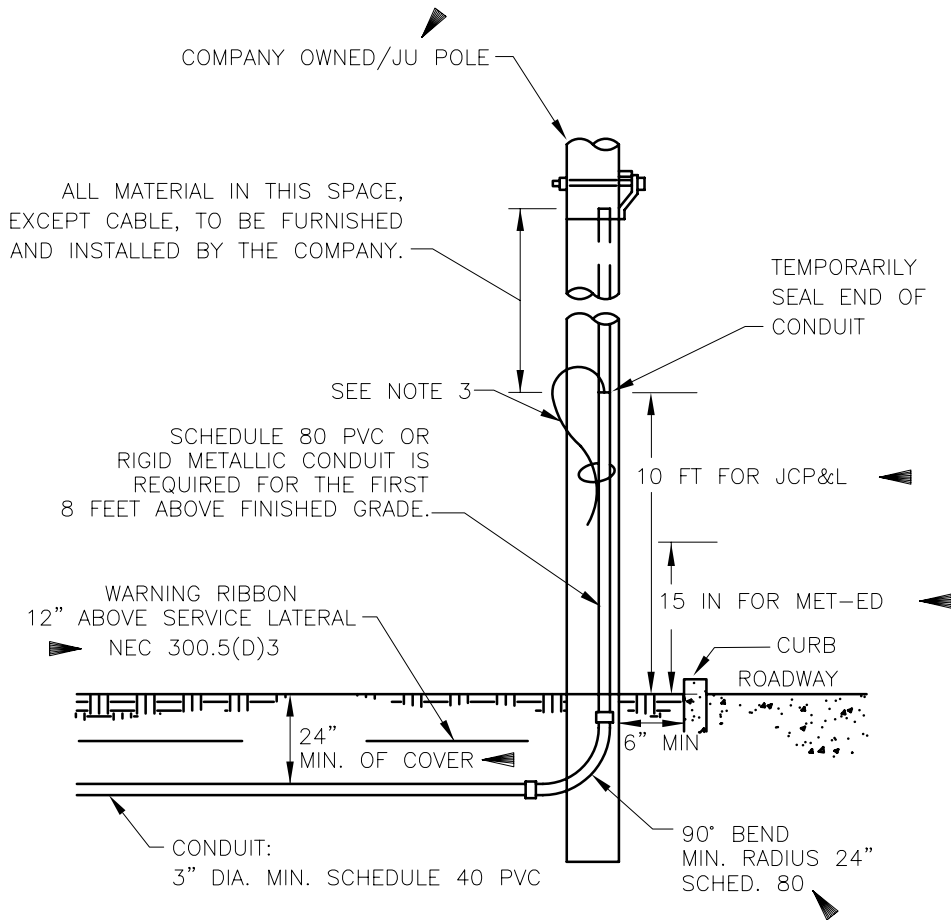
MATERIAL	SUPPLIED BY	INSTALLED BY
POLE	COMPANY	COMPANY
TRENCHING	CUSTOMER	CUSTOMER
CONDUIT & HARDWARE	CUSTOMER	CUSTOMER
SERVICE LATERAL	CUSTOMER	CUSTOMER
CONDUCTOR (NOTE 5)		

IT IS THE RESPONSIBILITY OF THE INSTALLER TO BE "QUALIFIED" TO INSTALL ELECTRICAL EQUIPMENT IN THE VICINITY OF OVERHEAD DISTRIBUTION LINES AS DESCRIBED IN OSHA 1910 SUBPARTS R. & S. ALL SERVICE INSTALLATIONS SHALL MEET ALL FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS.

DIRECT ATTACHMENT OF CUSTOMER UNDERGROUND SECONDARY SERVICE LATERAL(S) ON OHIO EDISON, PENN POWER, TOLEDO EDISON, OR ILLUMINATING CO. POLES

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Service Guide	REV.
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EXHIBIT 6A	DATE
	11/09



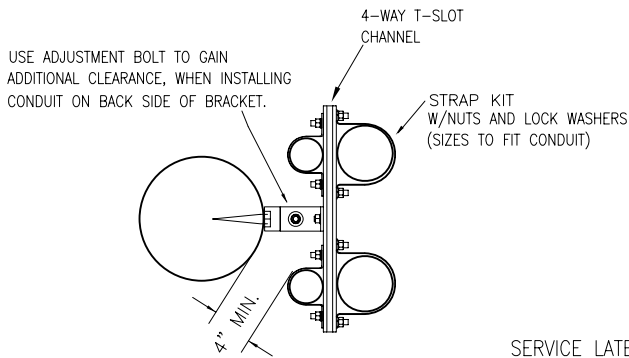
NOTES:

1. THE COMPANY WILL DESIGNATE THE QUARTER OF THE POLE FOR INSTALLATION OF THE SERVICE RISER, BASED UPON TRAFFIC FLOW AND LOCATION OF TELEPHONE OR CABLE COMPANY ATTACHMENTS.
2. WHEN THE CONDUIT RISER IS 3" IN DIAMETER, IT SHALL BE STRAPPED DIRECTLY TO THE POLE; RISER CONDUITS GREATER THAN 3" IN DIAMETER SHALL BE SET-OFF 5-1/2" FROM POLE ON COMPANY SUPPLIED STANDOFF BRACKETS. (SEE EXHIBIT 7B)
3. CUSTOMER TO INSTALL NEC APPROVED RISER CONDUIT 10 FEET FOR JCP&L OR 15 INCHES FOR MET-ED, AND IF CUSTOMER IS TO INSTALL CABLE, FURNISH ENOUGH CABLE AT THE TOP TO REACH THE COMPANY'S SECONDARY MAIN OR TRANSFORMER. IF THE CUSTOMER IS TO INSTALL CABLE, CUSTOMER SHALL PROVIDE PULL ROPE.
4. IF METALLIC CONDUIT IS USED FOR THE SERVICE RISER, IT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS.
5. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

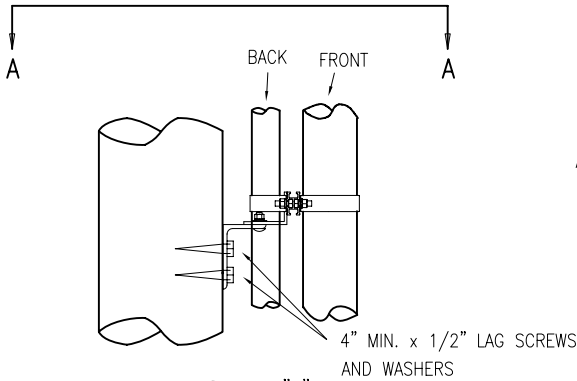
THIS EXHIBIT APPLICABLE FOR:
 JERSEY CENTRAL POWER & LIGHT
 MET-ED
 PENELEC

DIRECT ATTACHMENT OF CUSTOMER UNDERGROUND SECONDARY SERVICE LATERAL(S) ON JCP&L, MET-ED, OR PENELEC POLES

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Service Guide	REV.
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EXHIBIT 6B	DATE
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SECTION "A-A"
N.T.S.

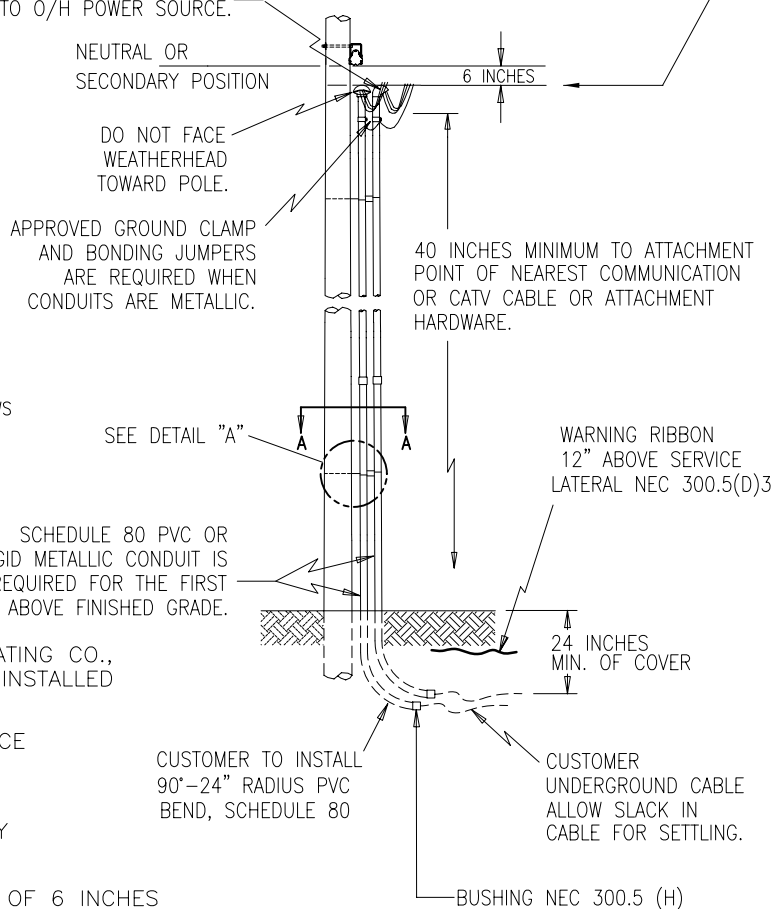


DETAIL "A"
N.T.S.

MANUFACTURED ASSEMBLY

CAUTION: UNQUALIFIED PERSONNEL MUST REMAIN 10 FEET BELOW THIS ELEVATION WITH MATERIAL, EQUIPMENT OR ANY PART OF THEIR BODY WHEN PERFORMING WORK RELATED ACTIVITIES. SERIOUS INJURY OR DEATH MAY RESULT.

SERVICE LATERAL CONDUCTORS SHALL EXTEND AT LEAST 5 FEET FROM WEATHERHEAD FOR CONNECTION BY COMPANY TO O/H POWER SOURCE.



NOTES:

- OHIO EDISON, PENN POWER (COM), THE ILLUMINATING CO., & TOLEDO EDISON CONDUIT SYSTEMS SHALL BE INSTALLED PER NEC AND LOCAL REQUIREMENTS.
- PENN POWER (RES) PROVIDE AND INSTALL SERVICE LATERAL AND RISER GUARD PER COMPANY CONSTRUCTION STANDARDS.
- DO NOT EXTEND CONDUIT ABOVE THE SECONDARY OR NEUTRAL POSITION AT ANY TIME.
- CONDUIT SHALL MAINTAIN A MINIMUM CLEARANCE OF 6 INCHES BELOW THE SECONDARY OR NEUTRAL.
- CUSTOMER SHALL PROVIDE ADDITIONAL CONTINUOUS CABLE OF SUFFICIENT LENGTH (MIN. 5 FEET) TO CONNECT WITH OVERHEAD SOURCE.
- THE COMPANY SHALL DETERMINE THE LOCATION/POSITION OF VERTICAL RISERS ON THE POLE.

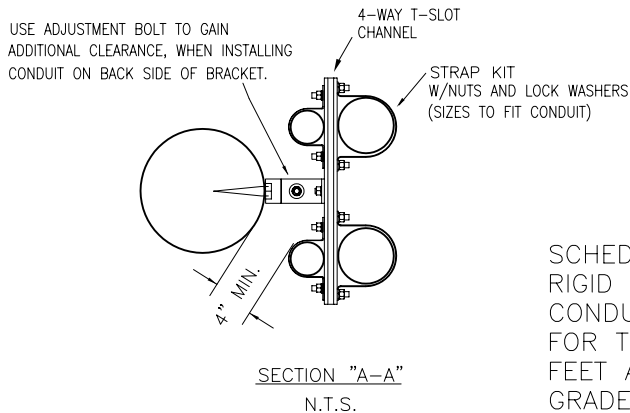
MATERIAL	SUPPLIED BY	INSTALLED BY
POLE	COMPANY	COMPANY
TRENCHING	CUSTOMER	CUSTOMER
CONDUIT	CUSTOMER	CUSTOMER
SERVICE LATERAL CONDUCTOR (NOTE 5)	CUSTOMER	CUSTOMER

IT IS THE RESPONSIBILITY OF THE INSTALLER TO BE "QUALIFIED" TO INSTALL ELECTRICAL EQUIPMENT IN THE VICINITY OF OVERHEAD DISTRIBUTION LINES AS DESCRIBED IN OSHA 1910 SUBPARTS R & S. ALL SERVICE INSTALLATIONS SHALL MEET ALL FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS.

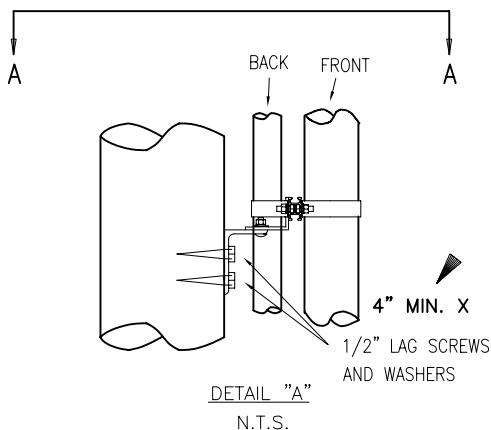
STANDOFF ATTACHMENT OF CUSTOMER UNDERGROUND SECONDARY SERVICE LATERAL(S) ON OHIO EDISON, PENN POWER, TOLEDO EDISON, OR ILLUMINATING CO. POLES

FirstEnergy

Service Guide	REV.
EXHIBIT 7A	5
	DATE
	11/09



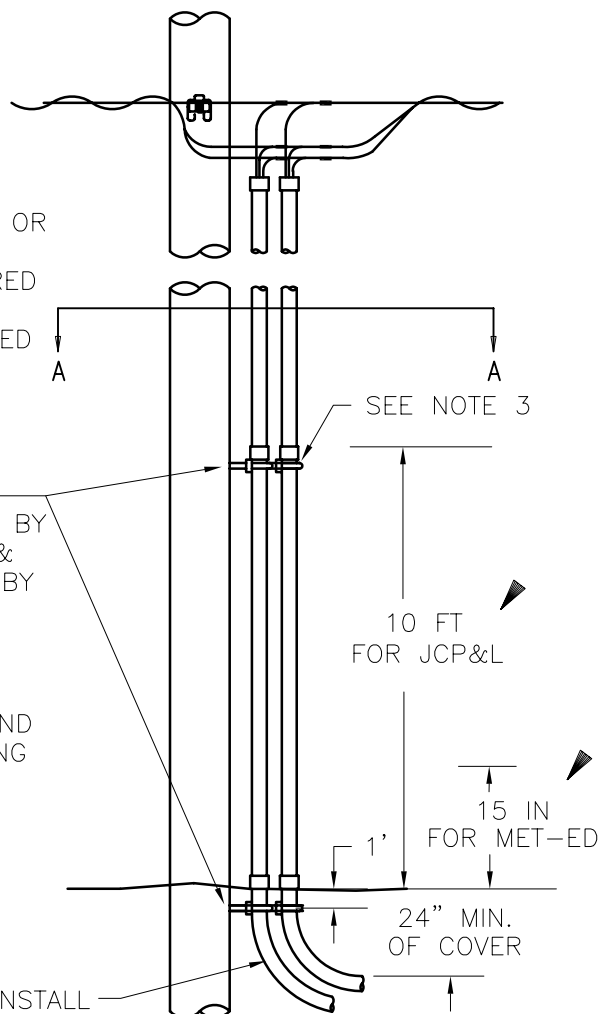
SCHEDULE 80 PVC OR RIGID METALLIC CONDUIT IS REQUIRED FOR THE FIRST 8 FEET ABOVE FINISHED GRADE.



BRACKETS FURNISHED BY COMPANY & INSTALLED BY CUSTOMER.

APPROVED GROUND CLAMP & BONDING JUMPERS ARE REQUIRED WHEN CONDUITS ARE METALLIC.

CUSTOMER TO INSTALL 90°-24" MIN. RADIUS PVC BEND, SCHEDULE 80



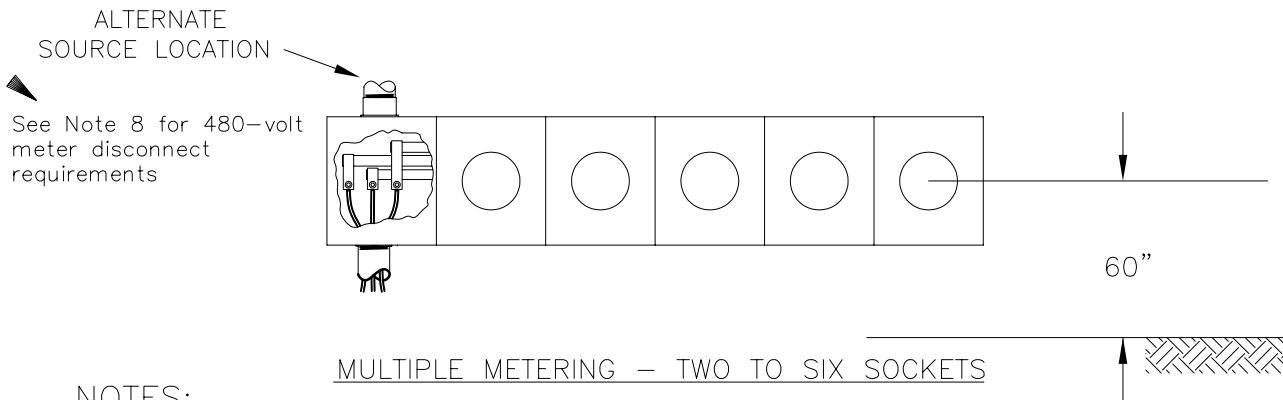
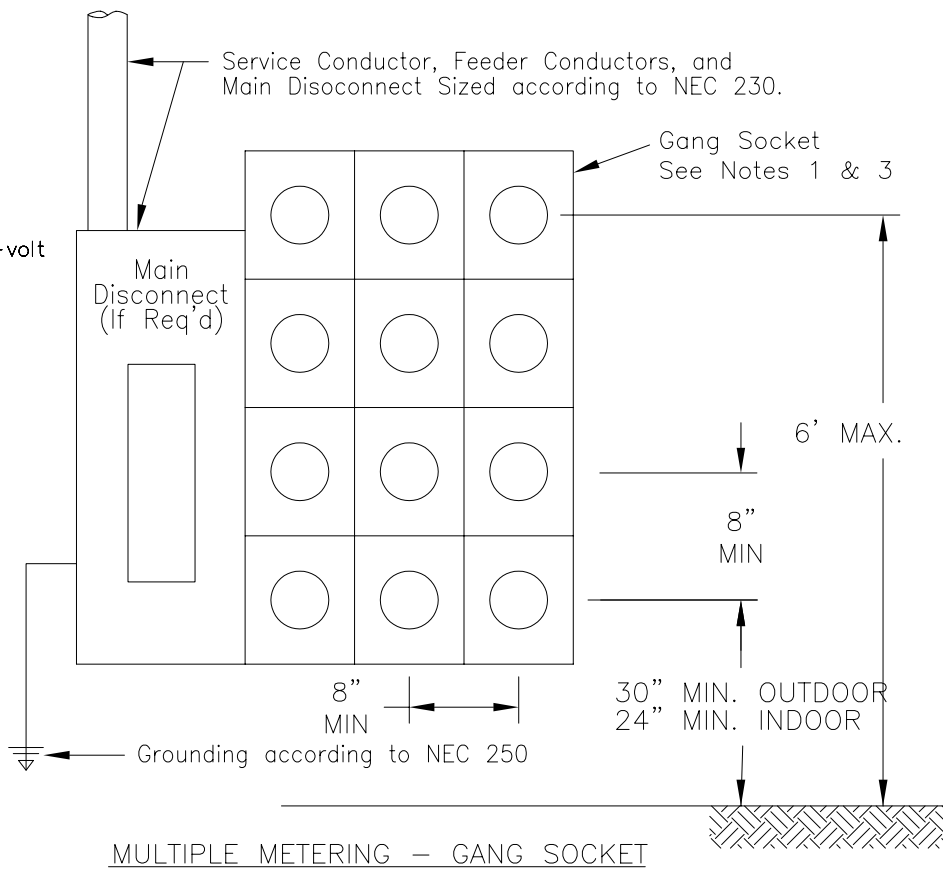
NOTES:

1. THE COMPANY WILL DESIGNATE THE QUARTER OF THE POLE FOR INSTALLATION OF THE SERVICE RISER, BASED UPON TRAFFIC FLOW AND LOCATION OF TELEPHONE COMPANY ATTACHMENTS.
2. WHEN THE CONDUIT RISER IS 3" IN DIAMETER, IT SHALL BE STRAPPED DIRECTLY TO THE POLE (SEE EXHIBIT 6B); RISER CONDUITS GREATER THAN 3" IN DIAMETER SHALL BE SET-OFF 5 1/2" FROM POLE ON COMPANY SUPPLIED STANDOFF BRACKETS.
- ▶ 3. CUSTOMER TO INSTALL NEC APPROVED RISER CONDUIT 10 FEET FOR JCP&L OR 15 INCHES FOR MET-ED, AND IF CUSTOMER IS TO INSTALL CABLE, FURNISH ENOUGH CABLE AT THE TOP TO REACH THE COMPANY'S SECONDARY MAIN OR TRANSFORMER. IF THE CUSTOMER IS TO INSTALL CABLE, CUSTOMER SHALL PROVIDE PULL ROPE.
4. IF METALLIC CONDUIT IS USED FOR THE SERVICE RISER, IT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS.
5. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

THIS EXHIBIT APPLICABLE FOR:
MET-ED, PENELEC, AND
▶ JERSEY CENTRAL POWER & LIGHT

STANDOFF ATTACHMENT OF CUSTOMER UNDERGROUND SECONDARY SERVICE LATERAL(S) ON MET-ED, PENELEC, OR JERSEY CENTRAL POWER & LIGHT POLES

FirstEnergy.	
Service Guide	REV. 3
EXHIBIT 7B	DATE 8/06



NOTES:

1. Contact the Regional Meter Services Department before installation of ganged sockets.
2. Main Disconnecting means not required with six meters or less.
3. Height not to exceed 4 meter positions.
4. All sockets (Inside and Out) and Breakers must be permanently and plainly marked to designate the specific unit served.
- ▶ 5. If installation contains poly-phase or 480-volt meter sockets, these must be plainly marked.
6. Meter socket(s) may be connected to an external ground rod if required by local Inspection Authorities.
7. For customer/Company responsibilities see Company specific Service Guide Exhibit 19.
- ▶ 8. For 480-Volt services, a disconnecting means is required on the source side of each meter socket. This requirement also applies to 480-Volt multiple metering units with a main disconnect. See Exhibit 22 for details.

**MULTIPLE METERING
INSTALLATION
400 AMP MAX**

FirstEnergy.

Service Guide

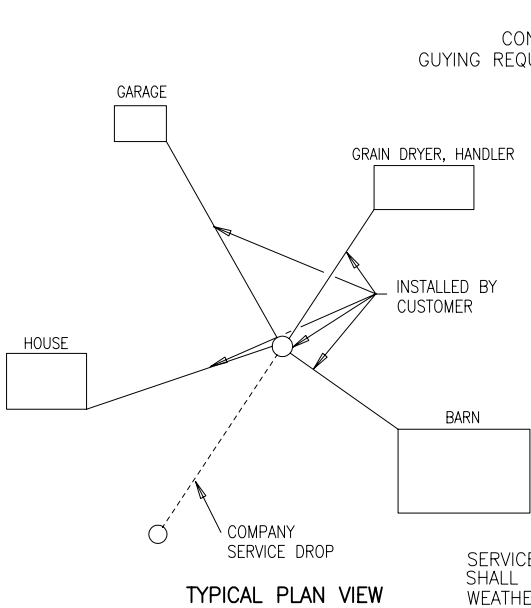
REV.

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EXHIBIT 8

DATE

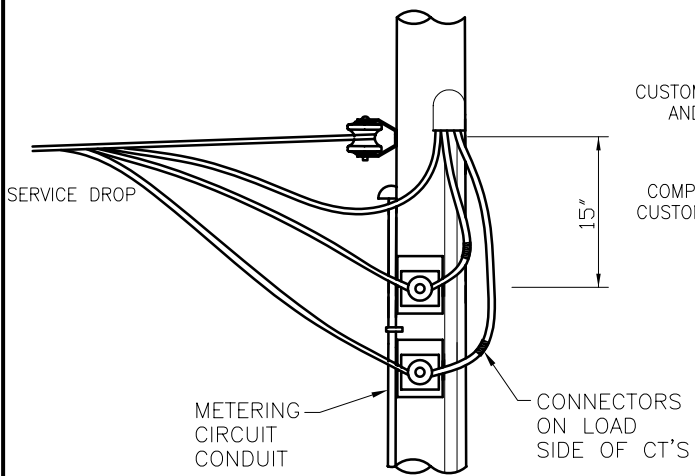
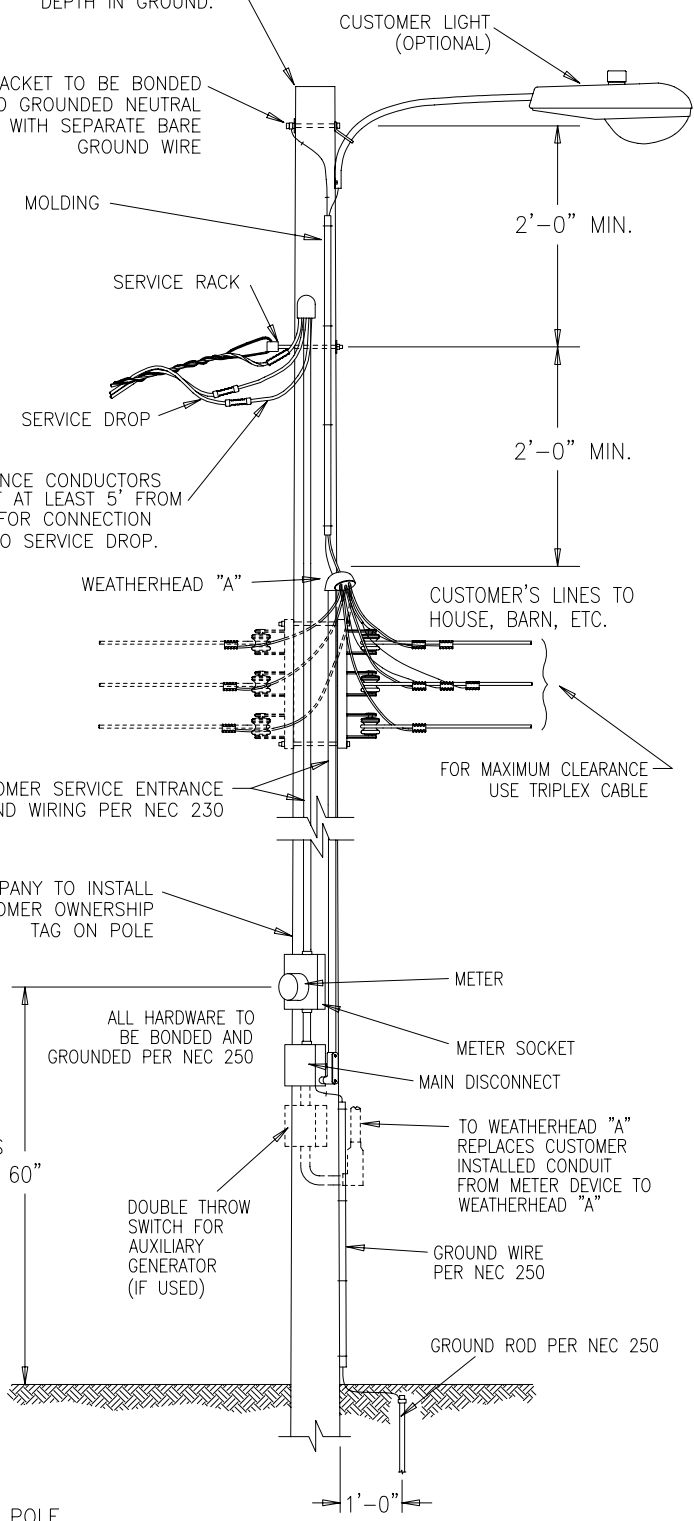
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CUSTOMER OWNED POLE
CONSULT COMPANY FOR LOCATION,
GUYING REQUIREMENTS, HEIGHT, CLASS AND
DEPTH IN GROUND.

BRACKET TO BE BONDED
TO GROUNDED NEUTRAL
WITH SEPARATE BARE
GROUND WIRE

SERVICE ENTRANCE CONDUCTORS
SHALL PROJECT AT LEAST 5' FROM
WEATHERHEAD FOR CONNECTION
BY COMPANY TO SERVICE DROP.



**CURRENT TRANSFORMER LOCATION
SEE NOTES 4 & 5**

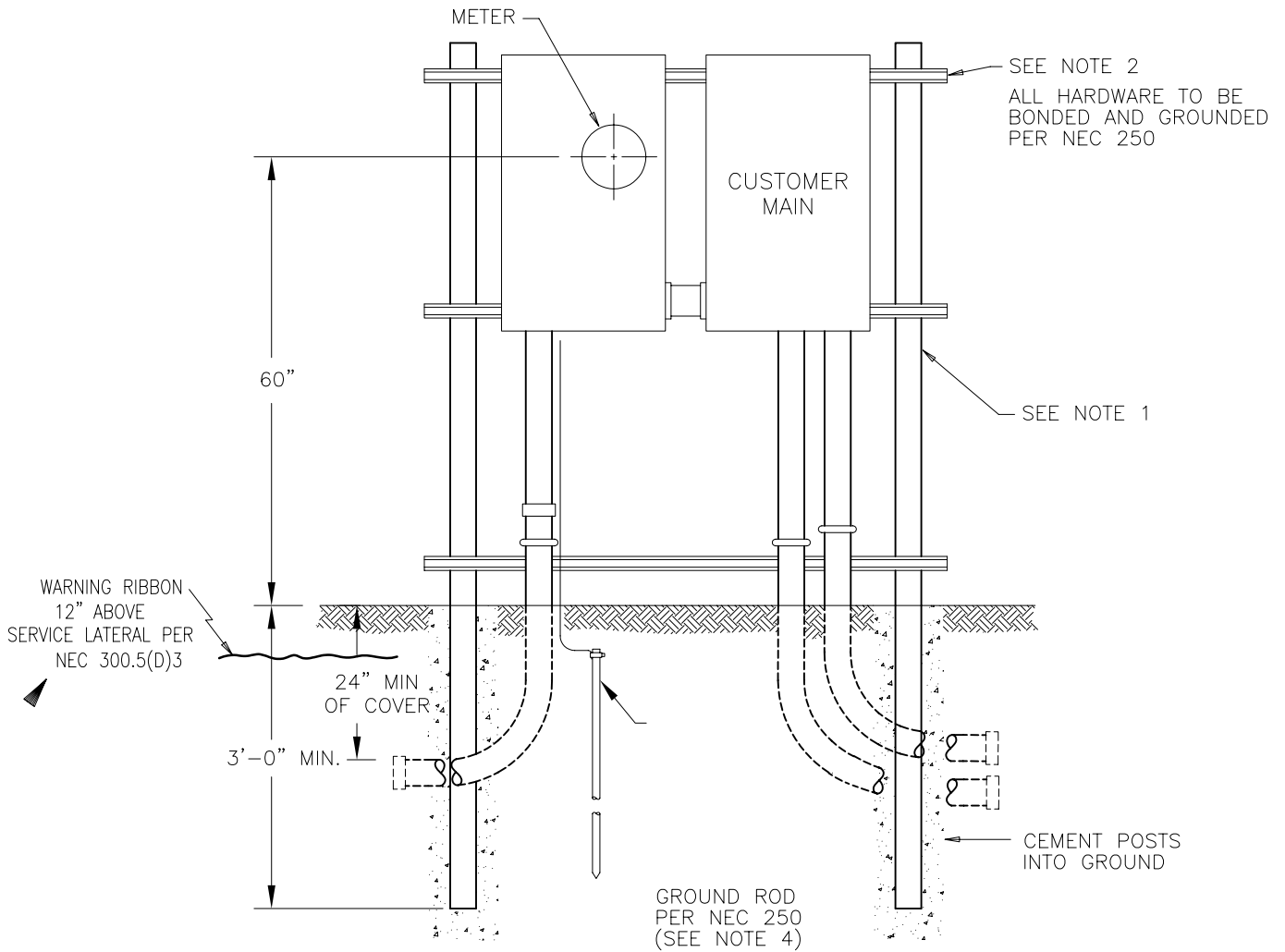
NOTES:

1. SERVICE DROP CLEARANCES ABOVE GRADE, ALLEYS, DRIVEWAYS, AND AREAS SUBJECT TO TRUCK USE, TO BE IN ACCORDANCE WITH NESC. MINIMUM GROUND CLEARANCE OF 10 FT TO THE BOTTOM OF THE DRIP LOOP IS REQUIRED PER NEC.
2. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.
3. SERVICE ATTACHMENT SHALL BE A SECONDARY INSULATOR WITH CLEVIS AND 5/8" DIA. BOLT FASTENED THROUGH THE POLE.
4. FOR SERVICE 400 AMPS & LARGER, CURRENT TRANSFORMER IS REQUIRED. CONTACT COMPANY.
5. NOT ALLOWED IN NEW JERSEY. CONTACT METER DEPARTMENT.

**OVERHEAD SERVICE
CENTRAL DISTRIBUTION INSTALLATION**



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EXHIBIT 9	5
	DATE
	8/06



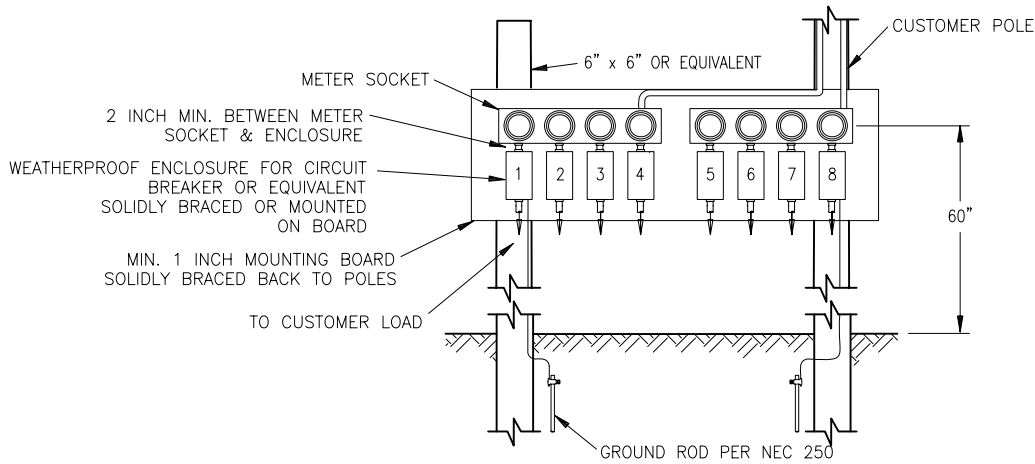
NOTES:

1. SUPPORT POST – USE ANY OF THE FOLLOWING:
 2–3” MIN. STEEL PIPE CAPPED AND CEMENTED IN GROUND
 2–3” MIN. GALV. STEEL I-BEAM (3/8”–1/2” THICK) CEMENTED IN GROUND
 2–3” MIN. CHANNEL IRON CEMENTED IN GROUND
2. MOUNTING HARDWARE – TWO 12 GAUGE 1–5/8” X 1–5/8” CONTINUOUS SLOT HOT DIPPED GALVANIZED CHANNEL (e.g., UNISTRUT) COMPLETE WITH 1–1/4” X 5/16” DIA. 13 THD. SPRING NUT (2 PER CHANNEL), 5/16” HEX NUT, AND LOCK WASHER SECURELY MOUNTED TO SUPPORT POSTS.
3. SUPPLY SIDE CONDUIT SHALL BE RIGID GALVANIZED OR IMC STEEL, OR SCHEDULE 80 PVC (ELECTRICAL GRADE).
4. METER SOCKET(S) MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
5. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

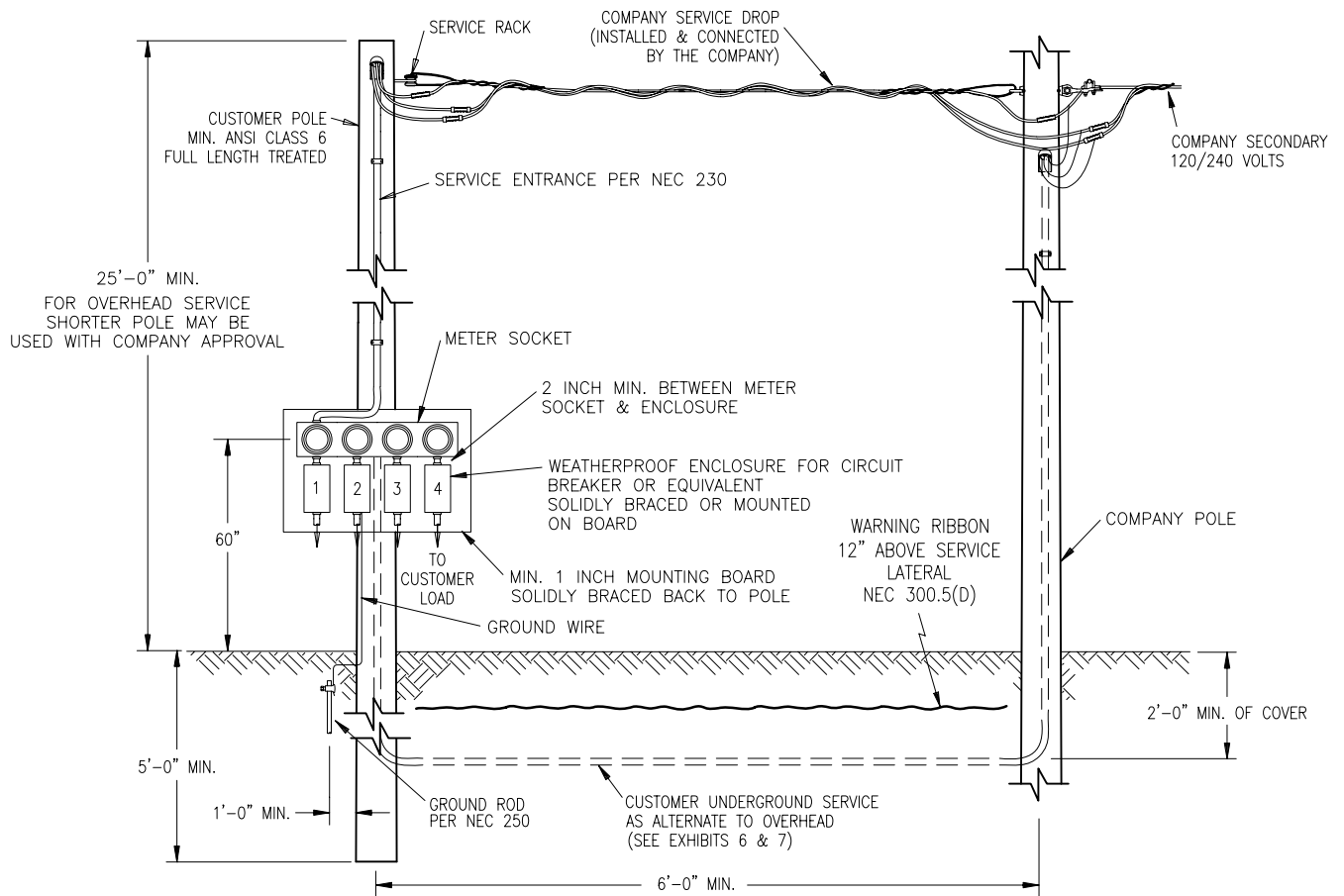
**UNDERGROUND SERVICE
CENTRAL DISTRIBUTION INSTALLATION**

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Service Guide	REV.
EXHIBIT 10	5
	DATE
	8/06



METER & CIRCUIT BREAKER ARRANGEMENT (5 OR MORE METERS)



NOTES:

1. ALL SOCKETS (INSIDE & OUT) AND BREAKERS MUST BE PERMANENTLY & PLAINLY MARKED TO DESIGNATE THE PARTICULAR UNIT SERVED.
2. A MAIN DISCONNECT MEANS MAY BE REQUIRED, PER NEC.
3. ALL WOODEN PRODUCTS TO BE PRESSURE TREATED. ◀
4. ALL HARDWARE TO BE BONDED AND GROUNDED PER NEC 250.
5. METER SOCKET(S) MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
6. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

**METERING & SERVICE FACILITIES
FOR MOBILE HOME PARKS
& TRAVEL TRAILER PARKS**

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Service Guide

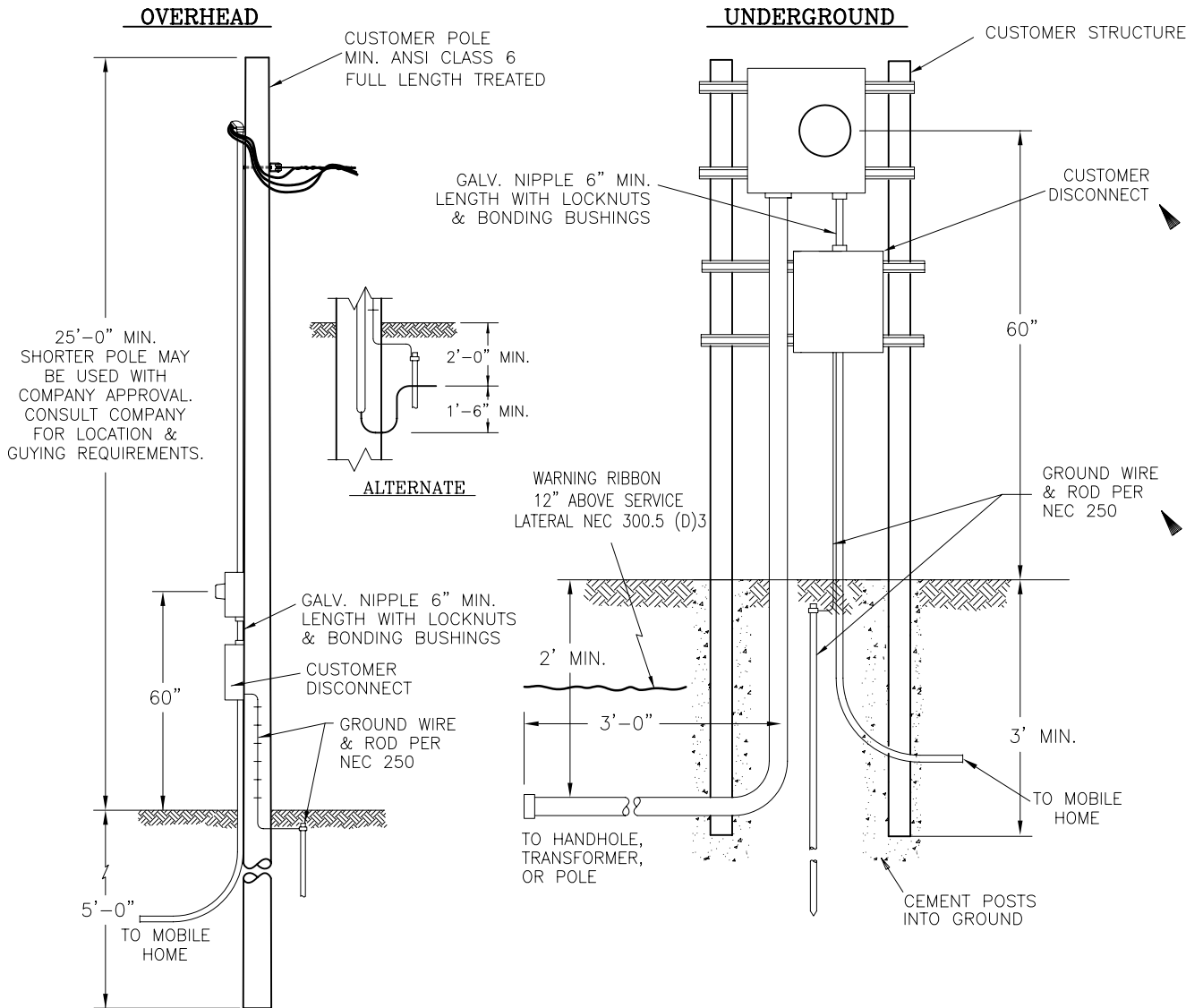
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EXHIBIT 11

DATE

1/08



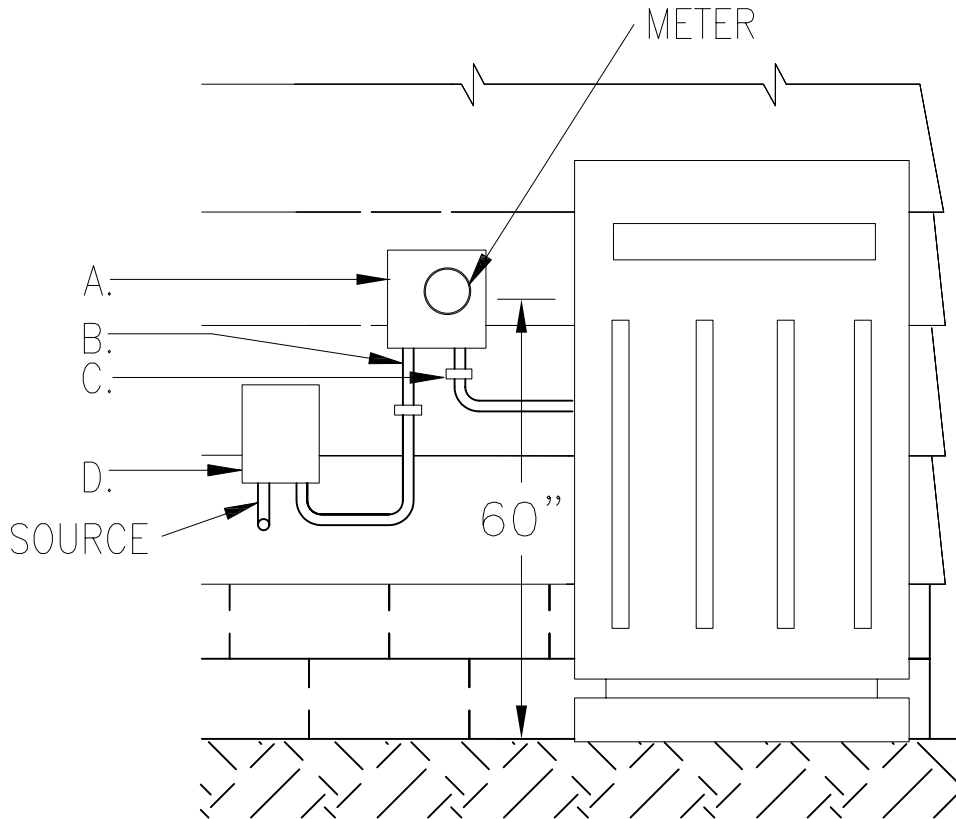
NOTES:

1. SUPPORT POST – USE ANY OF THE FOLLOWING :
 2-3" MIN. STEEL PIPE CAPPED AND CEMENTED IN GROUND
 2-3" MIN. GALV. STEEL I-BEAM (3/8"-1/2" THICK) CEMENTED IN GROUND
 2-3" MIN. CHANNEL IRON CEMENTED IN GROUND
2. MOUNTING HARDWARE – TWO 12 GAUGE 1-5/8" X 1-5/8" CONTINUOUS SLOT HOT DIPPED GALVANIZED CHANNEL (e.g., UNISTRUT) COMPLETE WITH 1-1/4" X 5/16" DIA. 13 THD SPRING NUT (2 PER CHANNEL), 5/16" HEX NUT, AND LOCK WASHER SECURELY MOUNTED TO SUPPORT POSTS.
3. PRE-FABRICATED METER PEDESTAL MAY BE SUBSTITUTED FOR 1 & 2 ABOVE. CONTACT REGION METER MANAGER.
4. WHEN USING DIRECT BURIAL CABLE, USE THE "ALTERNATE".
5. CUSTOMER DISCONNECT PER NEC.
6. CUSTOMER SECURITY LIGHT CAN BE INSTALLED ON THE POLE IF A CLEARANCE OF 2'-0" MIN. ABOVE OR BELOW WEATHERHEAD IS MAINTAINED AND COMPANY APPROVAL IS OBTAINED.
7. FOR IDENTIFICATION PURPOSES, THE SOCKET (INSIDE & OUT) AND BREAKER MUST BE PERMANENTLY AND PLAINLY MARKED TO DESIGNATE THE ADDRESS NUMBER BEING SERVED.
8. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD, IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
9. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

**SINGLE MOBILE HOME SERVICE
OVERHEAD & UNDERGROUND**

FirstEnergy

Service Guide	REV.
EXHIBIT 12	6
	DATE
	12/07



LEGEND

- A. HEAT PUMP METER SOCKET (TO BE WIRED AFTER DISCONNECT) INSTALLED PER NEC.
- B. CONDUIT
- C. CONDUIT STRAP(S) (PER NEC)
- D. DISCONNECT DEVICE

NOTES:

1. STENCIL "HEAT PUMP ONLY" ON METER SOCKET.
2. METER CANNOT BE MOUNTED BEHIND HEAT PUMP.
3. CUSTOMER RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL ITEMS EXCEPT THE METER.
4. NOT APPLICABLE IN JCP&L, MET-ED, OR PENELEC.

**ADD-ON HEAT PUMP METERING
(SEPARATELY METERED)**

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Service Guide

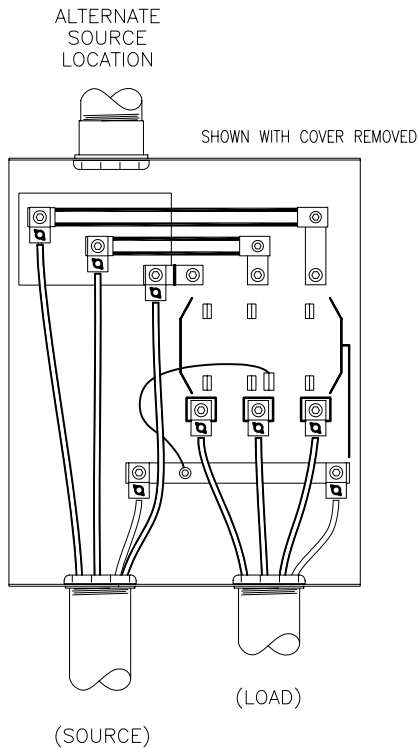
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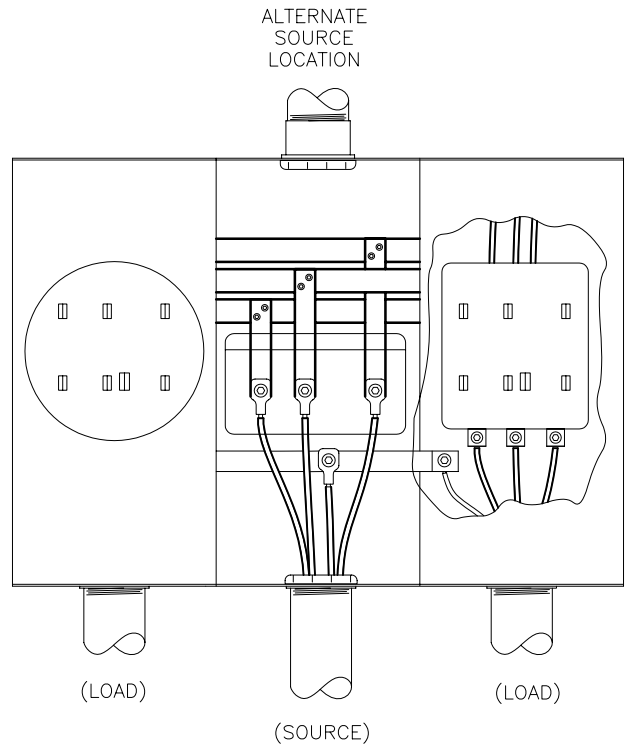
EXHIBIT 13

DATE

7/06



SINGLE SERVICE METERING



MULTI-SERVICE METERING

NOTES:

1. All meter locations shall be approved by the Company.
2. Customer service equipment shall be grounded per NEC 250.
3. Meter socket may be connected to an external ground rod if required by the local Inspection Authorities.
4. For customer/Company responsibilities, see Company specific Service Guide Exhibit 19.
- ▶ 5. For 480-Volt services, a disconnecting means is required on the source side of the meter socket. See Exhibit 22 for details.

**METERING INSTALLATION – INDOOR/OUTDOOR
SELF-CONTAINED METERS
THREE-PHASE LESS THAN 400 AMP**

FirstEnergy.

Service Guide

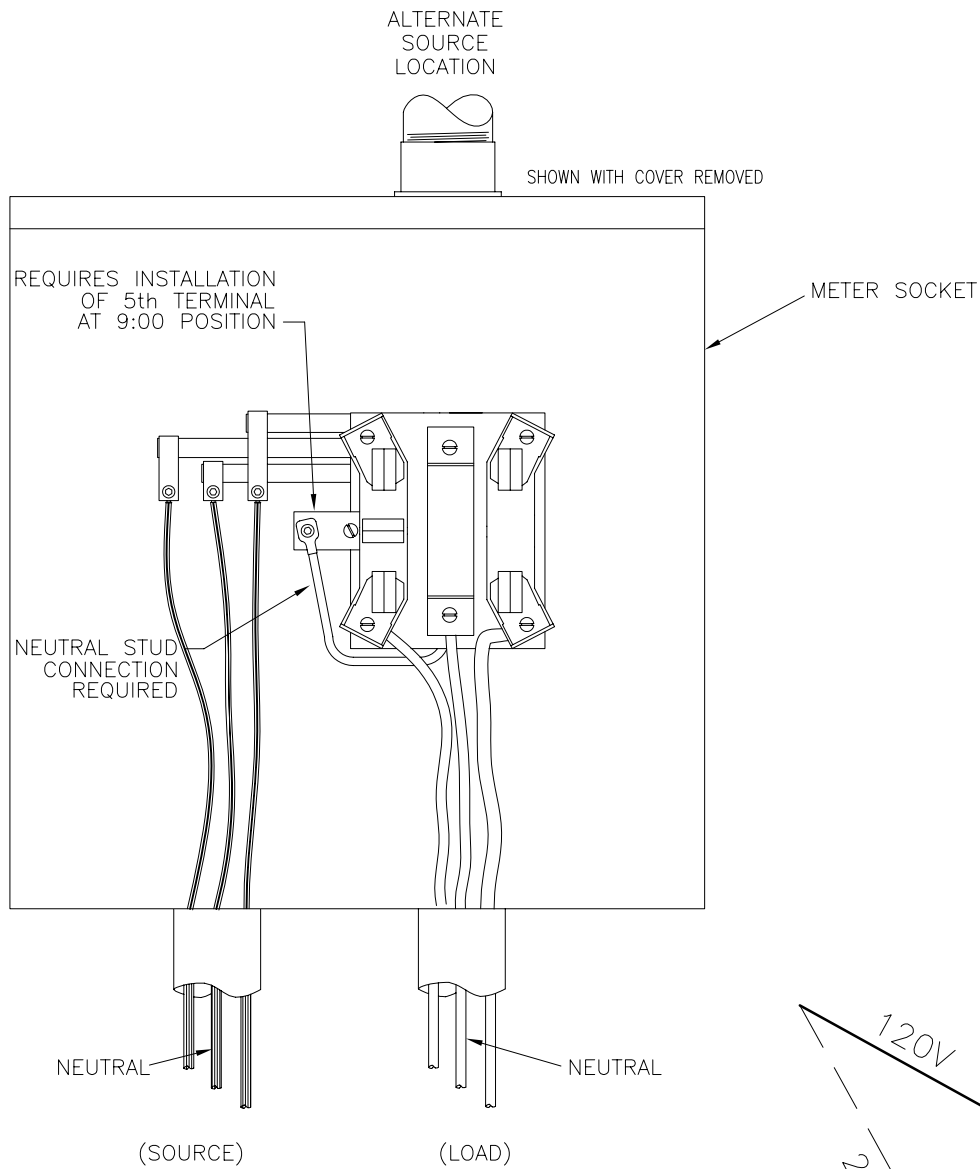
REV.

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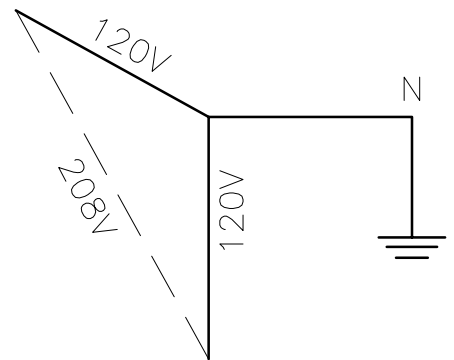
EXHIBIT 14

DATE

12/07



NETWORK 208Y/120 VOLT – 3 WIRE



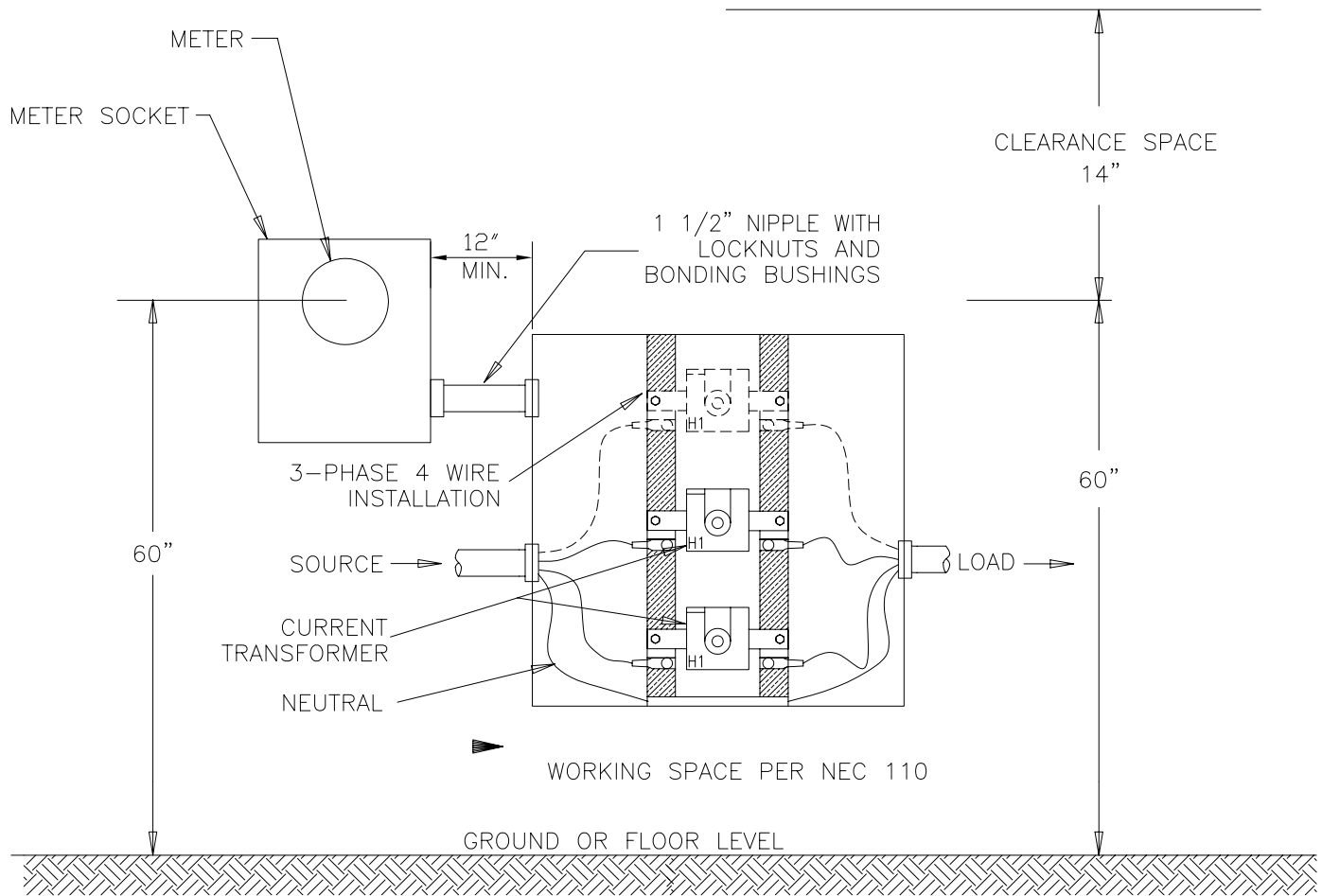
NOTES:

1. METER LOCATIONS SHALL BE APPROVED BY COMPANY.
2. CUSTOMER SERVICE EQUIPMENT SHALL BE GROUNDED PER NEC 250.
3. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
4. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

**METERING INSTALLATION – INDOOR/OUTDOOR
THREE-WIRE NETWORK 208Y/120 V**

FirstEnergy.

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NOTES:

1. BOND AND GROUND ACCORDING TO NEC 250.
- ▶ 2. PROVIDE WORKING SPACE PER NEC 110.
3. MOUNT H1 TOWARD SOURCE.
4. PHASE ROTATION 1-2-3 TOP TO BOTTOM OR LEFT TO RIGHT.
5. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
6. CUSTOMER MAY BE REQUIRED TO PROVIDE A TELEPHONE LINK TO THE METER SOCKET LOCATION. CONTACT THE REGIONAL METER MANAGER.
7. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 20.
8. CT CABINET TO BE INSTALLED ON EXTERIOR BUILDING WALL, UNLESS APPROVED BY REGIONAL METER SERVICES MANAGER.
9. NO CONDUITS SHALL ENTER TOP OF CT CABINET.

**METERING INSTALLATION – INDOOR/OUTDOOR
WITH CURRENT TRANSFORMERS
CT CABINET DETAILS**

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Service Guide

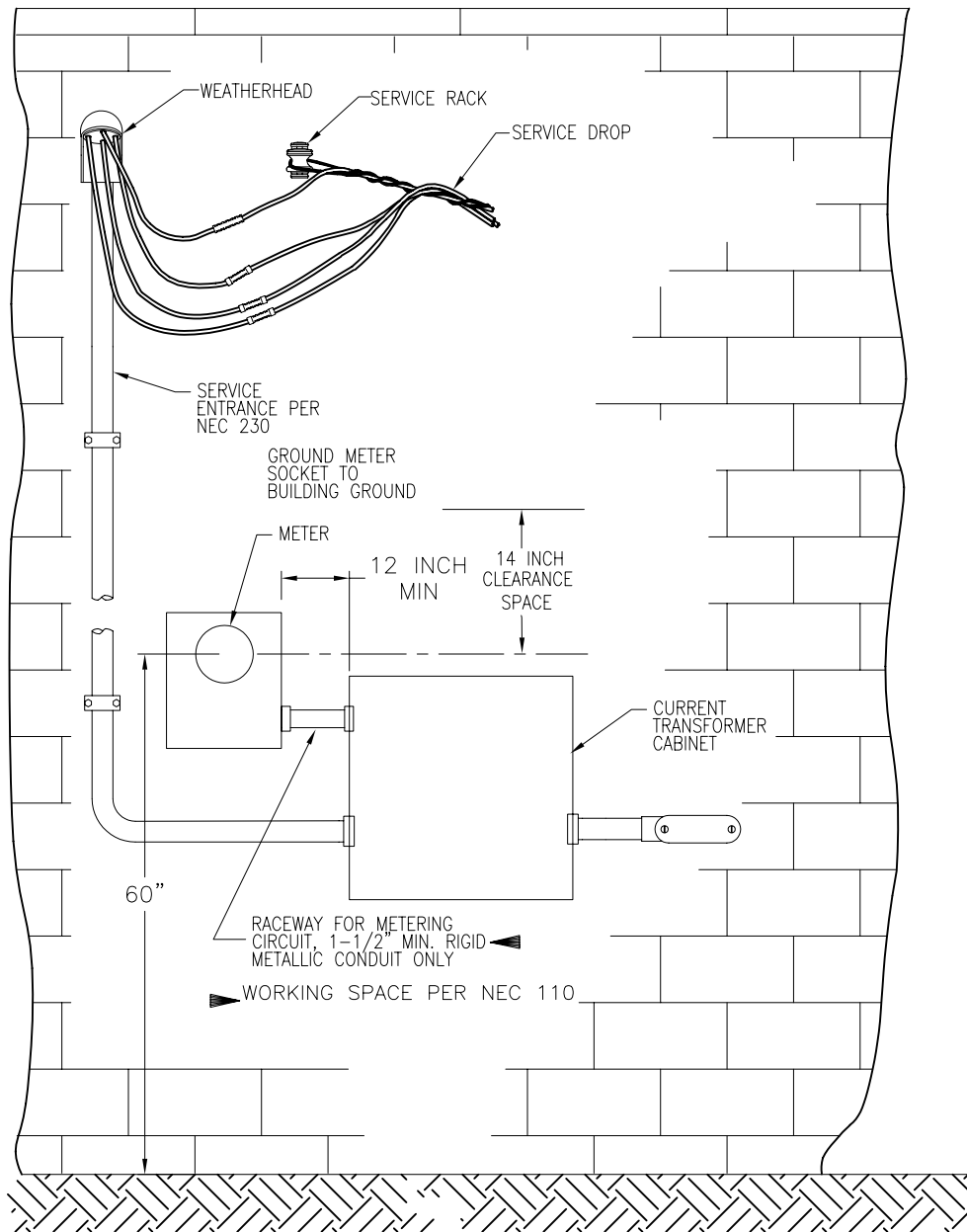
REV.

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EXHIBIT 16

DATE

12/07



NOTES:

1. BOND AND GROUND ACCORDING TO NEC 250.
2. PROVIDE WORKING SPACE AS SPECIFIED IN NEC 110.
3. METER SOCKET MAY BE CONNECTED TO AN EXTERNAL GROUND ROD IF REQUIRED BY LOCAL INSPECTION AUTHORITIES.
4. CUSTOMER MAY BE REQUIRED TO PROVIDE A TELEPHONE LINK TO THE METER SOCKET LOCATION. CONTACT THE METER MANAGER.
5. WHERE METER IS EXPOSED TO VEHICLE TRAFFIC, CUSTOMER SHALL INSTALL PROTECTIVE BUMPER POSTS 36" FROM METER. POST SHALL BE 6" RIGID GALVANIZED STEEL PIPE FILLED WITH CONCRETE AND PAINTED BRIGHT YELLOW.
6. CT CABINET TO BE INSTALLED ON EXTERIOR BUILDING WALL.
(FOR INDOOR CT CABINET INSTALLATIONS, CONTACT THE REGIONAL METER SERVICES MANAGER)
7. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 20.
8. NO CONDUIT SHALL ENTER TOP OF CT CABINET.

**METERING INSTALLATION
OUTDOOR CT CABINET
MOUNTED ON A BUILDING**

FirstEnergy.

Service Guide

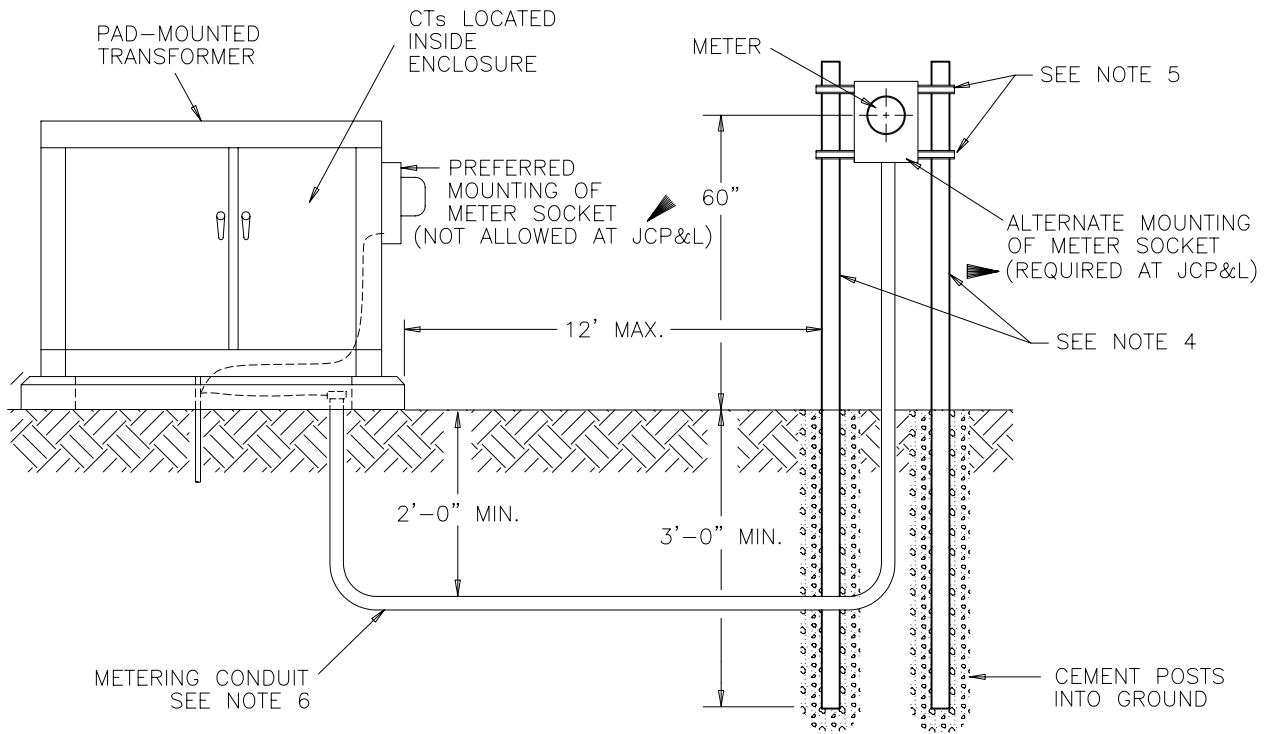
REV.

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EXHIBIT 17

DATE

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NOTES:

1. CONSULT COMPANY FOR TRENCH TERMINATION POINT AND LENGTH OF ADDITIONAL CABLE TO BE PROVIDED FOR FINAL CONNECTION BY COMPANY.
2. THE PREFERRED METER SOCKET MOUNTING IS ON THE TRANSFORMER CABINET (NOT ALLOWED AT JCP&L). IF THIS IS NOT FEASIBLE, APPROVAL SHALL BE OBTAINED FROM THE COMPANY TO USE A STAND ALONE METER INSTALLATION AS DESCRIBED ON THIS PAGE. THE STAND ALONE METER INSTALLATION IS REQUIRED AT JCP&L.
3. ALL DIMENSIONS NOT DEFINED ARE VARIABLE TO ACCOMMODATE METERING APPARATUS.
4. SUPPORT POST – USE ANY OF THE FOLLOWING:
 - 2–3” MIN. STEEL PIPE CAPPED AND CEMENTED IN GROUND
 - 2–4” MIN. PVC SCHEDULE 80 CEMENT FILLED AND CEMENTED IN GROUND
 - 2–3” MIN. CHANNEL IRON CEMENTED IN GROUND
5. MOUNTING HARDWARE – TWO 12 GAUGE 1–5/8” X 1–5/8” CONTINUOUS SLOT HOT DIPPED GALVANIZED CHANNEL (e.g., UNISTRUT) COMPLETE WITH 1–1/4” X 5/16” DIA. 13 THD SPRING NUT (2 PER CHANNEL), 5/16” HEX NUT, AND LOCK WASHER SECURELY MOUNTED TO SUPPORT POSTS.
6. METERING CONDUIT – USE 1–1/2” MIN. GALVANIZED RIGID METALLIC CONDUIT WITH ALL THREADED JOINTS AND INSULATED BONDING BUSHINGS ON BOTH ENDS. CONDUIT SHALL BE GROUNDED AT THE TRANSFORMER.
7. WHEN MOUNTED ON TRANSFORMER CABINET, METER SOCKET SHALL BE LOCATED 6” FROM TOP OF CABINET AND 6” FROM THE FRONT EDGE.
8. CUSTOMER MAY BE REQUIRED TO PROVIDE A TELEPHONE LINK TO THE METER SOCKET LOCATION. CONTACT THE REGIONAL METER DEPARTMENT.
9. WHERE METER IS EXPOSED TO VEHICLE TRAFFIC, CUSTOMER SHALL INSTALL PROTECTIVE BUMPER POSTS 36” FROM METER. POSTS SHALL BE 6” RIGID GALVANIZED STEEL PIPE FILLED WITH CONCRETE AND PAINTED BRIGHT YELLOW.
10. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 20.

THIS EXHIBIT IS NOT APPLICABLE FOR MET-ED.

**UNDERGROUND SECONDARY SERVICE
IN PAD-MOUNTED TRANSFORMER
WITH CURRENT TRANSFORMERS**

FirstEnergy.

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1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Ohio Edison	Ohio Edison
Service Entrance	Customer	Customer
Connectors @ meter socket	Customer	Customer
Meter Socket 200 Amp or less	Customer	Customer
Meter Socket 320 Amp	Ohio Edison	Customer
▶ 480 Volt Meter Disconnecting Means ¹	Customer	Customer
Meter	Ohio Edison	Ohio Edison

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral (Cable)	Customer	Customer
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
Riser – Conduit	Customer	Customer
Connectors @ Source Transformer or Handhole	Residential – Ohio Edison Commercial - Customer	Ohio Edison
Connectors @ Meter Socket	Customer	Customer
Meter Socket 200 Amp or less	Customer	Customer
Meter Socket 320 Amp	Ohio Edison	Customer
▶ 480 Volt Meter Disconnecting Means ¹	Customer	Customer
Meter	Ohio Edison	Ohio Edison

Note:

- ▶ 1. For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. See [Exhibit 22](#) for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH SELF-CONTAINED METERING
OHIO EDISON

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EXHIBIT 19A

Date

12/07

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Illuminating Co.	Illuminating Co.
Service Entrance ¹	Customer	Customer
Connectors @ meter socket	Customer	Customer
Meter Socket 200 Amp or less	Customer	Customer
Meter Socket 320 Amp	Illuminating Co.	Customer
▶ 480 Volt Meter Disconnecting Means ²	Customer	Customer
Meter	Illuminating Co.	Illuminating Co.

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral (Cable)	Customer	Customer
Trench / Backfill	Customer	Customer
Service Entrance ¹	Customer	Customer
Riser – Conduit / U-Guard ¹	Customer	Customer
Connectors @ Source Transformer or Handhole	Customer	Illuminating Co.
Connectors @ Meter Socket	Customer	Customer
Meter Socket 200 Amp or less	Customer	Customer
Meter Socket 320 Amp	Illuminating Co.	Customer
▶ 480 Volt Meter Disconnecting Means ²	Customer	Customer
Meter	Illuminating Co.	Illuminating Co.

Note:

1. The Illuminating Company offers Service Installation on Customer Service entrances. Please inquire with a Service Representative for additional details.

▶ 2. For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. See [Exhibit 22](#) for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH SELF-CONTAINED METERING
THE ILLUMINATING COMPANY

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EXHIBIT 19B

Date

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1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Penn Power	Penn Power
Service Entrance	Customer	Customer
Connectors @ meter socket	Customer	Customer
Meter Socket 320 Amp or less	Customer	Customer
▶ 480-Volt disconnecting Means ²	Customer	Customer
Meter	Penn Power	Penn Power

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral (Cable)	Residential - Penn Power Commercial - Customer	Residential - Penn Power Commercial – Customer (in ground) / Penn Power ¹ (on riser)
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
Riser - Conduit / U-Guard	Residential - Penn Power Commercial - Penn Power ¹	Residential - Penn Power Commercial - Penn Power ¹
Connectors @ Source Transformer or Handhole	Residential - Penn Power Commercial - Customer	Penn Power
Connectors @ Meter Socket	Customer	Residential - Penn Power Commercial - Customer
Meter Socket 320 Amp or less	Customer	Customer
▶ 480-Volt disconnecting Means ²	Customer	Customer
Meter	Penn Power	Penn Power

Note:

1. Penn Power buys riser material and installs cable and riser on the pole. Commercial customer pays for the fully loaded installed cost of installation.
- ▶ 2. For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. See [Exhibit 22](#) for details.
- ▶ 3. For three-phase, four-wire 120/240-volt delta services, the "high leg" conductor (nominally 208 volts phase to ground) must be installed on the right side of the meter socket and identified per NEC requirements. Contact Penn Power for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH SELF-CONTAINED METERING
PENN POWER

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EXHIBIT 19C

Date

12/07

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service drop w/ connectors	Toledo Edison	Toledo Edison
Service entrance	Customer	Customer
Connectors @ meter socket	Customer	Customer
Meter socket 200 amp or less	Customer	Customer
Meter Socket 320 amp	Toledo Edison	Customer
480-volt meter disconnecting means ³	Customer	Customer
Meter	Toledo Edison	Toledo Edison

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service lateral (cable)	▶ Customer	▶ Customer
Trench / backfill	Customer	Customer
Service entrance	Customer	Customer
▶ Riser - conduit	▶ Customer	▶ Customer
▶ Connectors @ source transformer	Toledo Edison ¹ / ▶ Customer ²	▶ Toledo Edison ¹ / Customer ²
▶ Connectors @ source handhole /pedestal	Toledo Edison	Toledo Edison
▶ Connectors @ meter socket	▶ Customer	▶ Customer
Meter socket 200 amp or less	Customer	Customer
Meter socket 320 amp	Toledo Edison	Customer
▶ 480-volt meter disconnecting means ³	Customer	Customer
Meter	Toledo Edison	Toledo Edison

Note:

- ▶ 1. If using Toledo Edison connectors, cable size is limited to 600 kcmil.
- ▶ 2. If connecting to a transformer equipped with secondary spades, Customer shall supply and install 2-hole NEMA connectors to their service lateral cable. Toledo Edison will make the final electrical connection.
- ▶ 3. For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. See [Exhibit 22](#) for details.

SERVICE MATERIAL GUIDELINE APPLICATIONS WITH SELF-CONTAINED METERING TOLEDO EDISON

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EXHIBIT 19D

Date

11/09

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ Connectors	JCP&L	JCP&L ¹
Service Entrance	Customer	Customer
Connectors @ Meter Socket	Customer	Customer
Meter Socket 320 Amps or less	Customer	Customer
▶ 480 Volt Meter Disconnecting Means ⁴	Customer	Customer
Meter	JCP&L	JCP&L

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral (Cable)	Residential – Customer ³ / JCP&L ² Commercial - Customer	Residential – Customer ³ / JCP&L ² Commercial – Customer ³
Trench / Backfill (In URD Developments)	Developer Option / JCP&L	Developer Option / JCP&L
Trench / Backfill (Not in URD Developments)	Customer	Customer
Riser - Conduit ^{2,3}	Customer	First 10 ft by Customer / remaining by JCP&L)
Service Entrance	Customer	Customer
Connectors @ Pad-mounted Transformer or Handhole (for Connectors @ OH Transformer – see Note 3)	Residential – JCP&L Commercial - Customer	Residential – JCP&L Commercial - Customer (Customer installs connectors on cable. JCP&L makes final connection of cables to JCP&L equipment.
Connectors @ Meter Socket	Customer	Customer
Meter Socket 320 Amp or less	Customer	Customer
▶ 480 Volt Meter Disconnecting Means ⁴	Customer	Customer
Meter	JCP&L	JCP&L

Note:

1. In most overhead single-phase service upgrades to 200 amp and below, the customer's electrician may do the disconnect / re-connect at the service weatherhead. Contact JCP&L for details and limitations.
2. JCP&L provides / installs service lateral in new URD developments of three (3) or more lots. In other cases, contact JCP&L.
3. If service lateral from pole, see EXHIBIT 6B for Direct Attachment and EXHIBIT 7B for Standoff Attachment details. Contact JCP&L for type and location of attachments.
- ▶ 4. For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. See [Exhibit 22](#) for details.
- ▶ 5. For three-phase, four-wire 120/240-volt delta services, the "high leg" conductor (nominally 208 volts phase to ground) must be installed on the right side of the meter socket and identified per NEC requirements. Contact JCP&L for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH SELF-CONTAINED METERING
JERSEY CENTRAL POWER & LIGHT

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EXHIBIT 19E

Date

12/07

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Met-Ed	Met-Ed
Service Entrance	Customer	Customer
Connectors @Meter Socket	Customer	Customer
Meter Socket 320 Amp or less ³	Customer	Customer
▶ 480 Volt Meter Disconnecting Means ⁵	Customer	Customer
Meter	Met-Ed	Met-Ed

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral (Cable)	Residential - Met-Ed Commercial - Customer	Residential - Met-Ed ¹ Commercial-Customer / Met-Ed ²
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
Riser – Conduit / U-Guard	Residential - Met-Ed Commercial - Customer / Met-Ed ²	Residential - Met-Ed Commercial-Customer / Met-Ed ²
Connectors @ Source Transformer or Handhole	Met-Ed	Met-Ed
Connectors @ Meter Socket	Customer	Residential - Met-Ed Commercial - Customer
Meter Socket 320 Amp or less	Customer	Customer
▶ 480-Volt Meter Disconnecting Means ⁵	Customer	Customer
Meter	Met-Ed	Met-Ed

Note:

- Met-Ed installs all direct buried cable. The customer is responsible for installing underground cable in conduit.
- Commercial Customer to supply & installs first 15 inches of conduit on pole. Met-Ed installs the remainder.
- Single-phase installations shall be 100-amp minimum unless approved by Regional Meter Services Manager. This includes service to sign boards, flashing lights, cable TV amplifiers, traffic signals, etc.
- Meter socket may not be located within 3 feet of gas meters or within 8 feet of facilities having combustible properties.
- ▶ For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. See [Exhibit 22](#) for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH SELF-CONTAINED METERING
MET-ED

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EXHIBIT 19F

Date

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1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Penelec	Penelec
Service Entrance	Customer	Customer
Connectors @ Meter Socket	Customer	Customer
Meter Socket 320 Amp or less	Customer	Customer
▶ 480-Volt Meter Disconnecting Means ²	Customer	Customer
Meter	Penelec	Penelec

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral (Cable)	Residential – Penelec Commercial – Customer	Residential – Penelec Commercial – Customer ¹
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
Riser – Conduit	Penelec	Penelec
Connectors @ Source Transformer or Handhole	Residential – Penelec Commercial – Customer	Penelec
Connectors @ Meter Socket	Customer	Residential – Penelec Commercial – Customer
Meter Socket 320 Amp or less	Customer	Customer
▶ 480-Volt Meter Disconnecting Means ²	Customer	Customer
Meter	Penelec	Penelec

Note:

- Customer installs to the pole, Penelec installs conduit and service lateral on the pole.
- ▶ For all single-phase and three-phase 480-volt services with self-contained metering, a disconnecting means is required on the source side of the meter socket. See [Exhibit 22](#) for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH SELF-CONTAINED METERING
PENELEC

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EXHIBIT 19G

Date

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1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Ohio Edison	Ohio Edison
Service Entrance	Customer	Customer
Current Transformers	Ohio Edison	Customer
CT cabinet (if applicable)	Customer	Customer
Metering Conductors	Ohio Edison	Ohio Edison
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	Ohio Edison	Customer
Meter	Ohio Edison	Ohio Edison

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral	Customer	Customer
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
▶ Riser - Conduit	▶ Customer	▶ Customer
Connectors @ transformer or Hand hole	Customer	Ohio Edison
Connectors @ service equipment	Customer	Customer
Current Transformers	Ohio Edison	Customer ¹
CT cabinet (if applicable)	Customer	Customer
Metering conductors	Ohio Edison	Ohio Edison
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	Ohio Edison	Customer ¹
Meter	Ohio Edison	Ohio Edison

Note:

- Ohio Edison will install when mounted on pad-mounted transformer cabinet.

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APPLICATIONS WITH CURRENT TRANSFORMERS
OHIO EDISON

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EXHIBIT 20A

Date

10/06

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Illuminating Co.	Illuminating Co.
Service Entrance ¹	Customer	Customer
Current Transformers	Illuminating Co.	Illuminating Co.
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Illuminating Co.	Illuminating Co.
Metering Conduit ¹	Customer	Customer
Transf. Rated Meter Socket	Illuminating Co.	Customer
Meter	Illuminating Co.	Illuminating Co.

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral ¹	Customer	Customer
Trench / Backfill	Customer	Customer
Service Entrance ¹	Customer	Customer
▶ Riser - Conduit	▶ Customer	▶ Customer
Connectors @ Transformer or Handhole	Customer	Illuminating Co.
Connectors @ Service Equipment	Customer	Customer
Current Transformers	Illuminating Co.	Customer ²
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Illuminating Co.	Illuminating Co.
Metering Conduit ¹	Customer	Customer
Transf. Rated Meter Socket	Illuminating Co.	Customer ²
Meter	Illuminating Co.	Illuminating Co.

Note:

1. The Illuminating Company offers service installation of customer service entrances. Please inquire with a Company representative for additional details.
2. The Illuminating Co. will install when mounted on pad-mounted transformer cabinet.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH CURRENT TRANSFORMERS
THE ILLUMINATING COMPANY

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EXHIBIT 20B

Date

10/06

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Penn Power	Penn Power
Service Entrance	Customer	Customer
Current Transformers	Penn Power	Customer
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Penn Power	Penn Power
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	Penn Power	Customer
Meter	Penn Power	Penn Power

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral	Customer	Customer
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
Riser – Conduit	Customer	Customer
Connectors @ Transformer or Handhole	Customer	Penn Power
Connectors @ Service Point	Customer	Customer
Current Transformers	Penn Power	Customer ¹
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Penn Power	Penn Power
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	Penn Power	Customer ¹
Meter	Penn Power	Penn Power

Note:

1. Penn Power will install when mounted on pad-mounted transformer cabinet.
- ▶ 2. For three-phase, four-wire 120/240-volt delta services, the "high leg" conductor (nominally 208 volts phase to ground) must be installed on the top bus in the CT cabinet and identified per NEC requirements. Contact Penn Power for details.

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PENN POWER

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EXHIBIT 20C

Date

12/07

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service drop w/ connectors	Toledo Edison	Toledo Edison
Service entrance	Customer	Customer
Current Transformers	Toledo Edison	Toledo Edison
CT cabinet (if applicable)	Customer	Customer
Metering conductors	Toledo Edison	Toledo Edison
Metering conduit	Customer	Customer
Transfer rated meter socket	Toledo Edison	Customer
Meter	Toledo Edison	Toledo Edison

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service lateral (cable)	▶ Customer	▶ Customer
Trench / backfill	Customer	Customer
Service entrance	Customer	Customer
▶ Riser – Conduit	▶ Customer	▶ Customer
▶ Connectors @ source transformer	▶ Toledo Edison ¹ /Customer ²	▶ Toledo Edison ¹ /Customer ²
▶ Connectors @ source handhole/ pedestal	Toledo Edison	Toledo Edison
Connectors @ meter socket	▶ Customer	▶ Customer
Current Transformers	Toledo Edison	Toledo Edison
CT cabinet (if applicable)	Customer	Customer
Metering conductors	Toledo Edison	Toledo Edison
Metering conduit	Customer	Customer
Transfer rated meter socket	Toledo Edison	Customer ³
Meter	Toledo Edison	Toledo Edison

Note:

- ▶ 1. If using Toledo Edison connectors, cable size is limited to 600 kcmil.
- ▶ 2. If connecting to a transformer equipped with secondary spades, Customer shall supply and install 2-hole NEMA connectors to their service lateral cable. Toledo Edison will make the final electrical connection.
- 3. Toledo Edison will install when mounted on pad-mounted transformer cabinet.

SERVICE MATERIAL GUIDELINE APPLICATIONS WITH CURRENT TRANSFORMERS TOLEDO EDISON		
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1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	JCP&L	JCP&L
Service Entrance	Customer	Customer
Current Transformers	JCP&L	JCP&L
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	JCP&L	JCP&L
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	JCP&L	Customer
Meter	JCP&L	JCP&L

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral	Customer	Customer
Trench / Backfill	Customer	Customer
Riser – Conduit ¹	Customer	First 10 feet by Customer / remaining by JCP&L)
Service Entrance	Customer	Customer
Connectors @ Pad-mounted Transformer or Handhole (for Connectors @ OH Transformer – see Note ¹)	Customer	Customer (Customer installs connectors on cable. JCP&L makes final connection of cables to JCP&L equipment.
Connectors @ Service Equipment	Customer	Customer
Current Transformers	JCP&L	JCP&L
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	JCP&L	JCP&L
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	JCP&L	Customer
Meter	JCP&L	JCP&L

Note:

- ▶ 1. If service lateral extends from the pole, see Exhibit 6B for Direct Attachment and Exhibit 7B for Standoff Attachment details. Contact JCP&L for type and location of attachments.
- ▶ 2. When multiple customers are fed off the same service lateral, all single-phase and three-phase services with current transformers shall install a lockable, non-fusible disconnect switch (supplied, installed, & maintained by the customer) ahead of the CT cabinet to allow servicing of each individual customer. A non-fusible disconnect switch is not required for current transformer installations greater than 800 amps, provided that the service originates from a pad-mounted transformer or overhead transformer bank that is dedicated to serving only that customer. Contact JCP&L for details.
- ▶ For three-phase, four-wire 120/240-volt delta services, the "high leg" conductor (nominally 208 volts phase to ground) must be installed on the top bus in the CT cabinet and identified per NEC requirements. Contact JCP&L for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH CURRENT TRANSFORMERS
JERSEY CENTRAL POWER & LIGHT

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EXHIBIT 20E

Date

2/08

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ connectors	Met-Ed	Met-Ed
Service Entrance	Customer	Customer
Current Transformers	Met-Ed	Customer
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Met-Ed	Met-Ed
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	Met-Ed	Customer
Meter	Met-Ed	Met-Ed

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral -Residential	Met-Ed	Met-Ed
Service Lateral-Commercial	Customer	Customer
Riser Conduit	Met-Ed	Met-Ed
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
Connectors @ Transformer or Handhole (Residential)	Met-Ed	Met-Ed
Connectors @ Transformer or Handhole (Commercial)	Customer	Customer ¹
Connectors @ Service Equipment	Customer	Customer
Current Transformers	Met-Ed	Customer
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Met-Ed	Met-Ed
Metering Conduit	Customer	Customer
Transfer Rated Meter Socket	Met-Ed	Customer
Meter	Met-Ed	Met-Ed

Note:

1. Met-Ed will make final connection.
- ▶ 2. For all single-phase and three-phase 480-v services with current transformers, a lockable, non-fusible disconnect switch (supplied and installed by the customer) will be installed ahead of the meter. Exception: A non-fusible disconnect switch will not be required for current transformer installations greater than 800 amps, provided that the service originates from a pad-mounted transformer or overhead transformer bank that is dedicated to serving only that customer. Contact Met-Ed for details.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH CURRENT TRANSFORMERS
MET-ED

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EXHIBIT 20F

Date

12/07

1. Overhead Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Drop w/ Connectors	Penelec	Penelec
Service Entrance	Customer	Customer
Current Transformers	Penelec	Penelec
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Penelec	Penelec
Metering Conduit	Customer	Customer
Transf. Rated Meter Socket	Penelec	Customer
Meter	Penelec	Penelec

2. Underground Service

MATERIAL	SUPPLIED BY	INSTALLED BY
Service Lateral	Customer	Customer
Trench / Backfill	Customer	Customer
Service Entrance	Customer	Customer
▶ Riser – Conduit / U-Guard	▶ Penelec	▶ Penelec
Connectors @ transformer or Handhole	Customer	Penelec
Connectors @ Service Equipment	Customer	Customer
Current Transformers	Penelec	Penelec
CT Cabinet (if applicable)	Customer	Customer
Metering Conductors	Penelec	Penelec
Metering Conduit	Customer	Customer
Transf. Rated Meter Socket	Penelec	Customer ¹
Meter	Penelec	Penelec

Note:

1. Penelec will install when mounted on pad-mounted transformer cabinet.

SERVICE MATERIAL GUIDELINE
APPLICATIONS WITH CURRENT TRANSFORMERS
PENELEC

FirstEnergy

Service Guide

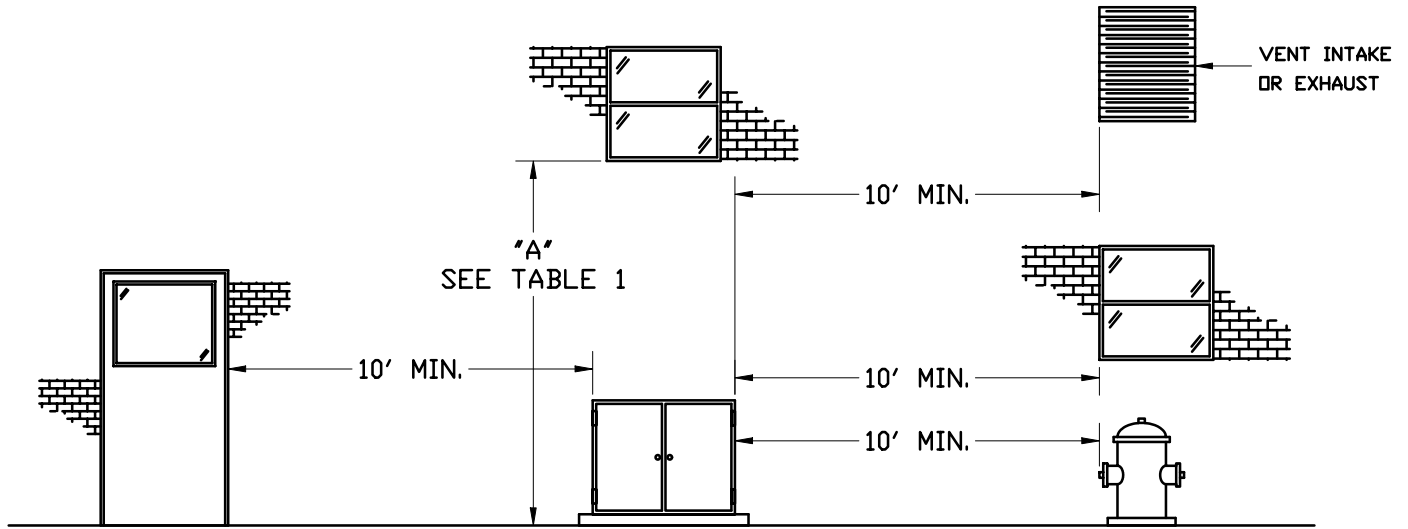
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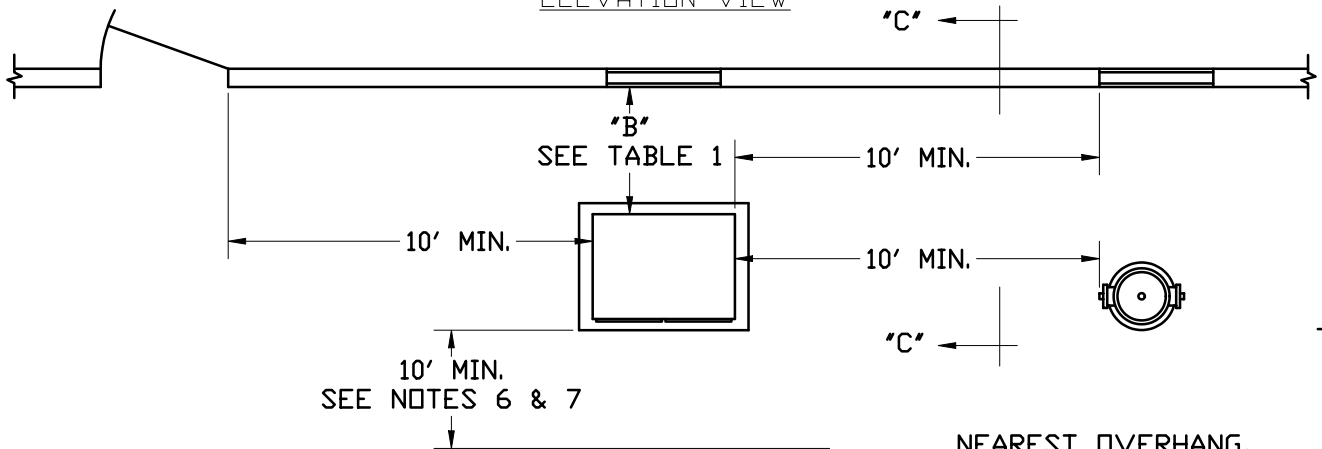
EXHIBIT 20G

Date

10/06



ELEVATION VIEW



PLAN VIEW

NEAREST OVERHANG, BALCONY, OR WINDOW

BUILDING SURFACE TYPE	MINIMUM DISTANCE "B" IN FEET TO BUILDING VERTICAL SURFACE	
	"A" > 18'	"A" ≤ 18'
STEEL OR MASONRY	4'	10'
WOOD, VINYL OR ALUMINUM	10'	10'

A=VERTICAL DISTANCE IN FEET TO NEAREST OVERHANG, BALCONY, OR WINDOW.

NOTES:

1. ADEQUATE PASSAGEWAYS SHALL BE PROVIDED TO ACCOMMODATE LINE TRUCKS OR OTHER NECESSARY LIFTING EQUIPMENT FOR MAINTENANCE OR REPLACEMENT.
2. BUILDING OVERHANGS OR BALCONIES SHALL NOT EXTEND OVER THE PAD-MOUNTED TRANSFORMER.
3. 10' MINIMUM CLEARANCE TO FIRE HYDRANTS ALSO APPLIES TO FIRE ESCAPES.
4. 10' MINIMUM CLEARANCE TO DOORWAYS ALSO APPLIES TO OPEN STAIRWAYS.
5. AREA AROUND PAD-MOUNTED TRANSFORMERS SHALL SLOPE AWAY FROM BUILDING.
6. FRONT OF PAD-MOUNTED TRANSFORMERS SHALL FACE AWAY FROM BUILDING. IF TRANSFORMER MUST FACE BUILDING, 10' CLEARANCE SHALL BE MAINTAINED.
7. NO SHRUBS, FENCES, OR OTHER PERMANENT OBJECTS SHALL BE SET WITHIN 3' FROM THE SIDES AND BACK AND 10' FROM THE FRONT OF PAD-MOUNTED TRANSFORMER.
8. CUSTOMER IS RESPONSIBLE TO COMPLY WITH ANY AND ALL BUILDING CODES, LOCAL ORDINANCES, AND INSURANCE REGULATIONS ASSOCIATED WITH THE TRANSFORMER INSTALLATION.

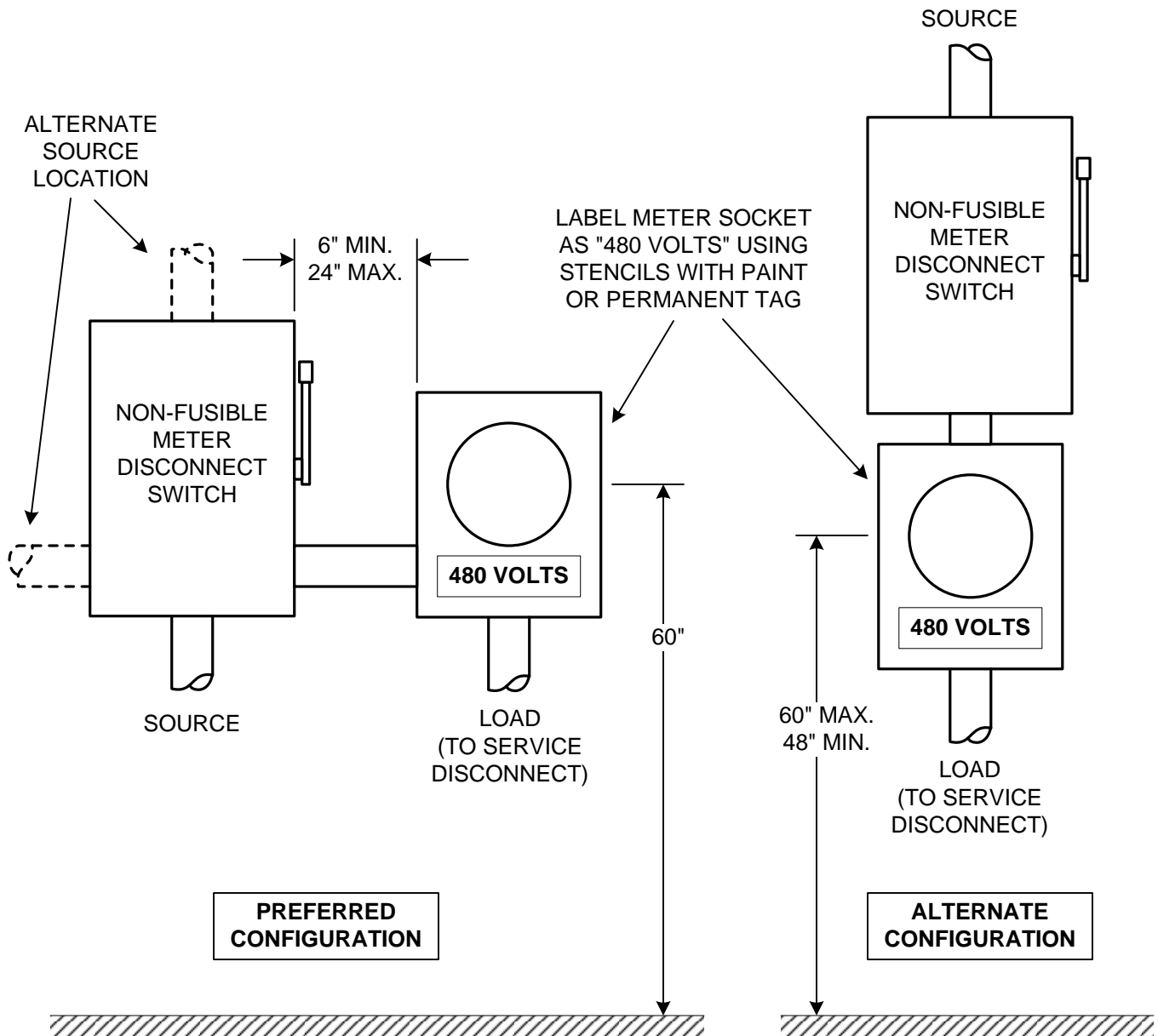
SEE NOTE 5

VIEW "C-C"

**RECOMMENDED MINIMUM CLEARANCES
FROM STRUCTURES FOR MINERAL
OIL-FILLED PAD-MOUNTED TRANSFORMERS**

FirstEnergy

Service Guide	REV.
EXHIBIT 21	DATE 6/05



NOTES:

1. CONTACT THE COMPANY'S METER SERVICES SECTION FOR DETAILS REGARDING THESE REQUIREMENTS AND TO OBTAIN APPROVAL FOR THE PROPOSED INSTALLATION.
2. THE NON-FUSIBLE METER DISCONNECT SWITCH MUST BE LOCKABLE IN THE OPEN AND CLOSED POSITIONS. THE SWITCH ENCLOSURE SHALL HAVE PROVISIONS FOR A COMPANY SEAL AND/OR PADLOCK.
3. THE COMPANY'S METER SERVICES SECTION MAY, IN SPECIAL CASES, ALLOW THE SERVICE DISCONNECT TO BE INSTALLED ON THE SOURCE SIDE OF THE 480-VOLT METER SOCKET. THIS ELIMINATES THE NEED TO INSTALL A SEPARATE DISCONNECT SWITCH AHEAD OF THE METER. THE SERVICE DISCONNECT ENCLOSURE MUST HAVE PROVISIONS FOR A COMPANY METER SEAL AND/OR PADLOCK. COMPANY METER SERVICES PERSONNEL SHALL BE PERMITTED TO OPERATE THIS SERVICE DISCONNECT WHEN REMOVING AND INSTALLING THE METER. ANY PLANNED OUTAGES INVOLVING OPERATION OF THIS SERVICE DISCONNECT MUST BE COORDINATED BETWEEN BOTH PARTIES. THE CUSTOMER WILL STILL OWN, INSTALL, AND MAINTAIN THE SERVICE DISCONNECT. CONTACT THE COMPANY FOR APPROVAL AND ADDITIONAL INFORMATION.
4. SEE EXHIBIT 8 FOR 480-VOLT GANG AND MULTIPLE SOCKET UNIT INSTALLATIONS.
5. FOR CUSTOMER/COMPANY RESPONSIBILITIES SEE COMPANY SPECIFIC SERVICE GUIDE EXHIBIT 19.

**METERING INSTALLATION -
SINGLE-PHASE AND THREE-PHASE 480 VOLT SELF-
CONTAINED METER WITH SOURCE-SIDE DISCONNECT**

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EXHIBIT 22

DATE

12/07

Trench Details – Direct Buried Cables

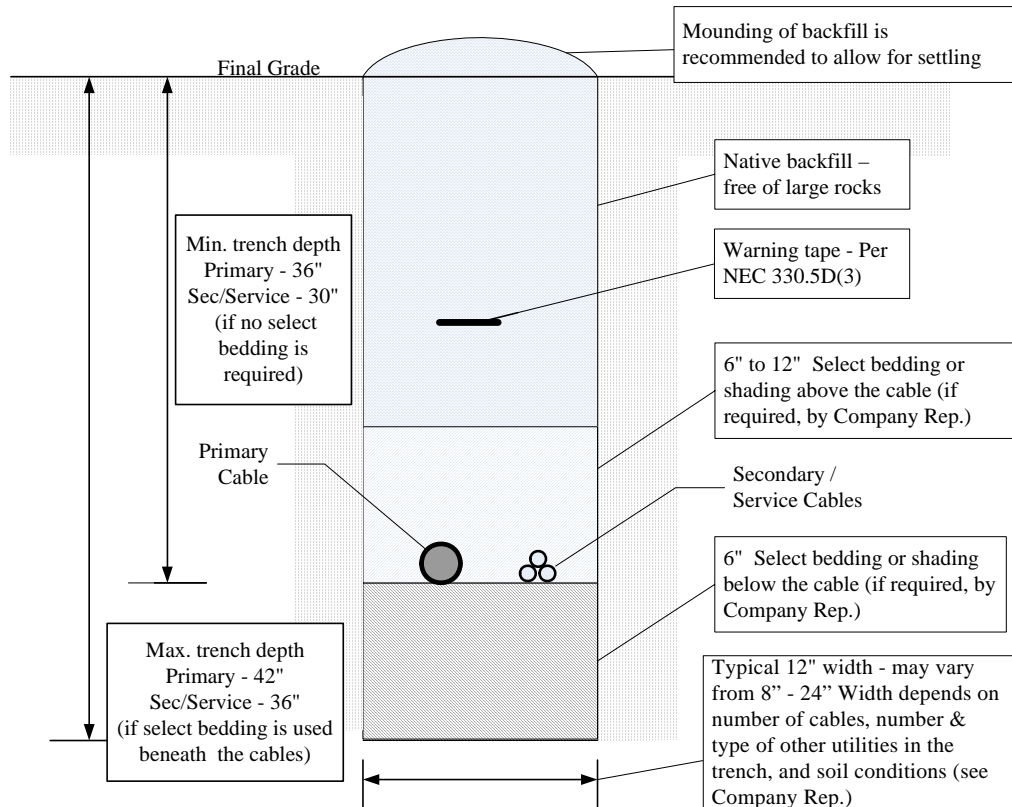


TABLE - MINIMUM COVER REQUIRED PER CODE (INCHES)

Owner / Code	Customer Installed Facilities / NEC ⁽¹⁾				Company / NESC
	Direct Buried	Rigid Metallic Conduit (RMC)	Rigid Nonmetallic Conduit (RNC)	Street / Road Parking Lot ⁽²⁾	Direct Buried
0 – 600 V	24	6	18	24	24
> 600 V – 22 kV	30	6	18	24	30
> 22 kV – 40 kV	36	6	24	24	30

Notes: (1) FEOC typically requires an additional 6 inches of cover to allow for variation in final grade.

(2) For cables located beneath roads under Penn DOT jurisdiction, cables must be installed in conduit and have a minimum of 36 inches of cover.

TRENCH DETAILS FOR DIRECT BURIED CABLES

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EXHIBIT 23

Date

11/09