

2017 EDITION Guidebook of Requirements for Electric Service

“SAFETY
FIRST”



TABLE OF CONTENTS

1. General Information	1
1.1 Introduction	1
1.2 Policies & Procedures	1
1.3 Safety	1
1.4 Electrical Codes	2
1.5 Effective Date & Revisions	3
1.6 Consultation	3
2. General Requirements for Service	4
3. Types of Service Available	6
3.1 Scope	6
3.2 Single- and Three-Phase Service from Pole-Mounted Transformers	8
3.3 Services from Padmount Transformers	9
3.4 Services from Transformer Vaults	9
3.5 Temporary Service	11
3.6 Primary Voltage Services	11
4. Request for Electric Service	11
4.1 General Service Information	12
4.2 Residential Overhead Service Drops	12
4.3 All Other Service Drops & Laterals	13
4.4 Residential Developments	14
4.5 Commercial & Industrial Developments	15
4.6 Service Request Dos and Don'ts	16
5. Design Criteria & Construction Practices	16
5.1 Overhead and Underground Services	16
5.2 Road Crossing Poles	19
5.3 Private Line Poles (PLP)	20
5.4 Cut & Reconnect Policy	20
5.5 Buildings Vacant for Periods Greater Than Six Months	23
5.6 Demolition	23
5.7 Service to PCS Towers	24
6. Motors	25
6.1 General Requirements	25
6.2 Protective Devices	25
6.3 Single-Phase Motors	26
6.4 Three-Phase Motors	26
7. Emergency Interruption of Service & Emergency Generators	26
7.1 Interruption of Service	26
7.2 Emergency Generators	27

8. Alternate Energy Source.....27
8.1 Parallel Generation.....27
8.2 Uninterruptible Power Supply (UPS).....27

9. Quality of Service28
9.1 Voltage Regulation.....28
9.2 Non-Linear Loads.....29

10. Metering.....29
10.1 General Requirements.....29
10.2 Metering Installation Requirements30
10.3 Metering Equipment.....38

11. Energy Diversion/Theft of Service.....42
11.1 General Requirements.....42
11.2 Refusal or Discontinuance of Service42
11.3 Jumpered Metering44

12. Service Materials Available at Town Halls.....44

13. Guidebook Standards.....45

Appendix A – DEFINITIONS72

1. GENERAL INFORMATION

1.1 Introduction

This Guidebook provides a cursory view of the policies and procedures of UI and is intended for use by our customers, electrical contractors, consulting engineers, architects and electrical inspectors. We present this Guidebook in an effort to acquaint you with the various types of electric services that are offered by UI and to help you determine which is best suited for your individual needs. This booklet mainly deals with low voltage services (480 volts and below). Primary service voltages above 480 volts are supplied by special contract, and additional information is available on request. We at UI look forward to working with you to meet all your electrical energy and service requirements.

NOTE: Section 10.3 contains a list of attributes, characteristics and specifications for approved metering equipment. UI no longer specifies catalog numbers.

1.2 Policies & Procedures

UI supplies electricity subject to our *Terms and Conditions* and our *Rate Schedules* on file with the Connecticut Public Utilities Regulatory Authority (PURA). While our policies and procedures follow accepted industry practices and standards, they are not necessarily the same as the requirements adopted by the other electric utilities that adjoin our territory. UI policies and procedures are available upon written request and online. Where UI and other specified agencies are named in this book, all policies and requirements are to remain valid for future names of the same entity.

1.3 Safety

- A. The safety of UI personnel and others who work on and/or around our equipment, as well as the safety of the general public, is our most important concern. Do not approach any downed or exposed wire, cable or other equipment as any contact may cause injury or death. Please report any problems immediately to UI at **800-722-5584**.
- B. UI designs, builds and operates its electric system in accordance with the applicable Connecticut General Statutes, Occupational Safety & Health Administration (OSHA) regulations, the National Electrical Safety Code (NESC) and to UI's own safety rules. Only authorized personnel are allowed to work on utility poles and equipment.

- C. UI reserves the right to refuse to energize a new service or to de-energize an existing service that violates UI safety rules regardless of whether it meets electrical or building codes.
- D. People working with equipment such as ladders, scaffolding, backhoes, dump trucks, cranes, etc. should use extreme caution when working near UI power lines. Contact with these lines may result in the electrification of you and/or your equipment and may cause injury or death. Please maintain a minimum of 10 feet from UI power lines. For additional information, please refer to OSHA regulations and contact UI at **800-722-5584**.
- E. People doing any excavation near buried power cables should use extreme caution. State law requires that you contact **CALL BEFORE YOU DIG** at **811** or **800-922-4455** a minimum of two full business days before starting any excavation.

1.4 Electrical Codes

- A. UI designs, builds and operates its electric system in accordance with the latest revision of the National Electrical Safety Code (NESC). The requirements of this code are incorporated in our Company Standards. For new construction and renovations, certain customer-owned facilities fall under the jurisdiction of the NESC and must also comply with this code.
- B. Customer-owned facilities are built in accordance with the latest approved version of the National Electrical Code (NEC) and the latest versions of the Building and Fire Safety Codes that have been adopted by the State of Connecticut Department of Public Safety. Approval by the authority having jurisdiction must be received by UI and posted in our system before any new or renovated or substantially repaired electric service can be energized.
- C. Where there is a conflict with the requirements of UI, the NESC and the NEC, the more stringent requirements shall prevail. If necessary, UI and the authority having jurisdiction will jointly confer. UI reserves the right to make all final determinations.

1.5 Effective Date & Revisions

The effective date of this booklet is Jan. 1, 2017, and supersedes all previous issues. All construction started on or after this date must comply with these requirements. Allowance will be made for projects currently in construction or service requests previously submitted to UI. UI reserves the right to change the requirements of the booklet without notification based on changes to our policies and procedures, terms and conditions, industry standards and codes, etc. When planning a project, it is your responsibility to verify the latest requirements of UI.

NOTE: Do not start any project without first consulting with UI and the Building Department of your municipality.

1.6 Consultation

It is impractical for a booklet of this type to contain all the information necessary to cover all variations and possibilities of service installation. Our Customer Care Center Representatives are available to assist you in determining the appropriate method of service for your needs. Our Customer Care Center acts as a clearinghouse for all customer requests and will direct your questions to the appropriate department. We urge you to contact them at your earliest convenience. We are confident that doing so will result in greater satisfaction and will avoid unnecessary delays.

Our Standard Field Department is responsible for coordinating all 200 A and below, single-phase, overhead services for residential customers where UI facilities are already in place. This includes temporary services to construction trailers that meet the above criteria. In addition, Standard Field is responsible for coordinating all service removals for building demolitions.

Our Engineering Department is responsible for coordinating all services where additional poles and wires are needed, all residential overhead services over 200 A, all underground residential services and all commercial/industrial services.

Our Distributed Energy Resources Department facilitates the safe, reliable interconnections of parallel generation on the distribution system.

Our Economic Development Department is available to assist you with the attraction, retention and/or expansion of your business in our service territory. This includes coordinating contact with state and municipal representatives, real estate developers and financial institutions.

Our Energy Conservation Department offers technical assistance, consulting services and incentives at every phase of your construction or retrofit project encouraging the design, construction and operation of energy-efficient buildings and equipment. This assistance covers the major energy-consuming systems such as lighting, heating ventilation and air conditioning equipment (HVAC), refrigeration equipment, motors, air compressors, process equipment and building envelopes.

Below are the phone and fax numbers for the listed departments:

DEPARTMENT	PHONE #	FAX #
Customer Care Center	800-722-5584 Email: Customer.Service@uinet.com	888-442-6070
Standard Field	800-557-6603	203-499-3138
Engineering	800-557-6602	203-926-4525
Economic Development	203-499-3777	203-499-2491
Distributed Energy Resources		203-903-0966 Email: Generator.Connection@uinet.com
Energy Conservation	877-947-3873	203-499-3611

Refer to Section 4, *Request for Electric Service* for detailed information about applying for service, or visit us on our website at uinet.com.

2. GENERAL REQUIREMENTS FOR SERVICE

- A. All requests for new service and changes to existing services must be ordered through our Customer Care Center either by phone, fax or the Internet. Call **800-722-5584** from 7 a.m. to 7 p.m. Monday through Friday and 7 a.m. to 4 p.m. on Saturday. You can fax your Electric Service Information Form to **888-442-6070** or apply on the Internet at uinet.com at any time. A UI job number will be assigned; this number is required to obtain a release from the authority having jurisdiction.

NOTE: Any request for new service or changes to existing service jobs which have no action for 180 days will be canceled, and the request process, if needed, will have to be repeated.

- B. All service requests must include the name and address of the party who will be responsible for paying the electric bill. The customer may be required to sign a Service Contract and, in some cases, make a deposit.

- C. All service requests are subject to UI approval. This includes the service location, voltage and phase characteristics, outdoor meter location and configuration, and other associated requirements.

NOTE: ALL new and renovated meter provisions MUST be located outdoors unless approved in writing. **Do not purchase any equipment or proceed with any construction until you have obtained these requirements from UI in writing.** To avoid problems and delays, this should be done early in the project planning stages.

- D. In general, service to a customer's premises will be delivered at a single point. If the capacity requirements to a single building or multiple buildings on a single parcel of land warrant additional service, both UI and the authority having jurisdiction must jointly grant approval. UI reserves the right to restrict the service to a single point of delivery or require additional payment for the cost to provide the additional service.
- E. When requested by UI: customers consultants or contractors shall complete a UI Load Information Form. This form provides greater details about the project (including the total connected load in kilowatts) and should be submitted to the Engineering Department. It augments and does not replace the service order placed through our Customer Care Center (see Paragraph A above).
- F. The characteristics of certain electrical equipment such as motors, inverter-based generators and non-linear loads may adversely affect your service and the operation of UI's electrical system. All adverse effects on UI's electrical system caused by customer equipment must be corrected by the customer at the customer's expense. For additional information, please reference Section 6 – Motors and Section 9 – Quality of Service. This incorporates solar, standby generators or any other alternative power generation methods.
- G. The company requires clear access to its facilities at all times and reserves the right to enter the customer's property to inspect, maintain and/or upgrade our equipment without notice. If access into a building is required, UI will make every attempt to do this during normal working hours or will make specific arrangements with the property owner. UI reserves the right to disconnect services as allowed by law.

- H. When the estimated expenditures of the company to provide service to a customer's premises exceed the estimated income to be derived from that service, additional payments by the customer may be required. The company may require the customer to pay, in advance, the estimated cost difference to provide such service or to guarantee a minimum annual payment for a term of years as stated in UI's Terms and Conditions (CUPCA No. 647, Item 4).
- I. Customers shall consult the company when contemplating changes in the size or electrical characteristics of their equipment. UI normally sizes its equipment to serve the actual electrical load of the customer and not the full potential load of the customer's service entrance equipment. UI must be notified of customer load increases in advance and be provided the opportunity to replace its equipment, if necessary, prior to the load increase. Damages to company equipment resulting from unauthorized changes shall be the responsibility of the customer.
- J. All wiring must comply with the latest approved version of the National Electrical Code and the latest versions of the Building and Fire Safety Codes that have been adopted by the State of Connecticut Department of Public Safety.

NOTE: UI will not schedule or energize any new or renovated service unless the release from the authority having jurisdiction is posted in our system. The contractor should make arrangements with the proper authority in advance to avoid delays.

3. TYPES OF SERVICE AVAILABLE

3.1 Scope

UI supplies 60 hertz, alternating current with different voltage and ampere ratings. Not all voltage and ampere ratings are available throughout the entire service territory of UI. All services are either single-phase, three wire or three-phase, four wire and the neutral conductor must be grounded in accordance with the National Electrical Code. Please contact our Engineering Department to verify that the requested service can be provided by UI prior to making any commitments or ordering any equipment.

- A. Single-phase, three-wire, 120/240 volt service is generally supplied to all residential customers and is typically available for all customers.
- B. Single-phase, three-wire, 120/208 volt service is only supplied when single-phase metered service is required and a three-phase 120/208Y volt source is available. Typically, this involves large apartment buildings, a condominium or an office complex, or service in the underground network area.

- C. Three-phase, four-wire delta (120/240/240 volt) service may be supplied for commercial and industrial customers provided that the minimum connected three-phase load is 5 KW and the minimum total demand is 10 KW. For pole mounted transformers, the minimum service size is 100 A and the maximum service size is 600 A.

This voltage is not available from padmount transformers.

- D. Three-phase, four-wire wye (120/208Y volt) service may be supplied for large residential projects and for commercial and industrial customers. For pole-mounted transformers, the minimum service size is 400 A with a minimum demand of 30 KW. For padmount transformers, the minimum service size is 600 A with a minimum demand of 65 KW.
- E. Three-phase, four-wire wye (277/480Y volt) service may be supplied for large commercial and industrial customers. For pole-mounted and padmount transformers, the minimum service size is 400 A with a minimum demand of 100 KW.
- F. Three-phase, three-wire delta (240 volt and 480 volt) service is no longer provided. For existing services with either of these voltages, please contact Engineering before planning any changes. Conversion to a three-phase, four-wire service may be required.
- G. Primary service voltages above 480 volts are supplied by special contract. Contact Engineering for additional information.

NOTES: When three-phase service is supplied, every effort should be made to balance the load among all three phases.

Three-phase service is not generally supplied for residential use but may be furnished if loads warrant and facilities are available. UI's Engineering Department shall be consulted prior to making commitments for any such service.

3.2

Single- and Three-Phase Service from Pole-Mounted Transformers

Maximum Service Size from Transformers Mounted on Poles

VOLTS	Main Switch Size and Equivalent KVA Ratings			Maximum Transformer Capacity Allowed on Poles (Note 1)	Size Main Allowed from Street Pole			
	400A	600A	800A		O.H.	U.G. by Cust. (Note 2)	O.H.	U.G. by Cust. (Note 2)
120/240 1 ϕ 3 Wire	96 KVA	N/A	N/A	100 KVA	400 A	400 A	400 A	400 A
120/240/240 3 ϕ 4 Wire (10 KW Min. Demand)	166 KVA	250 KVA	N/A	300 KVA	400 A	400 A	400 A	400A 600 A
240 3 ϕ 3 Wire	No longer available for new services. Contact UI's Engineering Department before making any additions or changes.							
120/208Y/ 3 ϕ 4 Wire (30 KW Min. Demand)	144 KVA	216 KVA	288 KVA	300 KVA	400 A	400 A	400 A	400 A 600 A 800 A
277/480Y 3 ϕ 4 Wire (100 KW Min. Demand)	332 KVA	N/A	N/A	300 KVA	(Note 3)	(Note 3)	400 A	400 A

NOTES:

- 3 ϕ 3 wire underground services (240V or 480V) are no longer available. Contact UI's Engineering Department before making any additions or changes to existing service.
- Conduit shall be no smaller than 1¼ inch nor larger than 4 inch in diameter. Location on the riser pole shall be designated by UI and is typically on the field side of the pole away from traffic. Do not trench to any pole without first obtaining approval from UI. A maximum of two conduits per pole is allowed for electric service and a maximum of three wires for single-phase and four wires for three-phase can be installed in each conduit. While allowed by NEC, UI does not allow doubled conductors in a single riser conduit. All riser pole conduits and sweeps to be rigid galvanized steel conduit and supported 3 inches clear of the pole. Install only the first vertical 10-foot length and provide the remaining conduit, brackets, weatherhead and grounding clamp for installation by UI. Service entrance conductors are supplied by the customer and must extend a minimum of three feet beyond the weatherhead to allow for a drip loop. Do not install conductors without UI assistance.
- 277/480Y services are not available from street poles (private property poles are required).

3.3

Services from Padmount Transformers

- A. The design, location, voltages and materials for underground services must be approved by UI prior to making any commitments. Please contact UI's Engineering Department for more information.
- B. The company has a residential policy (OP-D36) which states that the developer must provide all trenching required for the electrical system. Also, the developer must supply and install foundations and conduit to UI specifications. UI will then install the primary and secondary electric system. UI requires a permanent easement for this equipment. The customer for each individual lot will supply, install, own and maintain the service entrance cables and conduit. Voltages available are 120/240 volt single-phase and 120/208Y volt three-phase for large multi-unit housing. Contact UI's Engineering Department for more information.
- C. The company has a commercial/industrial policy (OP-D32) governing service to office or industrial parks. The developer must provide all trenching required for the electrical system. Also, the developer must supply and install foundations and conduit to UI specifications. UI will then install the electric system necessary to supply the individual lots. UI requires a permanent easement for this equipment. The services to the individual lots are installed under separate contracts. See Paragraph D below. Contact UI's Engineering Department for more information.
- D. For service to an individual commercial/industrial lot, the customer must supply, install, own and maintain all primary conduit, transformer foundations and the service entrance conduit and cables. The primary conduit shall be installed from the high voltage supply designated by UI to the transformer foundation per UI specifications. UI will install the primary cable and transformer and make all connections to company-owned equipment. Voltages available are single-phase, three-wire 120/240 volt (800 A max.) and three-phase, four-wire 120/208Y (3,000 A max.) or 277/480Y (2,500 A max.). Contact UI's Engineering Department for more information.

3.4

Services from Transformer Vaults

- A. The design, location, voltages and materials for these underground services must be approved by the company prior to making any commitments. Contact UI's Engineering Department for more information.

- B. For downtown New Haven or Bridgeport, the company has a policy (OP-D10N) for service from the network grid. Services up to 800 A at 120/208Y volts will be connected to the grid. The customer must pay for that portion of the service between the main switch or junction box and the curb. Services exceeding 800 A in total capacity at 120/208Y and all services rated 277/480Y cannot be connected directly to the network grid. In this case, the customer is required to install, own and maintain a vault to UI specifications. Voltages available are three-phase, four wire 120/208Y or 277/480Y, and are limited to 3000 A. (Refer to Guidebook Standards #8 and #9 in Section 13.)

NOTE: Other municipalities have underground systems in portions of their downtown areas (e.g., East Haven and Derby). Contact UI's Engineering Department for specific requirements for service in these areas.

- C. With the exception of single meter installations, the underground service conduit shall terminate in a junction or pull box supplied and installed by the customer. The junction or pull box shall meet both UI and National Electrical Code requirements and is subject to the approval of the authority having jurisdiction. The junction box will connect to the customer's main switch or switches. The minimum size of the box shall be based on the service size, and the conduit shall enter from the back or the end of the box. The service conductors shall not be spliced but may be tapped where multiple main switches are used. The junction or pull box shall have provisions for company locks and seals. Contact UI's Engineering Department for drawings of approved junction boxes.
- D. In each of the above cases, the service entrance disconnect must be either a switch with current limiting fuses or a circuit breaker of equivalent interrupting capacity. The short circuit capacity of these devices shall be not less than 200,000 A symmetrical for downtown network areas, and the service must be configured in cold sequence (i.e., switch-fuse-meter). For all other areas, contact UI's Engineering Department.
- E. Customers in non-network areas may be required to install, own and maintain a transformer vault to UI specifications. This occurs when the service entrance capacity requires the installation of transformers on the customer's property and there is not sufficient area for a padmount transformer. Voltages available are three-phase, four-wire 120/208Y (3,000 A max.) or 277/480Y (2500 A max.). The short circuit capacity of these devices shall be calculated by UI, and the service must be configured in cold sequence (i.e., switch-fuse-meter). Contact UI's Engineering Department for more information.

3.5 Temporary Service

- A. Temporary service is available upon request provided that the cost to install and remove the necessary facilities is paid in full and in advance by the customer. Contact United Illuminating, 100 Marsh Hill Rd., Orange, CT 06478.
- B. Where UI facilities are already in place- a single-phase temporary service can be supplied by a simple service drop or underground service lateral. A standard flat rate fee applies.
- C. For more complex temporary services, the Engineering Department will provide the customer with a written estimate of the cost associated with providing such service.
- D. Services that utilize temporary conductors connected to the load side of the meter provision must be applied for as a temporary service even if the permanent conductors are installed on the line side of the meter. This is billable at the current rate.

3.6 Primary Voltage Services

Primary voltage services are generally supplied by high voltage switchgear (either fused interrupters or circuit breakers) and are primary metered. Contact UI's Engineering Department for additional information.

4. REQUEST FOR ELECTRIC SERVICE

To establish electric service, temporary or permanent, contact UI's Customer Care Center by calling **800-722-5584** from 7 a.m. to 7 p.m., Monday through Friday, and 7 a.m. to 4 p.m. on Saturday. You may fax a completed Electric Service Information Form to **888-442-6070** (available 24 hours a day/7 days per week). You may also apply by completing an application on our website at **uinet.com**. Please request a service order and a meter application.

NOTE: Before UI can schedule or energize any new or renovated service, the authority having jurisdiction must approve the construction, and the acceptance of such construction must be posted in UI's system.

4.1 General Service Information

The following general service information is required on all applications:

- A. Project/Owner Name
- B. Number & Street Address, Town and Zip Code
- C. Lot # (if applicable) and nearest intersecting street
- D. Complete billing information including:
 - Owner's billing address and telephone number
 - Total number of meters requested
- E. Connecticut electrical contractor's license number (E-1/E-9)
- F. Electrical Contractor's cell phone number and email address
- G. Service information including:
 - Residential or Commercial/Industrial
 - Overhead or Underground
 - Service size in amperes
 - Requested service voltage
 - Single-phase (three-wire) or three-phase (four-wire)
 - Temporary or permanent
- H. Type of construction (new, replacement, increase, removal, demolition, cut tap or repair)
- I. Dates temporary and permanent service is required

4.2 Residential Overhead Service Drops

For single-phase residential overhead service drops rated 200 A and below, the following additional information is required by UI:

- A. Pole number of requested service pole
- B. Confirmation if the requested service pole has UI secondaries (yes/no)
- C. Number of pole spans from transformer to service pole
- D. Span distance (in feet) from service pole to service location

Where UI facilities are already in place, residential overhead service drops are typically designed and located by the customer's licensed electrical contractor. This includes temporary services to construction trailers that meet the above criteria (the standard flat rate fee for temporary service applies). Upon receiving complete information, UI will provide a job number immediately from our Customer Care Representative or by the next business day if you faxed in your request. Customer Electricians or trained field technicians are expected to determine the proper location for the service based on guidebook standards #1, 2, 3, 4, 10 and 12. If you have requested UI to "spot the service," then typically you will be contacted within five business days by the Standard Field Department.

Midspan service taps are nonstandard construction and generally not acceptable. Contact UI Engineering for other options.

4.3 All Other Service Drops & Laterals

The following are requirements for all other overhead service drops and underground service laterals, services where additional poles and wires are needed, all residential overhead services over 200 A, all underground services and all commercial/ industrial services:

- A. One complete set of an approved A2 survey plot plan showing topography, wetlands (if any), proposed location of other utilities, drainage, property boundaries, roads, sidewalks, driveways, location of buildings and desired service location. Street and property lines must be clearly and accurately marked at the project site.
- B. A completed UI electrical load information form.
- C. Construction start and completion dates.

You will not receive the UI job number until your request has been reviewed and the job requirements determined by the UI Engineering Department. Typically, you will be contacted by our engineer to discuss the job and/or arrange for a job site meeting within five business days of placing the order. The job requirements will be written by our engineer and sent to you with a copy of the service order by US mail or email.

Refer to Guidebook Standards #5, 6, 7, 8, 9, 11 and 13 in Section 13.

4.4 Residential Developments

Overhead line extensions and Underground Residential Distribution (URD) projects require more information, drawings and advance planning. Therefore, it is important that our Engineering Department obtain the following information:

- A. One complete set of an approved A2 survey plot plan showing topography, wetlands (if any), proposed location of other utilities, drainage, property boundaries, roads, sidewalks, driveways, location of buildings and desired service location. Street and property lines must be clearly and accurately marked at the project site.
- B. Name of real property owner and the approximate date property was purchased (obtain volume number, page number and date recorded, if available).
- C. Sizes (sq. ft.) and number of buildings, including the number of units per building and any house meters, if applicable. If this represents only a portion or section of the total development, indicate the total number of future buildings and units planned for the development.
- D. A completed UI electrical load information form for a typical unit or building.
- E. Construction start and completion dates.

UI needs six to eight weeks after receipt of complete information to prepare the necessary project documents and cannot install or energize any facilities until the necessary contracts are signed and all applicable easements have been recorded on the land records. These documents include:

- A. As-Planned Engineering Drawing with proposed UI facilities.
- B. As-Planned Easement Drawing with proposed easement strip.
- C. Responsibility Agreement/URD Contract.

4.5

Commercial & Industrial Developments

Commercial and industrial developments supplied by overhead power lines or underground cable systems require additional information, drawings and advance planning. Therefore, it is important that our Engineering Department obtain the following information:

- A. One complete set of an approved A2 survey plot plan showing topography, wetlands (if any), proposed location of other utilities, drainage, property boundaries, roads, sidewalks, driveways, location of buildings and desired service location. Street and property lines must be clearly and accurately marked at the project site.
- B. One complete set of the electrical series drawings, including the power riser or one-line diagram for the service(s), and any other drawings that detail trenching and conduit placement, transformer foundations, or other items relating to the service from UI's facilities to the customer's service entrance equipment.
- C. Name of real property owner and the approximate date property was purchased (obtain volume number, page number and date recorded, if available).
- D. Sizes (sq. ft.) and number of buildings, including the number of units per building and any house meters, if applicable. If this represents only a portion or section of the total development, indicate the total number of future buildings and units planned for the development.
- E. A completed UI electrical load information form for each service.
- F. Construction start and completion dates.

UI needs six to eight weeks after receipt of complete information to prepare the necessary project documents and cannot install or energize any facilities until the necessary contracts are signed and all applicable easements have been recorded on the land records. These documents include:

- A. As-Planned Engineering Drawing with proposed UI facilities.
- B. As-Planned Easement Drawing with proposed easement strip.
- C. Responsibility Agreement /OP-D32 Contract.

4.6 Service Request Dos and Don'ts

REMEMBER:

Do: Contact UI's Customer Care Center to apply for electric service and provide complete and accurate information. Please allow sufficient time for UI to review your request, order necessary materials and schedule the required work.

Label meter provisions and main switches with the same identifying mark as the unit the meter serves.

Have the authority having jurisdiction inspect and release the service (new or renovated) and notify UI of such release.

Install meter provisions outside.

Don't: Install electric service without first applying for service and obtaining the job requirements and a job number from UI.

Excavate underground facilities before contacting **Call Before You Dig at 811 or 800-922-4455**.

Install meter provisions indoors.

Install service conduits to poles until such poles have been approved by UI and the location of the conduit has been clearly marked on the pole.

Install more than one 10-foot vertical section of conduit or any service entrance conductors in conduits to poles, padmount transformers or hand holes without coordinating the installation with UI.

5. DESIGN CRITERIA & CONSTRUCTION PRACTICES

5.1 Overhead and Underground Services

A. Overhead Service Drops

1. Overhead service drops are installed, owned and maintained by the company. A clear path, devoid of vegetation, is required. Customer is responsible to maintain this clear path.
2. Overhead service drops must not exceed 150 feet in length.

3. The point of attachment on the customer's premises will be approved by the company and shall be the shortest practical distance from the company's pole. Service bolts will be supplied by the company (see Section 12 to find the locations where service bolts are available) and installed by the customer. The bolt shall be adequately anchored at the point of attachment to safely withstand the strain imposed by the service drop. The service bolt must be installed in such a manner that it can withstand at least 650 pounds of tension. The contractor should install the bolt into brick, concrete block or masonry construction when available.
4. The point of attachment shall be safely accessible by UI crews from a ladder on level ground, and the height above finished grade shall not be less than 12 feet nor more than 26 feet. The point of attachment shall also be such that the minimum conductor clearances conform to NEC 230.24. Attachment height must allow for 12 inches of separation between any communication cable and the service conductor along the length of the cable run.

NOTE: If the height of a structure is not adequate to maintain these clearances, a service mast may be necessary. Refer to Guidebook Standards #1, 2, 3 and 4 in Section 13.

5. The point of attachment shall be designated such that UI's service drop is not readily accessible as defined by the National Electrical Code and the National Electrical Safety Code and adequate horizontal and vertical clearance can be maintained. In no case shall UI provide, own or maintain a service drop that runs horizontally along the surface of a building.
6. Service entrance conductors provided by the customer shall conform to the National Electrical Code and the local authority having jurisdiction and shall be properly identified.
7. If allowed by the local authority having jurisdiction, a maximum of two service masts with a total of six-wires for single-phase or eight-wires for three-phase can be connected to a single service drop.

B. Underground Service Laterals

1. Underground service laterals (both the conduit and the service entrance conductors) are supplied, owned and maintained by the customer from the service entrance equipment to the designated point of attachment to UI facilities.

2. Trenching for underground laterals from wood poles shall not start until the service location is approved and the conduit location is marked at the pole by UI. A maximum of two risers for the electric service can be installed on the pole, and a maximum of three wires for single-phase and four wires for three-phase can be installed in each conduit. While allowed by NEC, UI does not allow multiple sets of conductors in a single conduit. The contractor installs only the first ten-foot vertical length of conduit and one stand-off bracket (a minimum of eight feet above final grade). The conduit must be installed per Guidebook Standard #24 with the conduit being installed away from the flow of traffic and three inches from the pole. The additional conduit, stand-off brackets, weatherhead and UL listed conduit grounding clamp or ground lug kit on the weatherhead are provided by the customer and installed by UI. The riser conduit and elbow at the pole must be rigid galvanized steel. To facilitate the installation of the wires, UI recommends that the elbow at the pole be larger than the minimum allowable radius for the trade diameter conduit being installed.
3. Conduit from the service entrance equipment back to the property line can be either rigid galvanized steel or PVC, subject to the requirements of the NEC and the authority having jurisdiction. Conduit in the street right-of-way (curb to property line) must be rigid galvanized steel.
4. For underground services from single-phase padmount transformers or secondary hand holes, the contractor must locate and extend the PVC conduit stub at the UI point of service connection. If no stub is available, contact UI's Engineering Department for assistance. Do not attempt to install any conduit or cable into the transformer or hand hole without contacting UI.
5. Direct buried services must extend in rigid galvanized steel conduit from the pole onto private property or extend five feet in Schedule 40 PVC conduit from the single-phase padmount transformer or hand hole. The conduit at the service entrance must extend perpendicularly away from the building foundation wall a minimum of five feet.

NOTE: UI does not recommend the installation of direct buried services.
6. Service entrance conductors from poles, padmount transformers or hand holes must be continuous to the meter location. Pull boxes or tap boxes are prohibited except when located next to and installed as part of the service entrance equipment.

7. Protection from ground movement for underground service entrance conductors shall be provided by the installation of a UL listed slip fitting at all meter provisions. The slip joint shall be the appropriate match to the trade diameter of the service conduit and be securely fastened to the building with a minimum of two clamps. Refer to Guidebook Standard #13 in Section 13. Upon pre-approval in writing from the company, specific applications may be authorized to use flexible metal conduit in place of a slip joint.
8. Our Standard Field Department will schedule the installation and connection of your underground service entrance conductors. You will be contacted after the authority having jurisdiction has inspected the service and the release is posted in our system.

5.2 Road Crossing Poles

The company will make every effort to treat all customers equally, no matter which side of the street they reside on. UI will therefore install road crossing poles as follows:

- A. The company will install overhead secondary service from a pole on the street provided the span does not exceed 150 feet. (100 feet for 400 A services). If the pole is on the opposite side of the street and the service would be within the 150 feet limitation if the pole was on the other side of the street, then a road crossing pole will be set at no cost. If additional poles beyond the road crossing pole are required to reach the building, they will be installed by the company on a billable basis and are covered under UI's Private Line Pole Policy. Refer to Section 5.3 below and to Guidebook Standard #5 in Section 13.
- B. If the customer elects to install underground service, UI will install a road crossing pole at no charge to save the customer the cost of trenching across the street. If the customer elects not to have the pole installed, no credit for said pole would be granted by UI. Refer to Guidebook Standard #6 in Section 13.
- C. The company will install one section of wire, at no charge, from a street pole on the customer's side of the street. If the street pole line is located on the opposite side of the street, the company will install a pole on the customer's side of the street, if necessary, and the previously mentioned section of wire will be installed from that pole at no charge. Refer to Guidebook Standard #7 in Section 13.

5.3 Private Line Poles (PLP)

- A. Where off-street overhead facilities for a single customer are required, all facilities beyond the standard 150-foot span of overhead wire are billable to the customer. The company will install, own and maintain the overhead facilities. The property owner must sign a Private Property Permit or permanent easement. Future changes to or relocations of these facilities requested by the customer are also billable.
- B. Where off-street overhead facilities for multiple customers are required, the company will install, own and maintain the overhead facilities. These facilities will be installed at no cost to the customers. A permanent easement must be granted to UI by the property owner(s). Future changes to or relocations of these facilities requested by the customer are billable.
- C. When company-owned poles are installed on private property, permanent truck access to all poles must be provided and maintained by the property owner.

5.4 Cut & Reconnect Policy

POLICY DESCRIPTION:

The United Illuminating Company will permit electrical contractors and electricians (herein jointly called "electricians"), licensed by the State of Connecticut, to cut and reconnect residential services at the weatherhead in order to expedite work requested by customers. Failure to follow the steps contained within the procedure of this policy may result in additional corrective work and expense for the electrician. The electrician will be billed for any corrective work performed by the company. Unauthorized connections to the company's service conductors will be treated as tampering and may result in criminal prosecution. The electrician shall be responsible for obtaining the appropriate permits from the local municipal authority. Homeowners are not authorized to cut and reconnect electric services. Homeowners can only install de-energized or dead services. To participate in the program, an electrician must hold an E-1 or E-9 license issued by the Connecticut Electrical Work Examining Board or work in the capacity of an E-2 Journeyman or electrical apprentice under the employment of an E-1 licensee. Under this condition, physical work may be performed; however, the permit must be obtained by the licensee who is responsible for the work at the location.

The electrician, its employees and those under its control shall perform all work as independent contractors and shall not be deemed to be employees or agents of United Illuminating for any purpose whatsoever. UI shall not be liable for direct, indirect or consequential damages of any kind, whether resulting from injuries to persons or property or otherwise arising out of the electrician's work.

SCOPE OF WORK:

Services to be cut and reconnected must meet the following criteria:

- Single-phase, overhead service drop, 200 A class (maximum) with voltages of 120V line to ground.
- UI requires permanent connections, which will be inspected by UI in order to reduce customer damage due to poor connections.

PROCEDURE:

The electrician shall perform the following:

1. **The electrician shall** contact the company at **800-722-5584** prior to starting work to avoid possible code violations or non-compliance with company requirements. A service location request can also be submitted online at **uinet.com**.

NOTE: In the remarks section, *This Work Involves Cut and Reconnect*, the work must be completed within 15 days from the required service date.

2. **The electrician shall** cut the drip loop at the house, on the line side, immediately adjacent to the company's existing connectors.
3. **The electrician shall** replace/repair the service entrance/meter box up to the first disconnecting device.
4. **The electrician shall** connect the replaced or repaired service entrance/meter box to the live ends of the company's service drop using properly sized connector types as outlined below:
 - Phase/hot leg: Insulation Piercing Connectors
 - Neutral: Parallel Groove Connectors
 - Connectors must be approved for use with the type (copper/aluminum) of conductors being installed.

NOTE: Split bolt and taped connectors are not acceptable for permanent connections.

5. **The electrician shall** install approved rated jumpers and optically clear meter socket cover(s) to avoid damage to the meter socket, ensure public safety and provide access for visual inspection. Covers and service bolts are available through the local building official's office or from UI. Jumpers may be obtained at UI's Operations Center located at 100 Marsh Hill Rd., Orange, CT.

6. **The electrician shall** leave the old meter in close proximity to the new meter socket. In no case shall the electric meter be reinstalled.
7. **The electrician shall** be responsible for obtaining municipal inspection/ approval and shall advise the company within one business day of completing Steps 1-6 above.
8. **The company shall** ensure that the installation meets company requirements and install the necessary meters.
9. Service requests older than six months that have not been completed may be canceled. Contractors may be required to request service again and be issued a new job number. It is the responsibility of the contractor to inform local jurisdiction of this change.

VIOLATIONS:

In any instance of deviation from the above procedure:

1. **The company will** bill the electrician for de-energizing meters without an active service request. Any time a meter is de-energized without authorization, our automated systems may dispatch company personnel to the outage.
2. **The company will** send written notification to the electrician and the municipal authority, describing the specific violation of this policy. This notification will serve as a warning.
3. **The company will** bill the electrician for costs incurred by the company due to the violation.
4. **The company will** notify the appropriate municipal and state authorities after multiple warning letters have been issued. This constitutes a violation letter.
5. **The company will** suspend the electrician's privilege to participate in the Residential Overhead Service Policy, which includes the Cut and Reconnect Policy.
6. The Trade Practice Division of the Department of Consumer Protection of the State of Connecticut will review complaints to determine if Connecticut General Statute Section 20-334 has been violated and take appropriate action, up to and including penalties, as described in the Connecticut General Statute Section 20-341.

5.5

Buildings Vacant for Periods Greater Than Six Months

Reference: State of CT House Bill 6292 (Session 2003)

If the owner of a building or portion of a building that has been unoccupied and disconnected from the electric distribution system for a period of six months or longer wishes to resume the delivery of electricity, the owner shall contact United Illuminating to request a service reconnection form to be signed and notarized by the building owner's contracted electrician, stating that an inspection of all customer-owned facilities on private property used to supply electric power to such building is electrically safe and does not constitute a public safety hazard. Services disconnected due to fire, flood or similar circumstances will not be reconnected without the proper notification and/or permit by an appropriate public official. Please contact UI for any additional guidance in determining the inspection requirements.

5.6

Demolition

- A. To terminate UI service to any building or structure designated for demolition, a notarized letter from the property owner must be received by UI. For condemnations, eminent domain proceedings, etc., a letter from the municipality is acceptable. Please send the letter to:
United Illuminating
Standard Field Department
100 Marsh Hill Road (MS OP-GB)
Orange, CT 06477-3628
- B. The letter must list the legal address of the property as determined by the tax records, and the front of the building must be clearly marked with this number in orange paint.
- C. UI personnel must have access to the premises for verification of the service disconnect and for removal of UI equipment. If the building structure is unsafe for entry or UI cannot gain access to the premises, then the building owner is responsible for verifying that the service to the building has been disconnected before proceeding with the demolition.
- D. When completed, UI will prepare a letter stating that all of its facilities have been removed from said property. The letter will be sent to the originator of the request and to the appropriate municipal authority. Contact UI's Standard Field Department.

5.7 Service to PCS Towers

- A. Where personal communication system (PCS) towers, antennas or other similar systems are installed on leased property, a PCS Agreement must be signed by both the tower owner and the land owner. Before planning any service, please contact UI's Engineering Department.
- B. For stand-alone towers, new electric service will be administered according to the applicable UI policies and procedures. The initial service installed must have sufficient electrical capacity (including meter provisions) to supply the maximum number of carriers for which the tower is designed.
- C. Where the construction of the proposed service will not comply with UI standards and/or access to the electric facilities is restricted, UI may require a primary voltage service with a single primary meter. All facilities beyond the primary meter are to be installed, owned and maintained by the customer.
- D. For service additions to stand-alone towers, UI prefers one service entrance with one meter location. Where it is impractical to combine the new service with the existing service, UI will allow a second meter location provided both services originate from the same UI source, a placard of the service locations is posted at each entry gate, and it is approved by the authority having jurisdiction.
- E. For towers or antennas attached to existing buildings or other structures, the preferred method of service is to utilize the existing service. This may involve a service increase and/or a reconfiguration of the existing metering. A separate service to the building (including line side taps in the service entrance equipment) is not permitted unless granted in writing by UI and approved by the authority having jurisdiction. Refer to UI Guidebook Section 2, Paragraph D.

When submitting application for service, the following is required:

1. A copy of the Lease Property Agreement between the land owner and the tower owner
2. An A2 survey plot showing the property lines
3. A completed UI Load Information Form
4. Documentation stating the maximum number of carriers that the tower can accommodate, stamped by a professional engineer licensed in the State of Connecticut.

6. MOTORS

6.1 General Requirements

If a motor is connected to a secondary system that also supplies other UI customers, the following conditions must be met in order to minimize voltage flicker and other disturbances caused by the starting currents. The starting current of a motor is assumed to be the locked rotor current stated on the nameplate or obtained from the manufacturer's coding or test data.

- A. When two or more motors start simultaneously, the sum of all their horsepower ratings shall be totaled. The maximum allowable total starting current shall not exceed the value listed in Section 6.3 or 6.4, as applicable, for the total of the horsepower rating of all motors that are started simultaneously.
- B. If the locked rotor current of any motor exceeds the allowable starting current listed in Section 6.3 or 6.4, then the motor shall not be started across the line. The customer must furnish, install, own and maintain a reduced voltage starter or other device to bring the starting current within the allowable value.
- C. Motors should be rated for use at the service voltage provided by UI, and you should verify your service voltage prior to buying any equipment. The nominal service voltages available are 120, 208 and 240 volts single-phase and 208, 240 and 480 volts three-phase. Motors rated at 220, 230, 440 or 460 volts may not operate satisfactorily.

6.2 Protective Devices

- A. UI strongly recommends that all motors be controlled and protected from damage that can occur by operation under abnormal conditions. These conditions include single phasing, under voltage, phase reversals, voltage transients and other operating hazards. The company is not responsible for equipment and/or collateral damage due to abnormal conditions. Customers are advised to install adequate protection on all motors. Protective equipment must conform to the requirements of the National Electrical Code.
- B. There are advantages to incorporating timed under-voltage relays for motors on certain applications. Due to the normal, rapid reclosure of our supply circuit breakers, many manual restarts can be avoided by delaying motor contactor opening.

6.3 Single-Phase Motors

- A. Single-phase motors not exceeding 50 A of starting current (typically up to 1 horsepower, 12,000 BTUs or 1 ton) may be connected for 120 volt operation.
- B. Single-phase motors not exceeding 150 A of starting current (typically up to 5 horsepower, 60,000 BTUs or 5 tons) should be connected for 240 volt operation.

6.4 Three-Phase Motors

- A. Three-phase Design Code B, C and D motors, up to 50 horsepower inclusive, may be started across the line if they do not have locked rotor currents per phase conductor in excess of the following:

Maximum Allowable Motor Starting Current for Across the Line Starting

HP	208V	240V	480V
Up to 10	179	155	78
11 -20	321	278	139
21 -30	481	417	208
31 -40	641	556	278
41 -50	802	695	347

- B. For motors larger than 50 HP or for motors served at primary voltage (above 480 volts), contact UI's Engineering Department for motor starting requirements.

7. EMERGENCY INTERRUPTION OF SERVICE & EMERGENCY GENERATORS

7.1 Interruption of Service

The company makes every effort to maintain its system to the highest possible standards but cannot assume liability as a result of any failure of its service or equipment. The company reserves the right to interrupt service to a customer without notice when repairs or changes make such a procedure necessary and also to restore service without notice when such work is completed. Any equipment that might endanger life or damage property under conditions of low voltage, single-phase operation or normal switching should be provided with suitable automatic protection by the customer. Please contact UI's Engineering Department for guidance.

7.2 Emergency Generators

An independent source of electricity (such as gasoline, or diesel-driven generators) may be installed by a customer to supply its load during emergencies. Such installations require a suitable double throw or open transition switch. The double throw switch must disconnect the company's lines from the customer's wiring before the generator can be connected to supply electricity.

Customers considering use of a closed transition switch in conjunction with an emergency/standby generator must follow the interconnection process as described in Section 8.1.

8. ALTERNATE ENERGY SOURCE

8.1 Parallel Generation

Subject to certain requirements, the company will allow parallel generation. The company adheres to interconnection standards (and applicable documents) that were approved by the State of Connecticut Public Utilities Regulatory Authority (PURA) through proceedings held by PURA and PURA's decisions issued as a result of those proceedings. Please visit our website at uinet.com and then click on the *Generators* link. The website provides an overview of the interconnection process, copies of the interconnection guidelines, technical requirements and application documentation. The application should be filed early in the planning process to obtain assistance and the necessary approvals.

8.2 Uninterruptible Power Supply (UPS)

If this type of service is desired, it will be installed, owned, operated and maintained by the customer. The customer must provide automatic prevention of any feed into UI's de-energized system. Please contact UI's Engineering Department for guidance.

9. QUALITY OF SERVICE

9.1 Voltage Regulation

UI is required to maintain its voltage variations to within the requirements of the Regulations of Connecticut State Agencies, Title 16: Public Utilities Regulatory Authority (PURA) Code of Electrical Standards and Specifications, Section 16-11-115, UI will be glad to answer questions regarding voltage or power quality concerns. Please contact UI's Engineering Department.

UI is constantly seeking new ways to improve the quality of power and reliability of service provided to its customers. Unfortunately, there are many variables that could possibly contribute to poor power quality that are beyond the company's control, including, but not limited to: equipment failure, tree contact, animal contact, severe weather, auto accidents, emergency switching, etc. Each of these events can produce voltage transients that may cause misoperation of, or possibly damage to, electronic and other equipment.

Some of these events will result in momentary periods of low voltage or loss of voltage. In general, these events will not damage electronic equipment but result in their mis-operation. Extended periods of low voltage may also cause damage to motor-operated equipment. Refer to Guidebook Section 6 – Motors.

Other events will produce brief periods of high voltage, which may damage electronic or other equipment. To protect against high voltages, the equipment manufacturer's recommendations regarding surge protection should be followed. In addition, installation of a surge-protective device at the service entrance will provide an added level of protection.

Customers supplied with three-phase service should consider additional protection from certain disturbances on the UI system. Partial loss of power can result in single-phasing which may cause damage to your equipment. The company is not responsible for equipment and/or collateral damage due to these abnormal conditions. Customers are advised to install adequate protection.

9.2 Non-Linear Loads

Adjustable speed drives, solid-state lighting ballasts and electronic power supplies are all examples of non-linear loads. The term *non-linear* comes from the fact that the current drawn by this type of load is not sinusoidal and is referred to as containing *harmonic currents*. These harmonic currents can result in distorted voltage, added losses, and heating in equipment supplying the load, as well as interference on communication circuits.

Problems caused by these non-linear loads are to be corrected by the customer at their expense. If these loads cause problems to UI's system or to other customers' equipment, correction is a mandatory condition of service. Customers with non-linear loads of more than 25 percent of their total load must contact UI's Engineering Department for assistance in applying the loads.

10. METERING

10.1 General Requirements

- A. The company will furnish, install, own and maintain all meters required for billing purposes at the delivery voltage on the customer's side of the service point in accordance with the company's applicable tariff and applicable state laws and regulations. This includes meter instrument transformers and meter cable when required.
- B. The company will not supply service to a customer whose wiring is designed for resale of electricity through submetering except for recreational campgrounds, marinas or other facilities as approved, in writing, by the Public Utilities Regulatory Authority (PURA).
- C. The customer is required by regulations of the State of Connecticut to provide the company reasonable access to its equipment, and access shall include three feet of clear space in front of the meter and be neither obstructed nor hazardous as defined by the National Electrical Code.
- D. All unauthorized persons are forbidden to connect, disconnect, relocate, tamper with or break seals on service entrance equipment, metering equipment or pull boxes and troughs housing unmetered conductors. This requirement is not intended to prevent the customer from operating the main switch or replacing blown fuses.

- E. When it is necessary to cut or remove a meter seal and/or de-energize an existing meter for any reason, the company must be notified immediately. Please call UI's Customer Care Center at **800-722-5584**. Any time a meter is de-energized without authorization, our automated systems may dispatch company personnel to the outage. The company will bill the electrician for unauthorized nonemergency meter removals. All other equipment such as a water heater adaptor, a surge-protective device or a GenerLink must be handled with care and the company notified so this equipment can be reinstalled.
- F. All costs associated with damaged metering equipment or personal liability claims as a result of work performed by non-UI employees will be charged to the responsible party.

10.2 Metering Installation Requirements

A. Outdoor Metering Requirement

On all new construction and renovations of existing services, all meter(s) at the premises shall be located outdoors and mounted on the structure. The company will, in certain circumstances, give permission in writing to install the meter(s) indoors. The following circumstances are pertinent to UI's decision to allow permission for indoor metering:

1. The addition of one house meter to an existing service is not considered a renovation. The new house meter should be located with the existing meters.
2. Lack of exterior wall space or the inability to terminate service cables or conduits in a feasible exterior location for the metering provisions as determined by company field technicians will be considered.
3. Personal financial hardship will not be considered sufficient reason for retaining indoor metering equipment to avoid normal installation costs associated with installing the metering outdoors.

If indoor metering is desired, the customer must send a written request detailing their specific reasons to the company's Standard Field Department as far in advance of construction as possible to avoid last-minute delays. The company will then send the customer a letter approving or denying their request. Standard Field Department Supervision is the only company representative authorized to grant such approval.

For all indoor meter locations (granted by UI prior to the start of any construction) the owner will be required to provide a one-inch minimum diameter Schedule 40 PVC conduit from the meter location to the outside of the structure and a dedicated circuit from the owner's (house) panel to facilitate the installation of antennas for automated meter reading equipment.

- B. All meter locations must be installed according to company requirements:
1. Where the location of an outdoor meter would be a hazard to the public or to the equipment, the company will determine a more suitable location or require the customer to provide additional protection for the meter(s).
 2. Meters and low voltage service equipment shall not be installed in transformer vaults, high voltage switchgear rooms or other such restricted access areas.
 3. Meters will not be installed where they will be subject to corrosive fumes, excessive moisture, dust, vibration or possible damage.
 4. In large office buildings and apartment buildings, where separate meters are required for the various offices, apartments, suites or lofts, metering equipment may be installed indoors, in groups, at locations approved in writing by UI. All such locations (designated meter rooms or closets) will be required to provide an additional one-inch minimum diameter Schedule 40 PVC conduit from the meter location to the outside of the structure and/or a dedicated circuit from the owner's (house) panel to facilitate the installation of antennas for automated meter reading equipment.
 5. Meters for emergency systems, such as fire pumps, are to be located adjacent to other meters serving the building unless an alternate location is approved by UI's Standard Field Department.
 6. Meters may be allowed to be mounted on pedestal-style socket equipment only in mobile home developments or other service locations such as outdoor signs, communications towers, etc. These installations are limited to single-phase, 120/240 volt, 200 A or less. Other types of freestanding metering provisions must be approved in writing by UI and include suitable physical protection from damage.
 7. In some shoreline areas designated as a tidal flood plain, the customer may be required by the local town electrical inspector to install the meter provision higher than the maximum 72 inches allowed by the company. In such cases, the customer will be required to construct a suitable stepped platform or other means to facilitate access for company employees to perform meter work. If such a platform cannot be built, the customer may be charged for future expenses incurred by the company to perform its work that is above and beyond normal expenses. In some cases, this may include costs

associated with the use of a bucket truck and extra personnel to perform the work safely and efficiently. For more detail and exemptions, refer to Guidebook Standard #28, Section 13. Failure to comply will result in the company de-energizing the service, and the customer and/or contractor will be responsible for bringing the service to UI standards.

- C. For two-family or multi-dwelling units, all common facilities (lighting, alarm systems, well pumps, communication, etc., or other needs for public areas) must be metered separately per NEC, Section 210-25(B). This separate meter is known as the *house meter*.
- D. The customer is required to install individual meter sockets a minimum of 4 feet and a maximum of 5 feet from the finished grade to the center of the socket. A customer with a multiple meter installation is required to install meter sockets a minimum of 2½ feet and a maximum of 6 feet from the finished grade to the center of each socket.
- E. Meter sockets may not be located in driveways or other locations that will pose a hazard to pedestrian or vehicle traffic.
- F. Under no condition will the company approve the installation of metered and unmetered conductors in the same conduit or raceway. In combination meter-main service equipment, the line and load wiring must be isolated to their respective compartments.
- G. To ensure safety, all meter sockets that are without a meter and energized will be protected with a see-thru polycarbonate cover. These covers are available from UI and are to be installed by the electrical contractor. If the meter socket is intended to be a spare or otherwise left without a meter for a period exceeding six months, then a gasket or silicone sealant should be applied between the polycarbonate cover and the meter socket cover to prevent the entry of water.
- H. Electric meter provisions shall not be installed above or below gas meters and require a minimum of 3 feet of horizontal separation.
- I. Electric meter provisions require a minimum of 10 feet of horizontal separation from propane relief valves, vents or filling covers (NFPA 58).
- J. Meter sockets cannot be used as a grounding point. The grounding electrode conductor shall not be run through the meter socket, and the grounding electrode conductor connection shall not be made within the meter provision.

- K. For all three-phase, four-wire delta or wye services where the secondary service is grounded at any point, the grounded conductor shall be run to each main switch or service disconnect (in accordance with the National Electrical Code). In addition, the grounded conductor shall be run to each meter provision (i.e., meter socket or current transformer cabinet).
- L. Meter socket enclosures are not to be used as a raceway or splice box. Any connections made between the load side of the meter and the main breaker (for parallel generation, for example) must be made outside of the meter enclosure.
- M. For customer parallel generation, UI normally installs one watt-hour meter capable of measuring bidirectional power flow in the existing meter socket enclosure. UI may choose to meter generator output, customer loads or other quantities it deems necessary. The customer may be required to install metering facilities, such as meter sockets, to facilitate this metering. This additional metering is subject to the same requirements as that of revenue metering.
- N. Auxiliary Equipment, Emergency Circuits and Emergency Generators
 1. No ammeter, voltmeter, pilot light, surge-protective device or other device shall be connected to the secondary of the metering transformers or to the service conductors between the point of entrance and the point at which the metering equipment is connected to the circuit unless an integral part of an approved UL listed switchboard design. No field add-on will be allowed.
 2. Where state or local ordinance requires the installation of a circuit for emergency systems, such as fire pumps, fire alarms or exit lighting, on the line side of the normal metering, an additional metering provision shall be required.
 3. Services to electric motor-driven fire pumps must be metered using a switch-fuse-meter sequence and utilize transformer-rated metering to ensure that the meter is not called upon to carry overloads required by NFPA and does not serve as a disconnecting means and interrupt power to the fire pump if it is removed for any reason.
 4. Metering must always be installed on the line side of control circuitry in such a manner that the meter is always energized when the service is energized.
 5. If a double throw switch is installed by the customer to supply its load from an emergency generator, it must use an open transition throwover scheme. The switch must be installed on the load side of the meter and must be connected so that the electricity from the customer's generator will not flow back into the company's lines. See Section 7.2 – Emergency Generators.

O. Equipment Marking Requirements

1. Where more than one set of metering equipment is supplied through one service entrance, each set of metering equipment and each corresponding apartment, distribution panel or load center must be marked, using a nameplate or other permanent marking, with the corresponding number or letter designations of each unit (such as Apt. C or Suite #103).
2. Each service disconnect shall be permanently marked in large conspicuous block letters as either *main switch* or *service disconnect*, per NEC requirements.
3. Where more than one kind of service is supplied, each service disconnect should be identified in the same manner, per NEC requirements. The nameplate or sign should also state the voltage and phase characteristics of the service and the number and location of the other services.
4. On three-phase, four-wire delta services (120/240/240 volts), the phase having the higher voltage to ground shall be permanently marked with an orange color in switchboards, panelboards and CT cabinets. On services utilizing modular gang socket metering (up to and including 200 A provisions) and feeding both three-phase and single-phase meter sockets, the equipment must be capable of field modification through phase balancing taps to configure the high leg on the upper right jaw of the three-phase sockets while maintaining proper 120/240 volt configuration to the single-phase sockets.
4. EXCEPTION: On services exclusively utilizing transformer rated metering, this phase is required on the right; however, if the switchgear is manufactured with this phase in the center, it will be allowed to remain in the center.

P. Sequence of Service Entrance Equipment – Rated 480 Volts and Below
Meter sockets have a short circuit withstand rating of 10,000 A RMS symmetrical at 300 VAC. Any meter installed on a service with an available fault current greater than 10,000 A must be installed in cold sequence and protected by a device that limits the fault current to 10,000 A or less. Consult the Engineering Department to determine available fault current.

1. The meter-switch-fuse (hot) sequence shall be used for all single-meter self-contained socket-type installations on services rated 320 continuous amperes and below and voltages of 120/240 single-phase, 120/208 single- or three-phase. See Exception below in Paragraph Q2.
2. EXCEPTION: For services where the available short circuit current exceeds the rating of the meter socket, the switch-fuse-meter (cold) sequence shall be installed. Typically, this requirement pertains to services from vaults where the short circuit protection requirements are 200,000 A. Refer to Guidebook Section 3.4.

3. The meter-switch-fuse (hot) sequence is preferred for all installations of pre-bussed multiple meter banks where six sockets or fewer are installed and Exception 10.2.P.2 does not apply.

NOTE: The customer may install a fusible main switch or circuit breaker in lieu of a main lug section and switch-fuse-meter (cold) sequence is then acceptable.

4. The switch-fuse-meter (cold) sequence shall be used for all installations of multiple meter banks where troughs or wireways are used or where seven or more pre-bussed sockets are installed (i.e., a main switch is required).
5. The switch-fuse-meter (cold) sequence and transformer-rated metering shall be used for all installations rated above 400 A, as well as optionally for all 400 A services.
6. The switch-fuse-meter (cold) sequence shall be used for all 277/480 volt, installations.
7. The switch-fuse-meter (cold) sequence and transformer rated metering shall be used for all services to electric motor-driven fire pumps. Refer to 10.2.N.3.

Q. Installation of Sockets

1. Meter sockets must be mounted plumb using round-head, rust-resisting screws of sufficient length to hold the socket securely, independent of conduit or cable connections.
2. Suitable anchors must be used on masonry or brick walls for outdoor installations.
3. A meter board is required for all indoor installations. This board should be made of moistureproof plywood at least $\frac{3}{4}$ " thick and painted. It should be mounted plumb and level on a permanent wall with at least $\frac{3}{4}$ " air space between the board and the wall.
4. In multiple socket installations, the company requires a vertical or horizontal, pre-bussed arrangement. Wire troughs are no longer allowed for single or multiple meter installations. For the addition of one or more meters to an existing trough, contact UI for written approval before proceeding.
5. For underground services utilizing self-contained metering, the line-side conductors shall enter the bottom and shall be routed up through the left-side gutter to the line-side lugs. For overhead services, the line-side conductors shall be top entry.

R. Class 320 Metering Installations

Customers applying for a 400 A service at a delivery voltage of 120/240, 120/208 or 277/480 volts who propose to install a self-contained 320 A meter socket shall meet the following criteria:

1. Class 320 meter provisions may only be installed where the load-side capacity is not more than 320 A continuous (NEC Article 220).
2. Class 320 meters used in multimeter banks must be cold sequence.
3. The customer shall reserve space for a future instrument transformer cabinet, since any failure of the company's self-contained meter due to loads greater than 320 continuous amperes will require an upgrade to instrument transformer metering prior to re-energization.
4. NOTE: Class 400 bolt-in metering is not approved by UI. Installations that do not meet the continuous current requirements for Class 320 metering must use instrument transformer metering.

S. Requirements for Transformer-Rated Metering

1. All services above 400 A and all services to fire pumps, regardless of size, require transformer-rated metering.
2. The company will provide and install all metering transformers, meters, test switches and wiring to the test switches.
3. Where a ground fault Interrupter is installed on a customer's service, the customer shall supply and install a grounding electrode to the current transformer enclosure. The current transformer secondary will be grounded to the grounding electrode conductor and not to the system neutral. The intent of this requirement is to avoid incorrect tripping of the GFCI.
4. The customer shall provide a 1½" conduit, either metallic or nonmetallic, without junction boxes for the wiring between the metering transformers and the meter socket enclosure. The remote meter socket enclosure shall be effectively bonded either through the metallic conduit or by a #10 AWG copper wire installed in the conduit. The electrical contractor shall install a pull line. Conduit fittings with removable covers (LBs, CS, etc.) shall only be used at the CT compartment and at the meter provision, with no more than two of these fittings per installation. The maximum height for fittings with removable covers is eight feet. Any exceptions to this requirement must be approved in writing by UI's Standard Field Department.

5. For services of 800 A or below, the maximum circuit length from the metering transformers to the meter socket must not exceed 75 feet. For services of more than 800 A, the maximum circuit length from the metering transformers to the meter socket must not exceed 150 feet. Any exceptions to this requirement must be approved in writing by UI's Standard Field Department.
6. In general, meter sockets should be mounted on an outside wall as close to the metering transformer location as possible.
7. A current transformer cabinet or combination switch shall not be used as a wiring trough. Full-width barriers on the top and bottom of the metering section shall isolate the current transformer compartment of a combination switch. If additional gutter space is required, the current transformer compartment shall be provided with side and/or rear barriers.

Where a current transformer compartment is enclosed within a larger enclosure, the current transformer wiring must exit the current transformer compartment in conduit that is securely attached to the compartment.

T. Optional Metering Services

Optional offerings such as meter load output pulses and web-based energy profile information are available to all customers. There is a charge for such services. Please contact UI for a schedule of charges and more information.

10.3 Metering Equipment

Table of available metering equipment:

Service Type	Service Voltage	# Phases	# Wires	Service Amperes	# Meter Terminals	Hot/Cold Sequence
Self-Contained Metering (320 A continuous and below)						
Residential/ Commercial	120/240	1	3	100/200/ 400	4	Hot *
Residential/ Commercial	120/208	1	3	100 / 200	5	Hot
Commercial Network	120/208	1	3	100 / 200	5	Cold
Commercial	277/480	1	3	100 / 400	5	Cold
Commercial	120/208	3	4	200 / 400	7	Hot *
Commercial Network	120/208	3	4	200 / 400	7	Cold
Commercial	277/480	3	4	200 / 400	7	Cold
Transformer-Rated Metering						
Residential	120/240	1	3	Above 400	6	Cold
Commercial	120/208	1	3	Above 400	8	Cold
Commercial Network	277/480	3	4	Above 400	13	Cold
Commercial	120/208 277/480	3	4	Above 400	13	Cold
Fire Pump	120/208 277/480	3	4	Any	13	Cold

HOT SEQUENCE: METER-SWITCH-FUSE

COLD SEQUENCE: SWITCH-FUSE-METER

* CLASS 320 METERS USED IN MULTI-METER BANKS MUST BE COLD SEQUENCE

1. Beginning with the 2016 edition of this Guidebook, UI will no longer provide an itemized list of approved metering equipment, but will instead provide a listing of attributes and criteria for metering equipment.
2. This equipment is also subject to the approval of the authority having jurisdiction (normally, the Municipal Electrical Inspector).

3. All metering equipment is to be furnished and installed by the contractor unless otherwise specified by the company.
4. Approved mounting details and dimensions are shown on company standard drawings.
5. Unusual conditions which are not covered must be referred to the company for approval.
6. Custom-built meter centers, modular meter panels and switchgear with instrument transformer enclosures must be approved by UI prior to fabrication.
7. On occasion, it may be necessary to disallow certain metering equipment due to safety or other concerns. Any such equipment will be noted in the online version of this document until the condition causing it to be disallowed is rectified.

A. General Requirements

1. All meter sockets shall have an independent test laboratory listing agency label certifying compliance to ANSI/UL 414, ANSI C12.7, NEMA 250, NEMA Publication No. EL-17 and NFPA 70 (NEC).
2. All meter sockets shall be ringless, and individual covers must have a hasp provision for the company's seal.
3. UI reserves the right to modify sockets or enclosures to add protective, locking or other devices.
4. All meter socket enclosures shall be outdoor NEMA 3R rated and withstand the ambient and environmental conditions where located. Meter facilities shall be protected from dust, moisture, corrosion, etc. Some extreme conditions may require a minimum NEMA 4X rated enclosure.
5. Meter sockets may not be locked within a larger enclosure.

B. Self-Contained Meter Socket Criteria

1. All self-contained meter sockets shall have a manual lever operated bypass. Horn type, sliding type and automatic bypasses are not permitted.
2. All 200 A and 320 A sockets shall have a bypass with locking jaws; 100 A meter sockets may have a non-locking jaw bypass.
3. When in the bypass position, the operating lever shall prevent the cover from being replaced.
4. A safety flash shield is required on all meter positions that have a lever operated bypass.

5. All wiring within the meter socket shall be placed as to not interfere with the operation of the bypass lever.
6. Jaw assembly shall permit use of *mylar plastic disconnect sleeves* being applied over the blades of the watt-hour meter without cutting or mutilating the insulator material.
7. Ringless sockets with the fifth terminal at the 9 o'clock position are required for all single-phase, three-wire, 120/208 volt services up to and including 200 A.
8. Ringless sockets with the fifth terminal at the 6 o'clock position are required for all three-phase, three-wire services up to and including 200 A. Factory-provided grounding jumpers must be removed by the customer. (For replacement of existing meter sockets only.)
9. For residential rate RT (and former rate A) customers who have an existing six-jaw meter socket used in conjunction with water heater control, and who are renovating or upgrading their electric service, lever bypass sockets must be installed without fifth and sixth jaws. The Company will then need to be notified so that it can install tank-mounted water heater control equipment.
10. Overhead type meter sockets shall have a hub opening at the top center of individual sockets, or at the top of the central wiring space of ganged meter sockets.
11. Meter socket jaw assemblies rated less than 200 A shall be compatible with Class 200 rated watt-hour meters.
12. The neutral position shall be bonded to the meter socket enclosure – with the following exception: If neutral isolation is required by NEC or the local authority having jurisdiction, only an accessory neutral isolation kit from the manufacturer of the meter socket shall be used. The neutral wire may not pass straight through the meter socket, nor will in-line splices be accepted.
13. Bolted or lay-in type terminals and terminal blocks shall have Allen or hex head terminal screws rated for 150 inch-pound (17 Newton-meters) tightening torque minimum.
14. Underground (bottom entry) meter socket types and central wiring space of ganged types shall have $\frac{3}{8}$ inch (10 mm) diameter stud terminals capable of pulling tensions up to 400 lbs. (1.78 kN) force.
 - a. The electrician shall install crimp-type or approved spring-type compression connectors. Mechanical (bolted) connectors are not acceptable.
 - b. Parallel conductors (two maximum) attached to stud terminals shall be terminated with stackable crimp-type compression connectors (or spacers approved for the purpose).
 - c. Completed connection requires two threads of the stud exposed.

15. The meter socket meets the wire bending radius within the enclosure and at terminations according to the NEC.
- C. Instrument Transformer Enclosures and Transformer-Rated Meter Sockets.
1. Ringless sockets with provision for mounting a test switch must be used for all transformer-rated metering applications.
 2. The minimum size for current transformer (CT) enclosures is 36" wide x 36" high x 10" deep.
 3. CT cabinets must be NEMA 3R rainproof for indoor/outdoor use.
 4. CT cabinet must have rolled lip covers and permanently installed hinge pins, and the cover must be removable in the open position.
 5. CT cabinets must be listed by independent recognized testing laboratory.
 6. The CT cabinet must have provisions for locking and sealing. In addition, the main switch must have provision for padlocking in the open position.
 7. Neutral isolation – If neutral isolation is required by NEC or the local authority having jurisdiction, only an accessory neutral isolation kit from the manufacturer of the CT cabinet shall be used. The neutral wire may not pass straight through the CT cabinet, nor will in-line splices be accepted.
 8. For services up to and including 1,200 A, the CT enclosures must be equipped with mounting plates for bar-type current transformers with 11⁷/₈ inch long primary bars. For services greater than 1,200 A, the CT enclosures must have removable bolt-in bus bars with supplemental support brackets of non-conductive material to adequately support window-type (donut) CTs.
 9. Window-type CTs without a bolt-in bar (i.e., around conductors or transformer bushings) may be used to renovate existing facilities, provided no CT cabinet was present before, no space is available for a new CT cabinet, the customer is not served from a network vault and it will not be necessary to de-energize other customers' service to install or remove them. Requests to use window-type CTs in this manner must be submitted by the customer, in writing, to UI's Engineering Department. If permission is granted, the reply will be in writing. This type of installation is not approved for new construction.

D. Group Metering

1. In multiple socket installations, the company requires a vertical or horizontal, pre-bussed arrangement. Wire troughs are no longer allowed.
2. Dwelling unit and suite meter sockets shall have individual covers for each socket with provisions for barrel locks and company seals.
3. Barriers are required between meter positions.
4. Individual meter covers must allow access to any customer circuit breakers.

11. ENERGY DIVERSION / THEFT OF SERVICE

Under no circumstances will electricity be supplied without being metered or otherwise accounted for under special written contracts made with UI. Any installation where the use of electricity is not billed constitutes energy diversion and is subject to financial restitution and criminal penalties. If the electrical contractor discovers a potential theft of service prior to starting work. He/she will stop the job and report the potential theft of service by calling UI's revenue protection department at 800-891-2922.

11.1 General Requirements

- A. The company reserves the right to enter the customer's property and inspect and test UI's equipment at any time without notice. If access into a building is required, UI will make every attempt to do this during normal working hours, or UI will make specific arrangements with the property owner.
- B. The company reserves the right to enter the customer's property and inspect and test customer-owned equipment that houses unmetered electricity at any time without notice. The company reserves the right to install locking devices on this equipment.

11.2 Refusal or Discontinuance of Service

- A. The company may discontinue service without notice in the event unmetered electricity is found to be used or if a known dangerous condition exists in the customer's wiring or appliances.

- B. The company reserves the right to discontinue service to any location where additional metering is required and/or proper permits have not been filed with the authority having jurisdiction (usually the Municipal Electrical Inspector).
- C. The company may terminate service for the following:
 - 1. Fraud or material misrepresentation in obtaining utility service. This includes but is not limited to:
 - a. The use of personal identification or personal identifying information of another to include a minor child or one's own minor child.
 - b. The alteration, elimination or exclusion of information on documents for purposes of deception or misrepresentation.
 - 2. Violation of or non-compliance with the rules of the company which have been filed with and approved by PURA.
 - a. This includes equipment that is not company approved.
 - 3. Failure of the customer to provide the company reasonable and unobstructed access to its equipment.
 - a. Failure to provide reasonable access may include two or more failed appointments.
 - b. All metering must have at least three feet of open space surrounding the equipment for purposes of safety.
 - 4. In the event unauthorized service, either metered or unmetered, is found to be used.
 - a. The company will hold the individuals liable for all unauthorized service upon determining the point in time at which the individual began receiving such service.
 - 5. Customer refuses to correct an unsafe condition when such condition is a result of faulty or poorly maintained customer equipment or is in violation of applicable codes.
 - a. All corrected conditions must meet NEC and NESC standards and be inspected by the appropriate local official (usually the Municipal Electrical Inspector).
 - 6. Customer fails to install/move the meter provision (on a service upgrade) outside and fails to obtain prior approval for an inside meter provision.
- D. A fee may be charged to defray the costs in such matters as per policy approved by PURA.

11.3 Jumpered Metering

UI allows electrical contractors to install jumpers in meter sockets as a means to facilitate work and to minimize disruption of service to its customers. Electrical contractors are obligated to obtain permits and electrical inspectors' releases in a timely manner to minimize the time that the meter socket is jumpered. Failure to do so is a violation of UI requirements and may result in the suspension of your qualification to perform electrical service work in UI's franchise area. In addition, the jumpers may be removed and/or the service disconnected by UI in accordance with Section 11.2. The company will install a meter on all load-carrying meter provisions within 30 days.

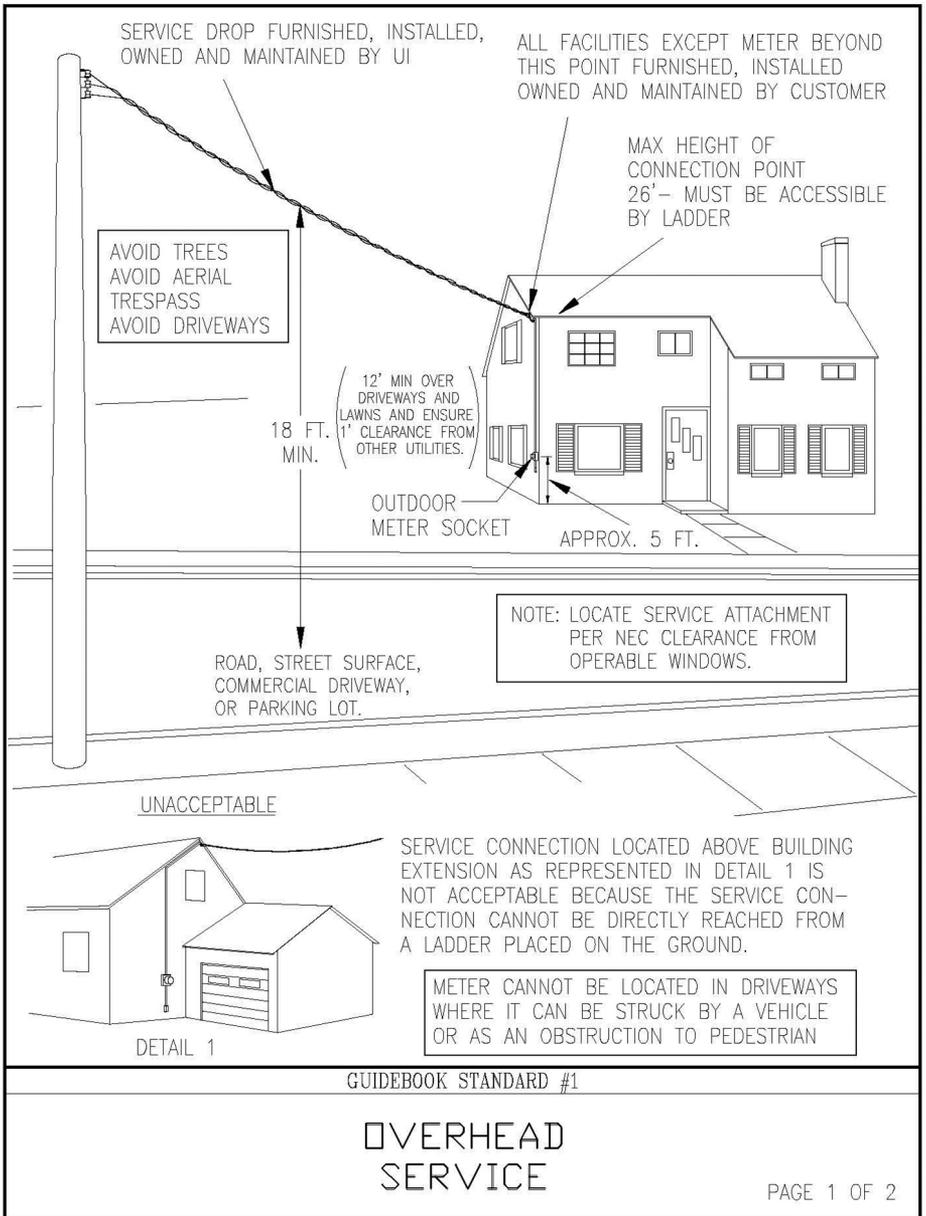
12. SERVICE MATERIALS AVAILABLE AT TOWN HALLS

Town	Service Bolts	Meter Covers	Jumpers
Ansonia	No	No	No
Bridgeport	No	No	No
Derby	No	No	No
East Haven	No	No	No
Easton	No	Yes	No
Fairfield	Yes	Yes	Yes
Hamden	No	No	No
Milford	Yes	Yes	No
New Haven	Yes	Yes	No
North Branford	No	No	No
North Haven	No	No	No
Orange	No	No	No
Shelton	Yes	Yes	Yes
Stratford	No	No	No
Trumbull	Yes	Yes	No
West Haven	No	No	No
Woodbridge	Yes	Yes	No

13. GUIDEBOOK STANDARDS

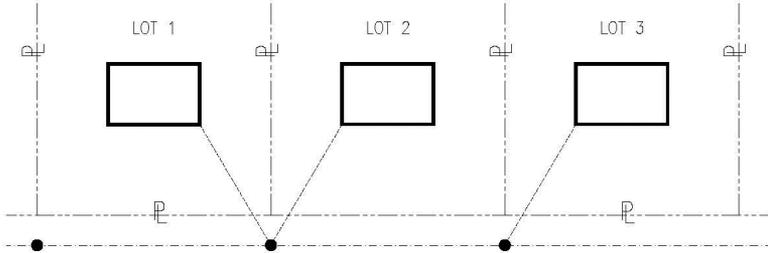
Guidebook Standard #1	Overhead Service
Guidebook Standard #2	Overhead Service Entrance Facilities
Guidebook Standard #3	Service Attachment for Masonry Building
Guidebook Standard #4	Service Mast
Guidebook Standard #5	Road Crossing Pole Overhead Service
Guidebook Standard #6	Road Crossing Pole Underground Service
Guidebook Standard #7	Road Crossing Pole – Greater Than Standard Span
Guidebook Standard #8	Guideline for Network Services – 800 A or Less 120/208 Volts
Guidebook Standard #9	Guideline for Network Services – Greater Than 800 A 120/208 Volt or 277/480 Volt
Guidebook Standard #10	Temporary Overhead Service Post Installation
Guidebook Standard #11	Temporary Underground Service
Guidebook Standard #12	Typical Outdoor Meter Installation Overhead Single-Phase Service Meter – Switch – Fuse Sequence
Guidebook Standard #13	Typical Outdoor Meter Installation Underground Single-Phase Service Meter – Switch – Fuse Sequence Service Cable in Conduit
Guidebook Standard #14	Typical Indoor Meter Installations Single-Phase three-Wire Self Contained Switch – Fuse – Meter Sequence Individual Service Ratings 200 A. Max.
Guidebook Standard #15	Typical Indoor Meter Installations Three-Phase Four-Wire Self Contained Switch – Fuse – Meter Sequence Individual Service Ratings 320 A. Max.
Guidebook Standard #16	Typical CT Rated Meter Installation Switch – Fuse – Meter Sequence
Guidebook Standard #17	Typical Single- & Three-Phase Transformer Rated Socket with Mounting Provision for Test Switch
Guidebook Standard #18	Typical Current Transformer Cabinet with CT Rack
Guidebook Standard #19	Typical Metering Enclosures for Primary and Secondary Transformer Rated Meter & Test Switch
Guidebook Standard #20	Up to 320 A – Single-Phase Three-Wire 120/240V Four-Terminal Meter Socket
Guidebook Standard #21	Up to 200 A – Single-Phase Three-Wire 120/208V Network Five-Terminal Meter Socket
Guidebook Standard #22	Up to 320 A – Three-Phase Four-Wire 208Y/120V or 480Y/277V Grounded Wye Seven-Terminal Meter Socket
Guidebook Standard #23	Up to 320 A – Three-Phase Four-Wire 120/240/240V Delta Seven-Terminal Meter Socket
Guidebook Standard #24	Underground Service from Wood Poles
Guidebook Standard #25	Underground Services from Transformers or Hand Holes
Guidebook Standard #28	Flood Plain Metering Requirements

GUIDEBOOK OF REQUIREMENTS: **GUIDEBOOK STANDARDS**



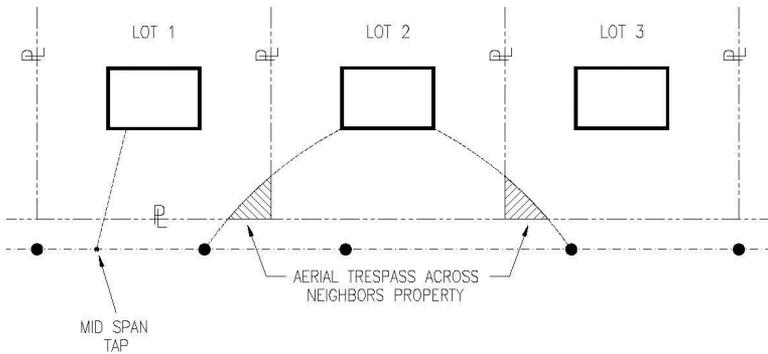
(SEQUENCE #047725) (REVISED 09/29/16 GLG)

ACCEPTABLE SERVICE RUNS



- 1). BEWARE OF TREES
- 2). BEWARE OF GRADE CHANGES UNDER OR AROUND THE SERVICE DROP WHICH WOULD INTERFERE WITH OR REDUCE GROUND CLEARANCE TO BELOW 18 FEET. (12 FEET OVER RESIDENTIAL DRIVEWAYS AND LAWNS)

NOT ACCEPTABLE SERVICE RUNS
AERIAL TRESPASS \ MID SPAN TAP

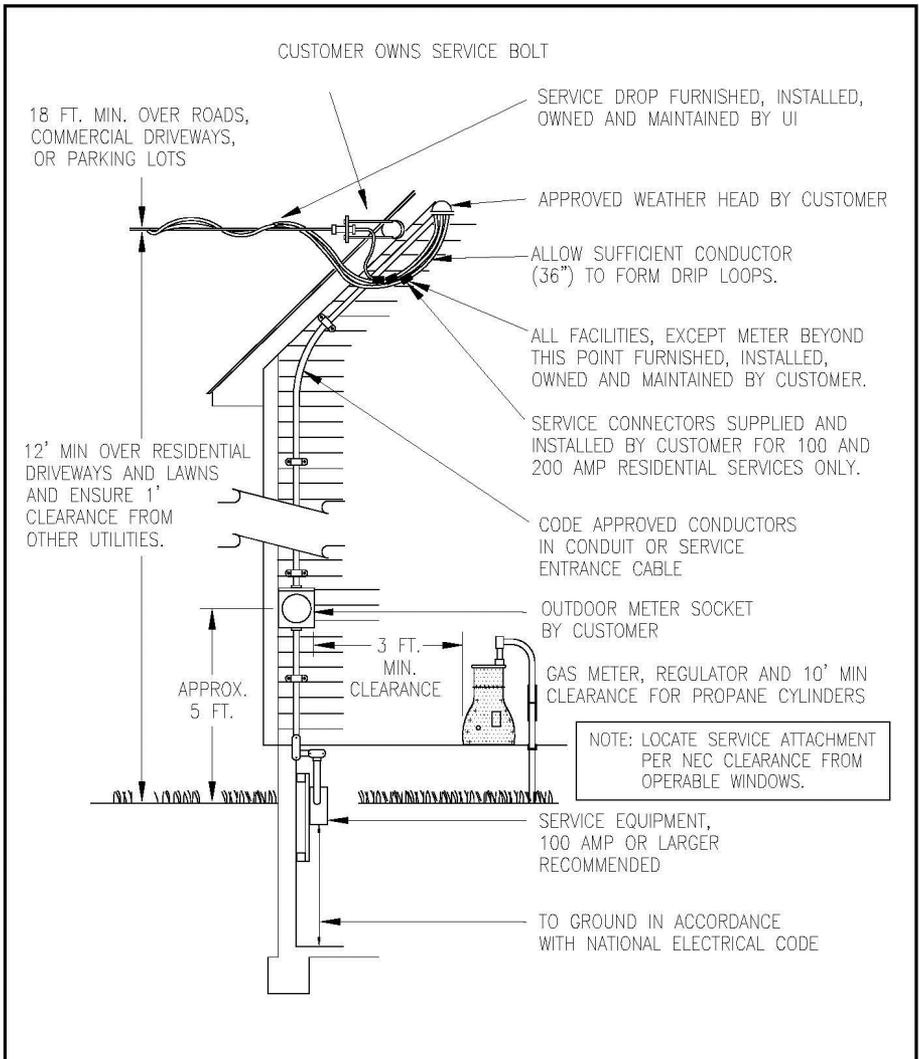


GUIDEBOOK STANDARD #1

**OVERHEAD
SERVICE**

PAGE 2 OF 2

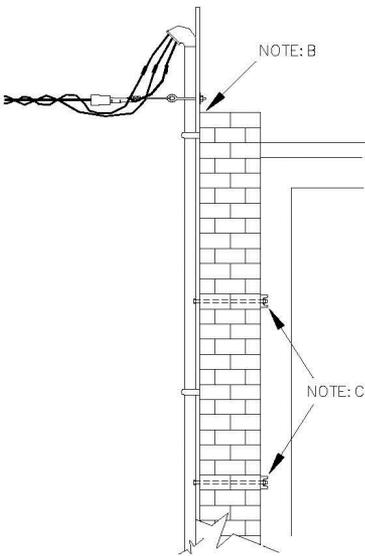
(SEQUENCE #058338) (REVISED 09/29/16 GLG)



GUIDEBOOK STANDARD #2

OVERHEAD SERVICE ENTRANCE FACILITIES

(SEQUENCE #047726) (REVISED 09/29/16 GLG)



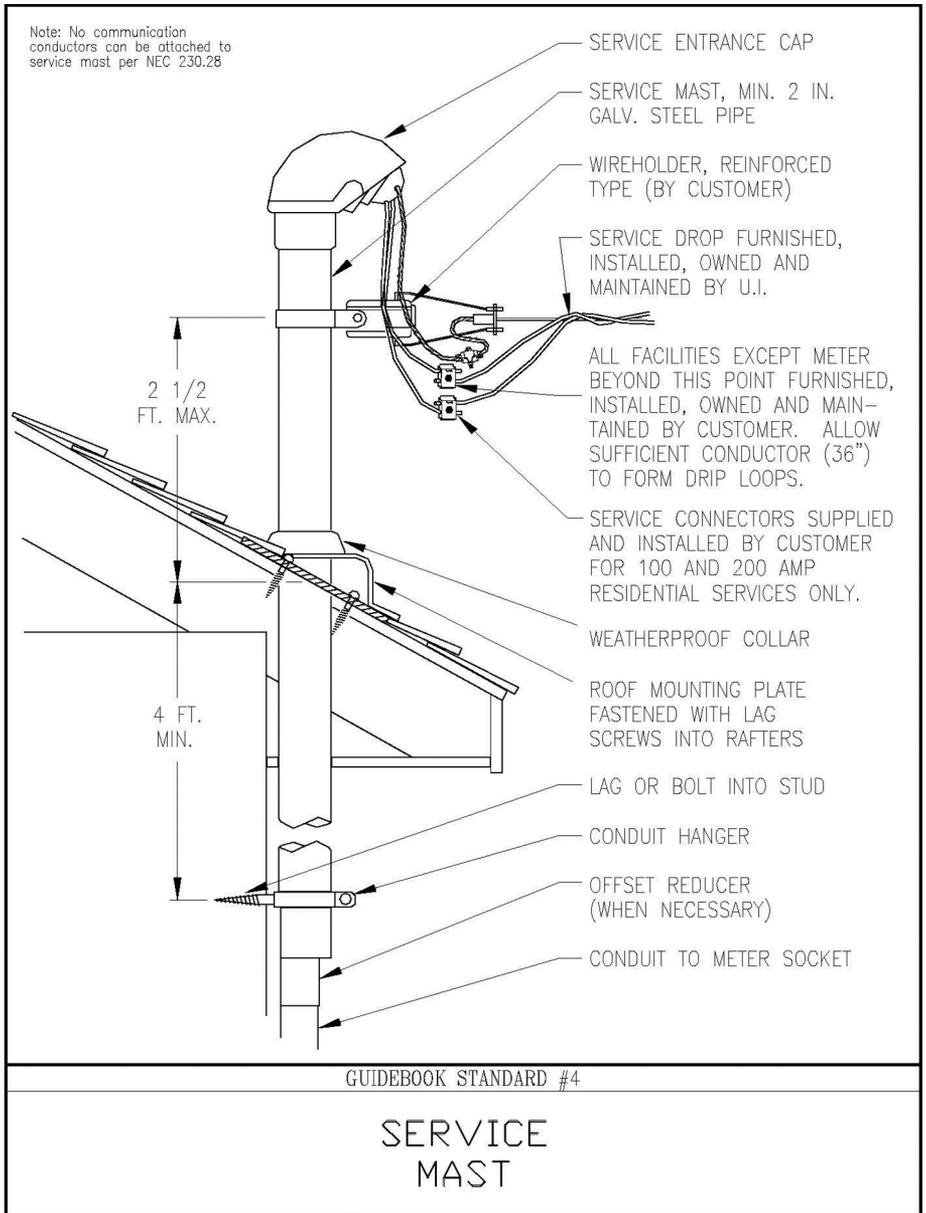
NOTES:

- A. CLEVIS FOR SERVICE CABLE ATTACHMENT, FURNISHED BY UI INSTALLED BY CUSTOMER
- B. ELECTRICAL CONNECTIONS AND MATERIALS SHALL MEET N.E.C., N.E.S.C. AND ANY LOCAL REQUIREMENTS.
- C. SECURING BOLTS SHOULD BE FASTENED DIRECTLY INTO A STRUCTURAL MEMBER OF THE BUILDING OR A 12" PIECE OF CHANNEL IRON.

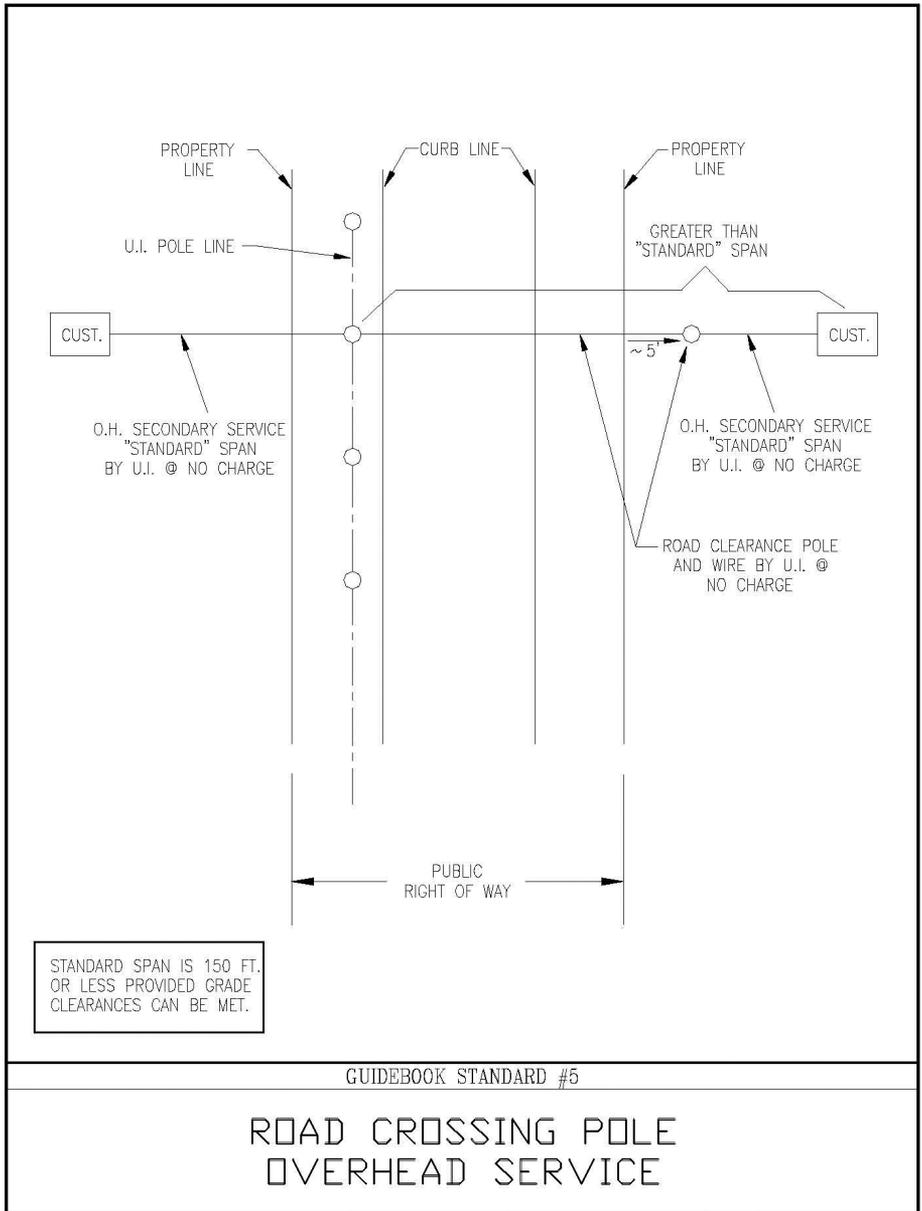
GUIDEBOOK STANDARD #3

SERVICE ATTACHMENT FOR BUILDING

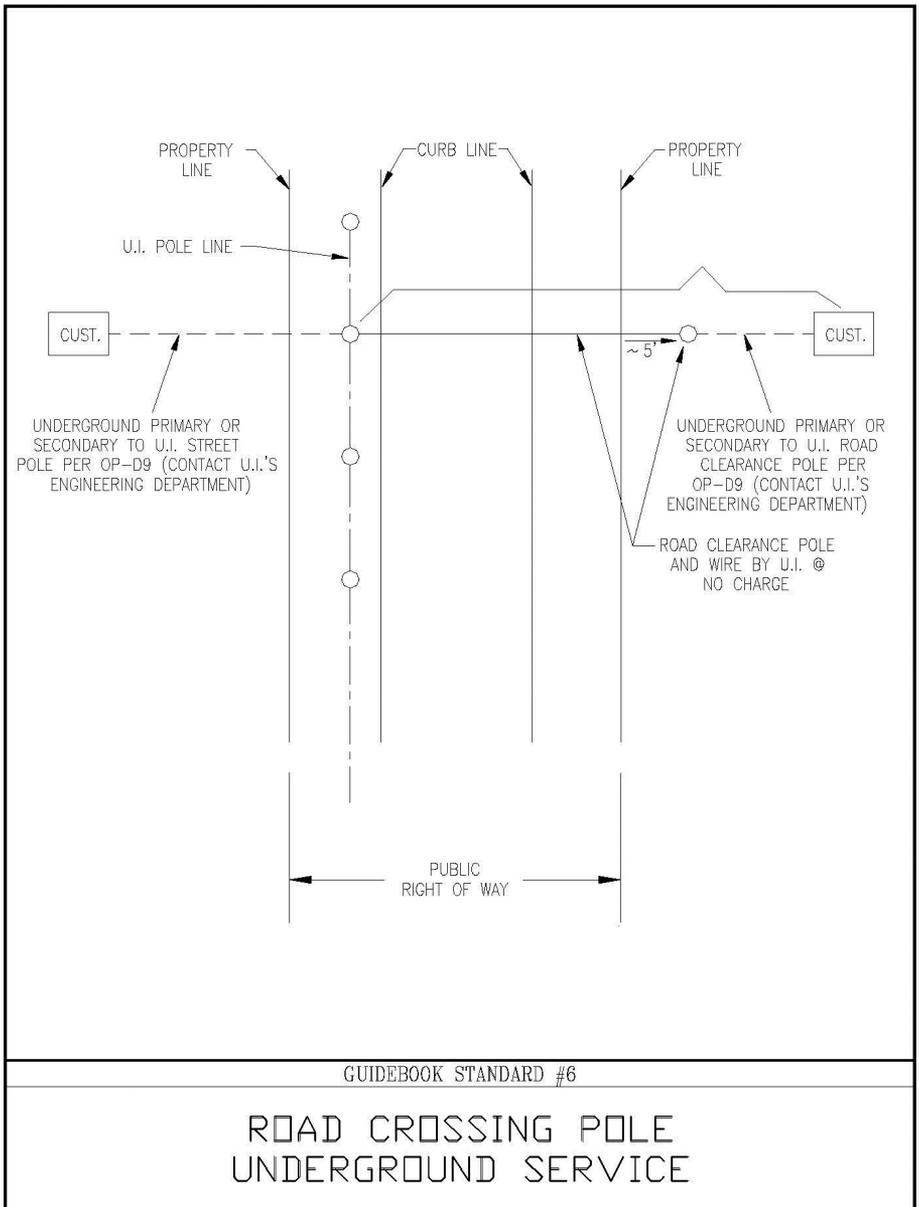
(SEQUENCE #047727) (REVISED 09/29/2016 GLG)



(SEQUENCE #047728) (10/21/2016 G.L.G.)



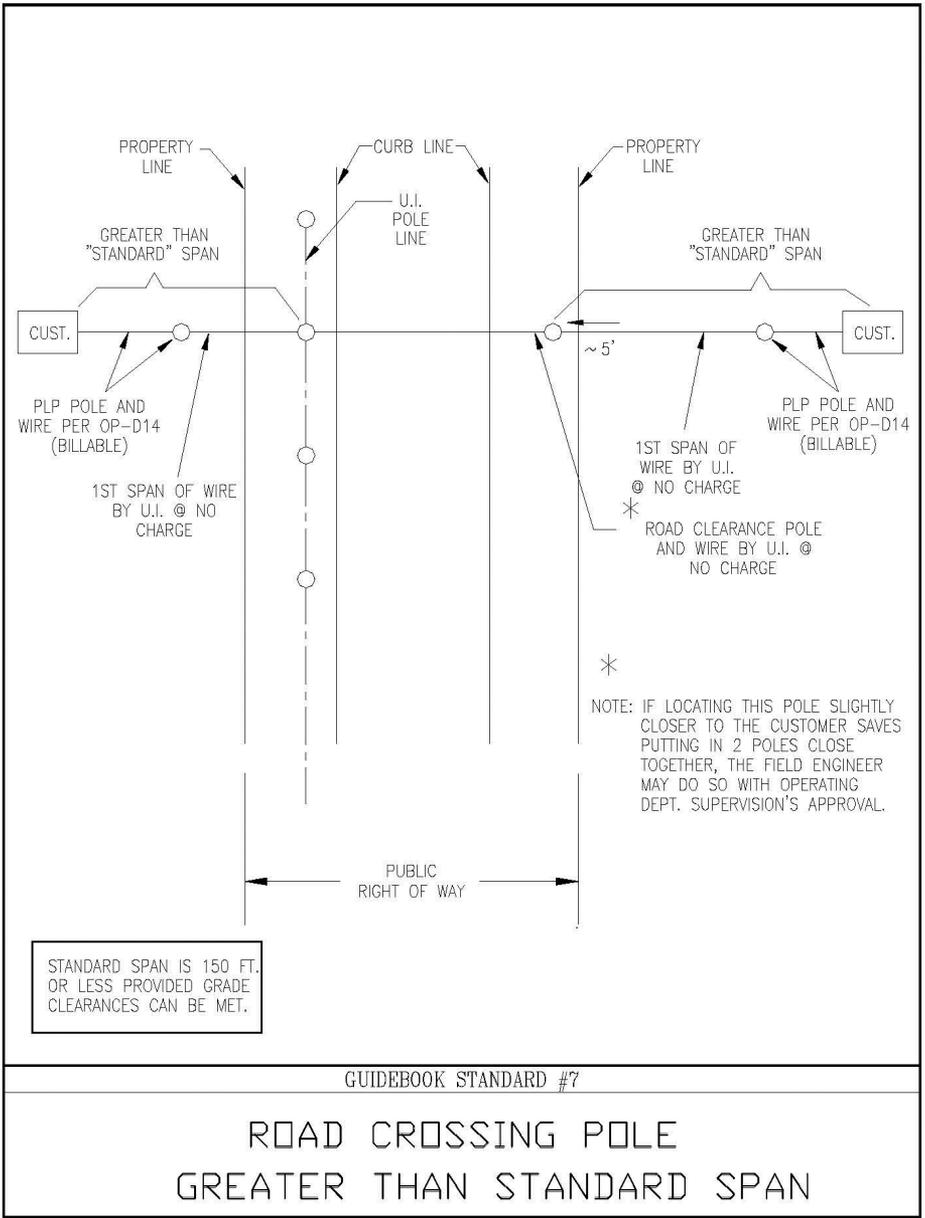
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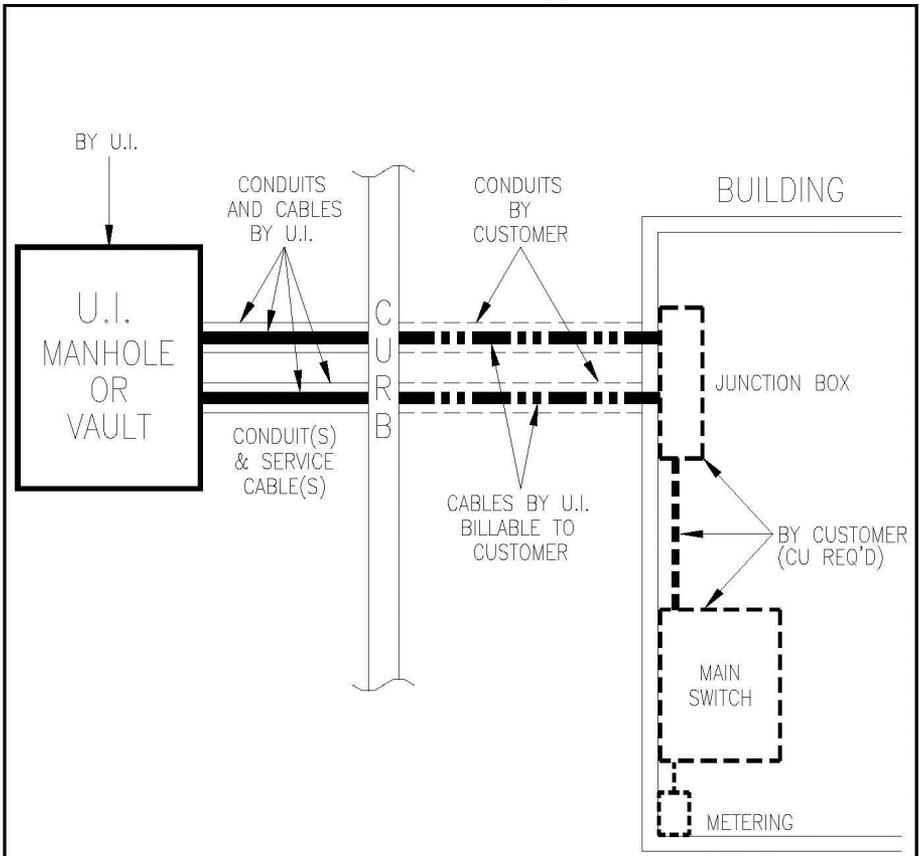
GUIDEBOOK STANDARD #6

ROAD CROSSING POLE
UNDERGROUND SERVICE

(SEQUENCE #047734) (REVISED 08/31/16 GLG)



(SEQUENCE #047735) (REVISED 08/31/16 GLG)



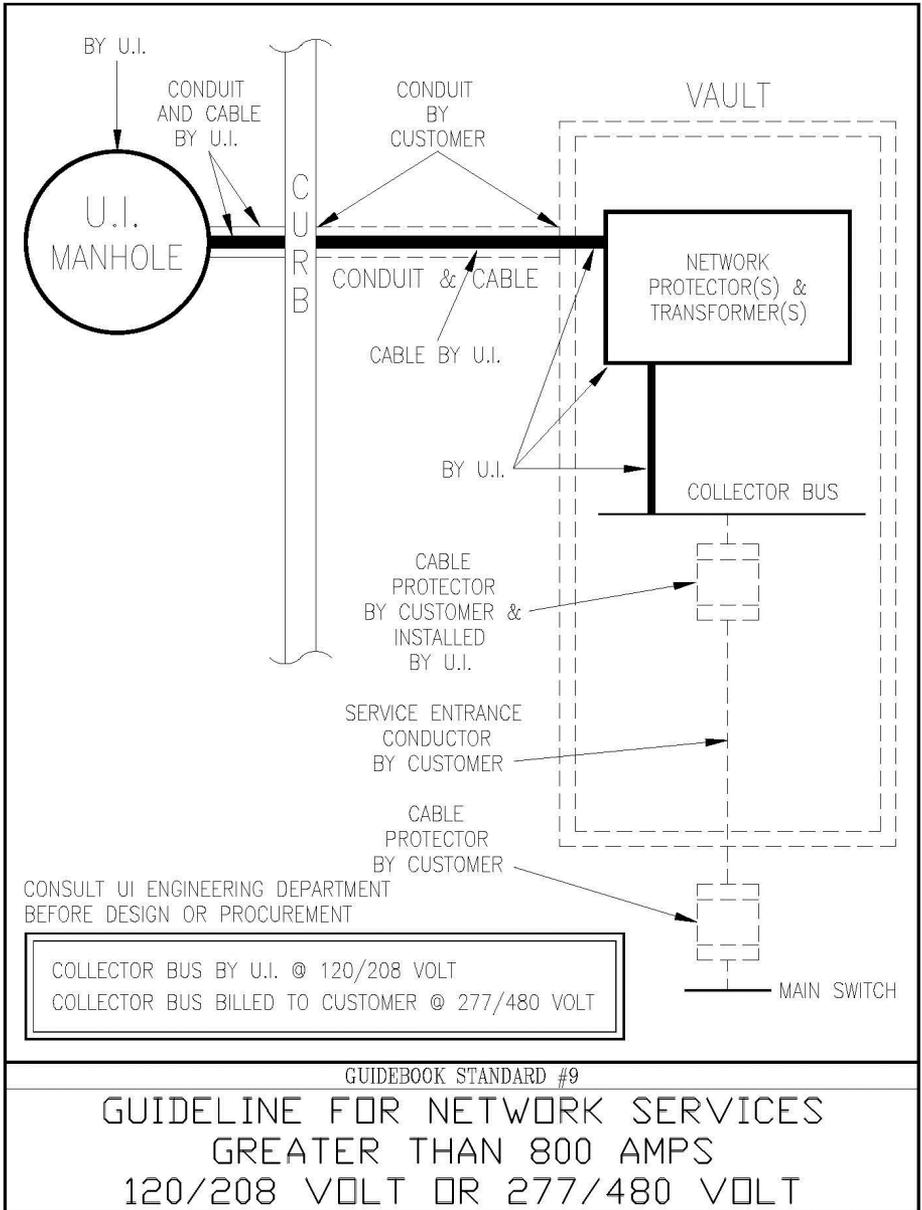
JUNCTION BOX REQUIREMENTS		
200 AMP.	16"x16"x6"	SEE U.I. DWG. 16102-917
400 AMP.	28"x28"x12"	SEE U.I. DWG. 16102-916
600 AMP.	36"x36"x16"	SEE U.I. DWG. 16102-915
800 AMP.		

MAIN SWITCH SHALL BE RATED FOR 200KA SHORT CIRCUIT

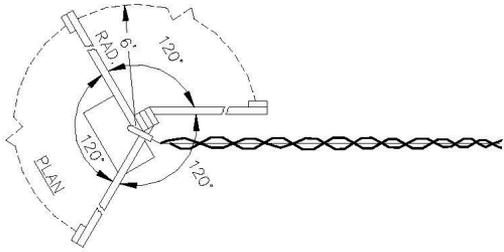
GUIDEBOOK STANDARD #8

GUIDELINE FOR NETWORK SERVICES
800 AMPS OR LESS 120/208 VOLTS

(SEQUENCE #047729) (REVISED GLG 09/29/16)



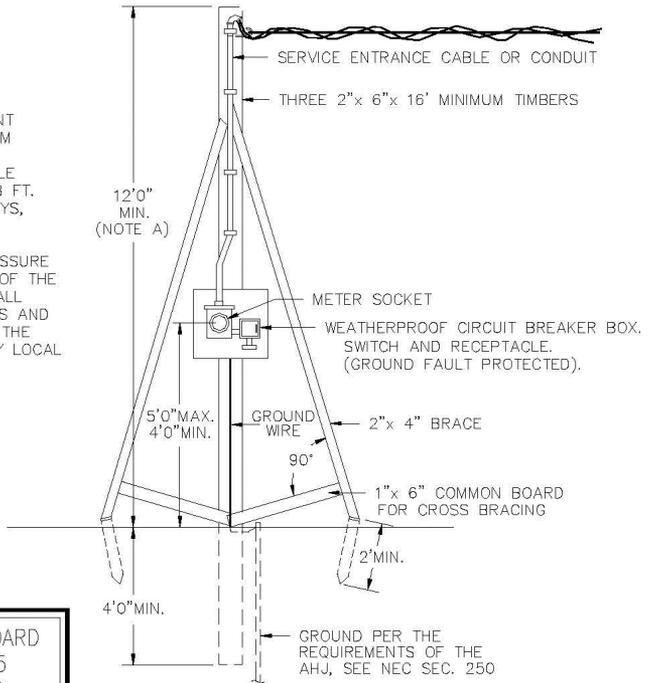
(SEQUENCE #047730) (REVISED 08/31/16 GLG)



NOTES:

A. THE SERVICE ATTACHMENT MUST PROVIDE A MINIMUM CLEARANCE OF 12 FT. ABOVE AREAS ACCESSIBLE TO PEDESTRIANS AND 18 FT. ABOVE DRIVEWAYS, ALLEYS, AND PUBLIC ROADS.

B. THIS STANDARD IS TO ASSURE PROPER CONSTRUCTION OF THE SUPPORTING MEMBERS, ALL ELECTRICAL CONNECTIONS AND MATERIALS SHALL MEET THE N.E.C., N.E.S.C. AND ANY LOCAL REQUIREMENTS.



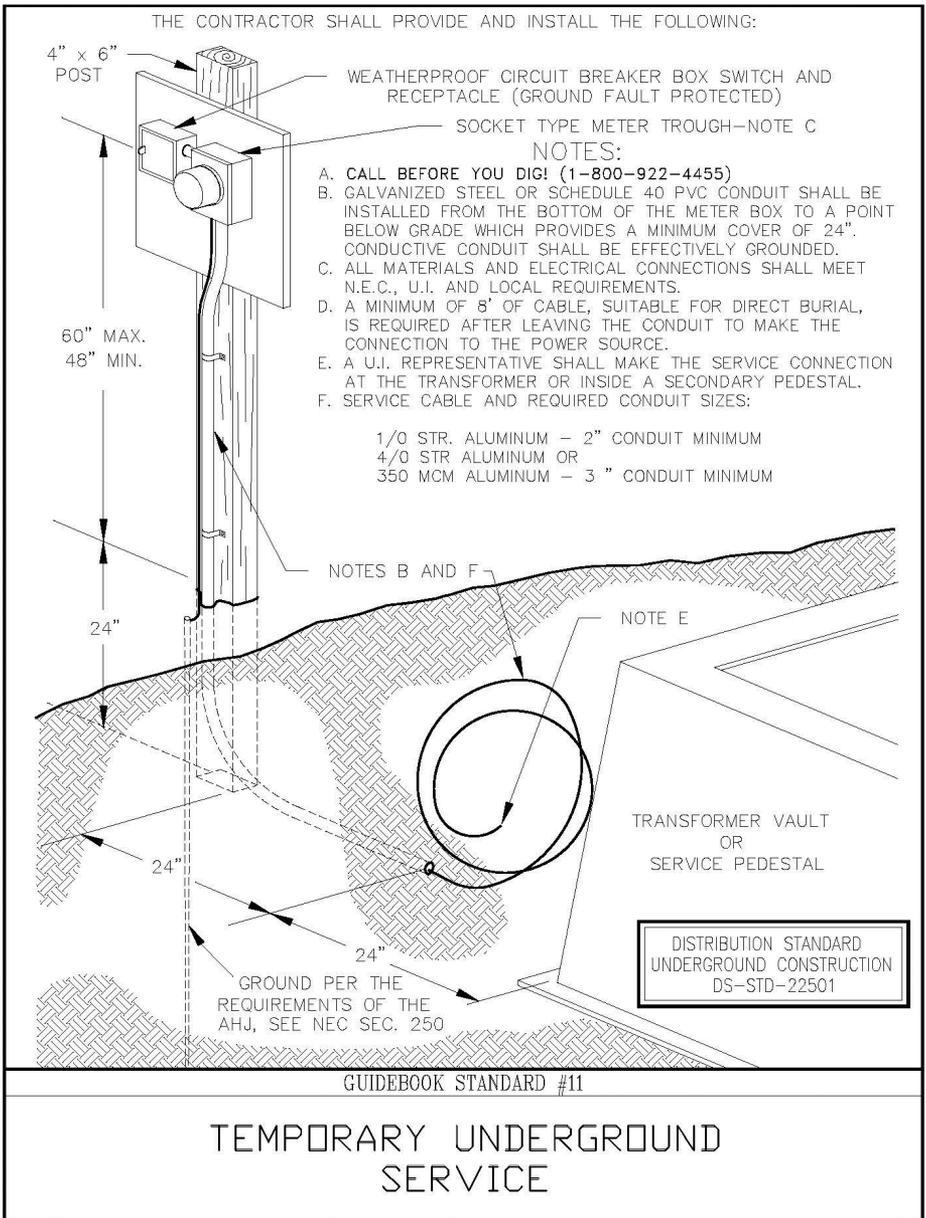
DISTRIBUTION STANDARD
DS-STD-13715
SHEET 1 OF 2

GUIDEBOOK STANDARD #10

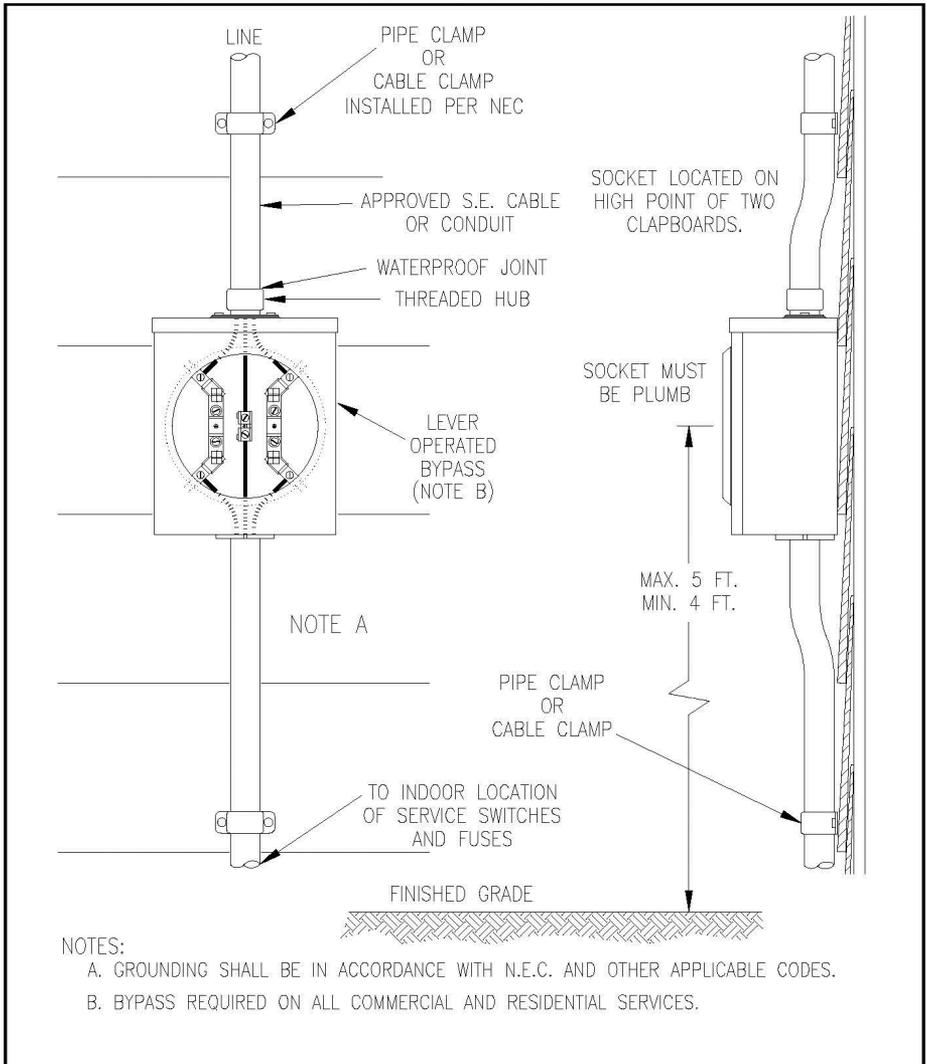
TEMPORARY OVERHEAD SERVICE
POST INSTALLATION

(SEQUENCE #047732) (REVISED 08/31/16 GLG)

GUIDEBOOK OF REQUIREMENTS: **GUIDEBOOK STANDARDS**



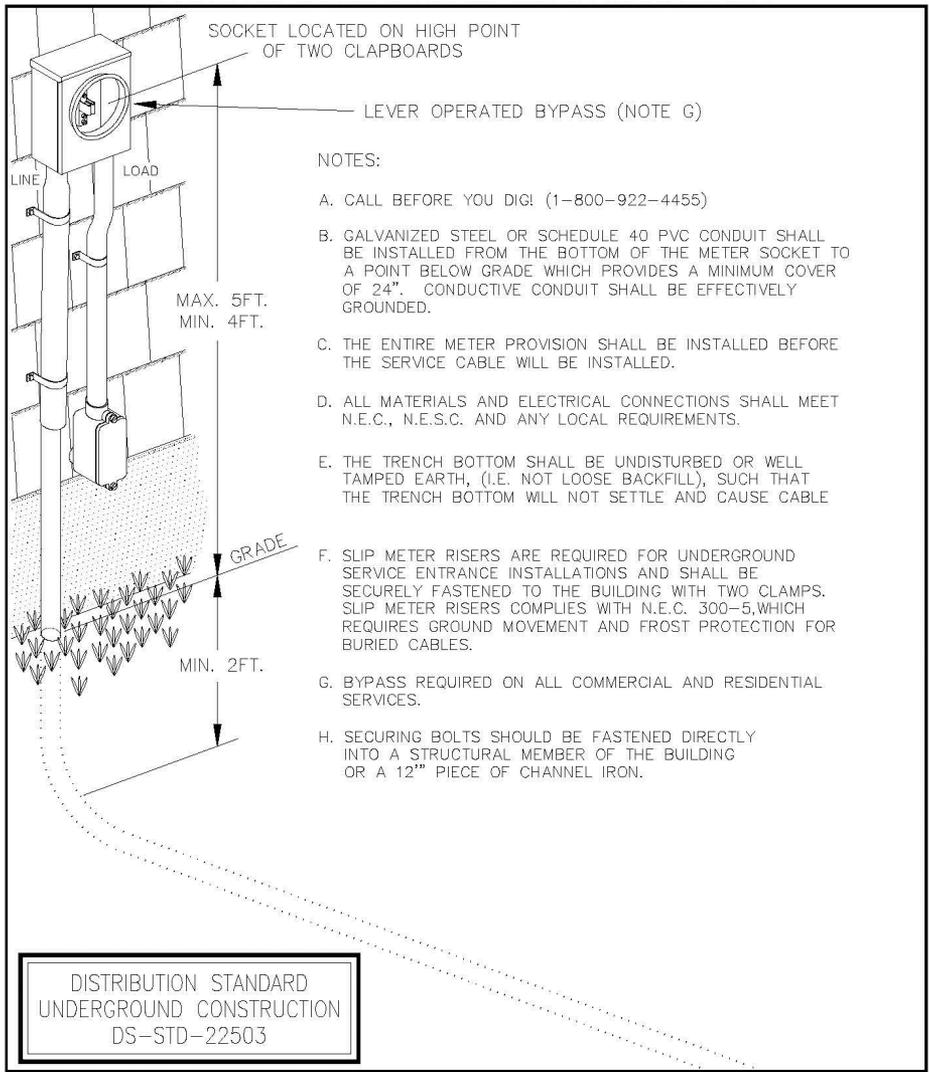
(SEQUENCE #047736) (REVISED 08/31/16 GLG)



GUIDEBOOK STANDARD #12

**TYPICAL OUTDOOR METER INSTALLATION
OVERHEAD 1 PHASE SERVICE
METER - SWITCH - FUSE SEQUENCE**

(SEQUENCE #047754) (REVISED 10/21/16 GLG)



NOTES:

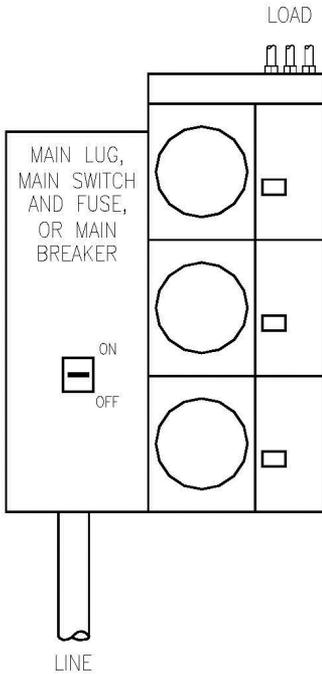
- A. CALL BEFORE YOU DIG! (1-800-922-4455)
- B. GALVANIZED STEEL OR SCHEDULE 40 PVC CONDUIT SHALL BE INSTALLED FROM THE BOTTOM OF THE METER SOCKET TO A POINT BELOW GRADE WHICH PROVIDES A MINIMUM COVER OF 24". CONDUCTIVE CONDUIT SHALL BE EFFECTIVELY GROUNDED.
- C. THE ENTIRE METER PROVISION SHALL BE INSTALLED BEFORE THE SERVICE CABLE WILL BE INSTALLED.
- D. ALL MATERIALS AND ELECTRICAL CONNECTIONS SHALL MEET N.E.C., N.E.S.C. AND ANY LOCAL REQUIREMENTS.
- E. THE TRENCH BOTTOM SHALL BE UNDISTURBED OR WELL TAMPED EARTH, (I.E. NOT LOOSE BACKFILL), SUCH THAT THE TRENCH BOTTOM WILL NOT SETTLE AND CAUSE CABLE
- F. SLIP METER RISERS ARE REQUIRED FOR UNDERGROUND SERVICE ENTRANCE INSTALLATIONS AND SHALL BE SECURELY FASTENED TO THE BUILDING WITH TWO CLAMPS. SLIP METER RISERS COMPLIES WITH N.E.C. 300-5, WHICH REQUIRES GROUND MOVEMENT AND FROST PROTECTION FOR BURIED CABLES.
- G. BYPASS REQUIRED ON ALL COMMERCIAL AND RESIDENTIAL SERVICES.
- H. SECURING BOLTS SHOULD BE FASTENED DIRECTLY INTO A STRUCTURAL MEMBER OF THE BUILDING OR A 12" PIECE OF CHANNEL IRON.

GUIDEBOOK STANDARD #13

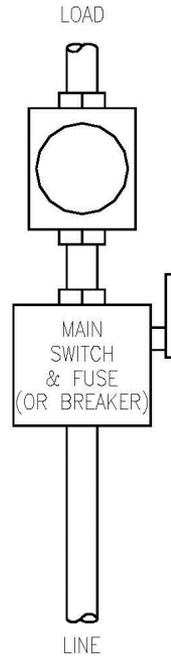
TYPICAL OUTDOOR METER INSTALLATION
UNDERGROUND 1 PHASE SERVICE
METER - SWITCH - FUSE SEQUENCE
SERVICE CABLE IN CONDUIT

(REVISED 10/21/16 GLG)
(SEQUENCE #047731)

MULTI-METER BANK



SINGLE METER



4 JAW - 120/240V 3 WIRE
 5 JAW - 120/208V 3 WIRE

LEVER BYPASS FOR COMMERCIAL, RESIDENTIAL
 AND HOUSE METERS.

NOTES:

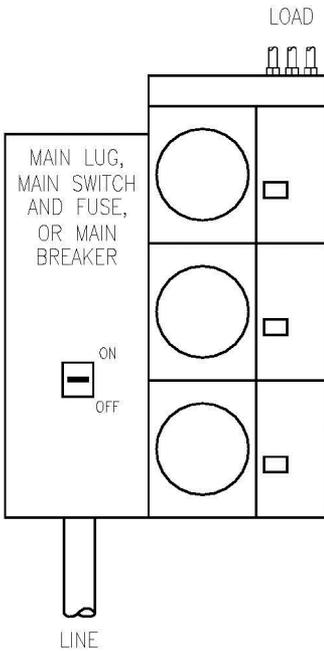
- A. ALL METER(S) SHALL BE LOCATED OUTDOORS. IF A HARDSHIP EXISTS, PERMISSION MUST BE GRANTED IN WRITING BY U.I. TO INSTALL METERS INDOORS.
- B. SUPPLIED, INSTALLED, OWNED, AND MAINTAINED BY CUSTOMER.
- C. REFER TO GUIDEBOOK FOR INSTALLATION REQUIREMENTS.

GUIDEBOOK STANDARD #14

TYPICAL INDOOR METER INSTALLATIONS
 1 PHASE 3 WIRE SELF CONTAINED
 SWITCH - FUSE - METER SEQUENCE
 INDIVIDUAL SERVICE RATINGS 320 AMP. MAX.

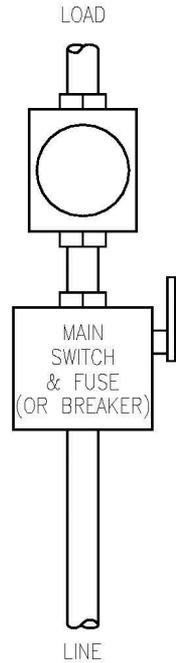
(SEQUENCE #047755) (REVISED 09/29/16 GLG)

MULTI-METER BANK



7 JAW LEVER
BYPASS SOCKETS
FOR 3-PHASE 4 WIRE
APPLICATION

SINGLE METER



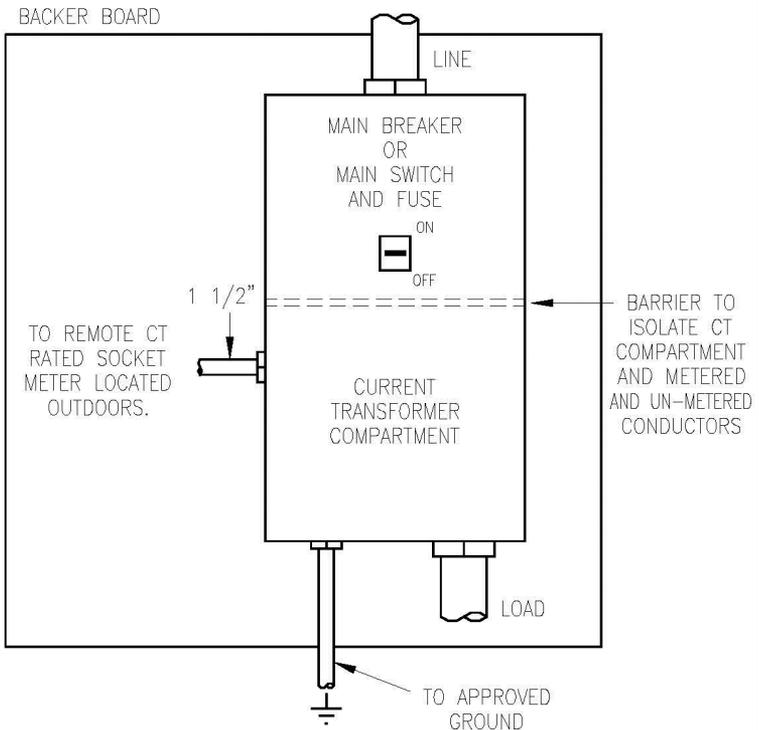
NOTES:

- A. ALL METER(S) SHALL BE LOCATED OUTDOORS. IF A HARDSHIP EXISTS, PERMISSION MUST BE GRANTED IN WRITING BY U.I. TO INSTALL METERS INDOORS.
- B. SUPPLIED, INSTALLED, OWNED, AND MAINTAINED BY CUSTOMER.
- C. REFER TO GUIDEBOOK FOR INSTALLATION REQUIREMENTS.

GUIDEBOOK STANDARD #15

TYPICAL INDOOR METER INSTALLATIONS
3 PHASE 4 WIRE SELF CONTAINED
SWITCH - FUSE - METER SEQUENCE
INDIVIDUAL SERVICE RATINGS 320 AMP. MAX.

(SEQUENCE #047756) (REVISED 08/31/16 GLG)



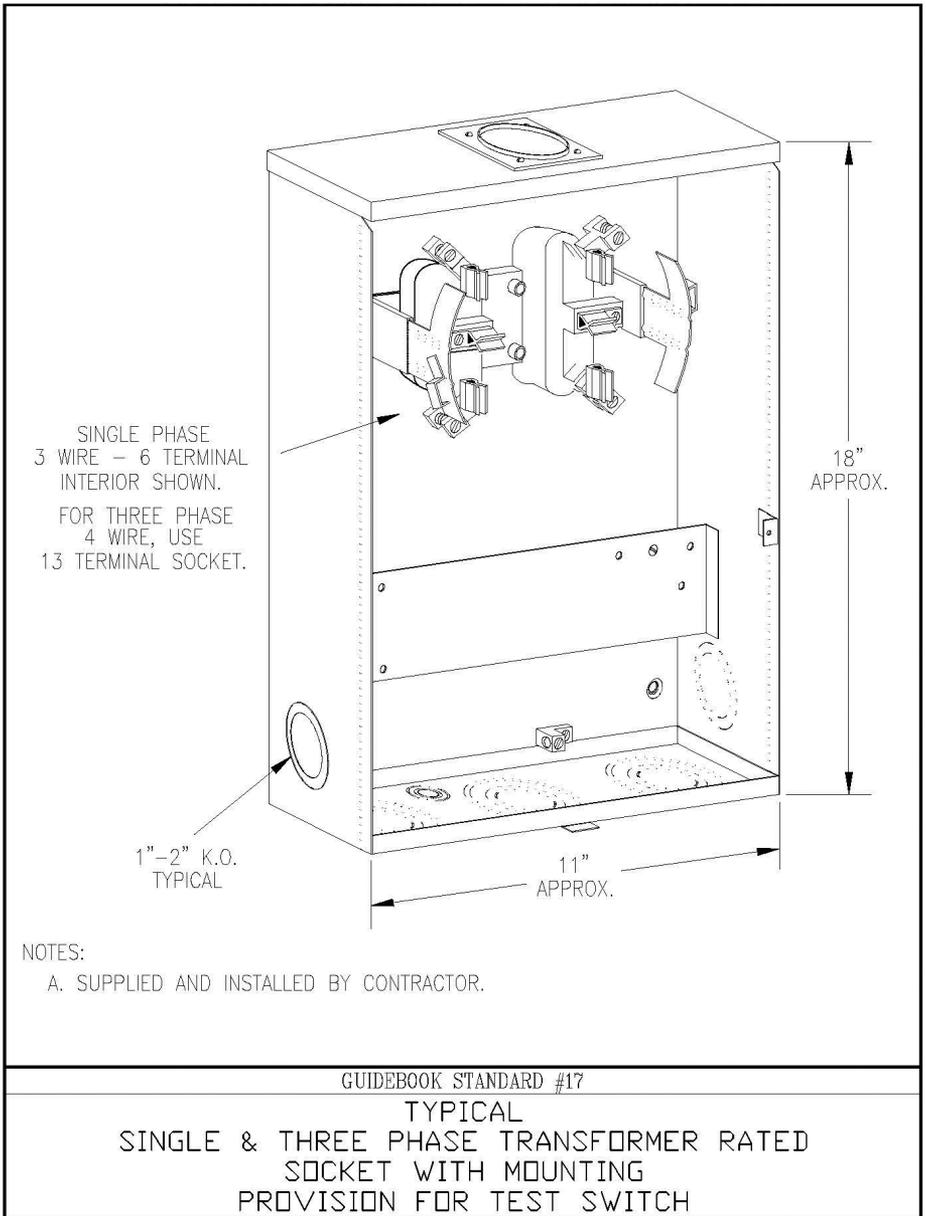
NOTES:

- A. SUPPLIED, INSTALLED, OWNED, AND MAINTAINED BY CUSTOMER.
- B. REFER TO GUIDEBOOK FOR INSTALLATION REQUIREMENTS.
- C. CONSULT WITH METER SERVICE DEPT. BEFORE STARTING ANY JOB WHERE CURRENT TRANSFORMERS WILL BE USED.
- D. CURRENT TRANSFORMER SECONDARY WIRING MUST BE PHYSICALLY ISOLATED FROM LINE SIDE AND LOAD SIDE CONDUCTORS WITHIN THE COMBINATION DEVICE BY MEANS OF A CONDUIT.

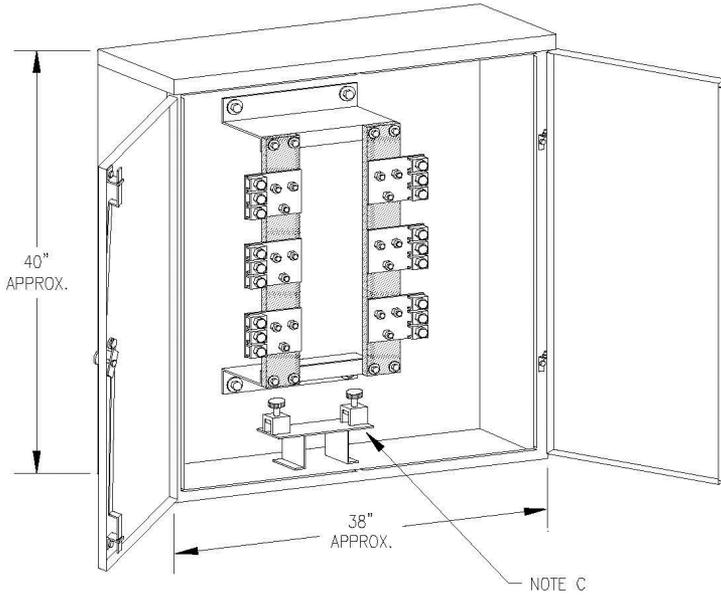
GUIDEBOOK STANDARD #16

TYPICAL CT RATED METER INSTALLATION
SWITCH - FUSE - METER SEQUENCE

(SEQUENCE # 047757) (REVISED 09/29/16 GLG)



(SEQUENCE #047760) (REVISED 08/31/16 GLG)



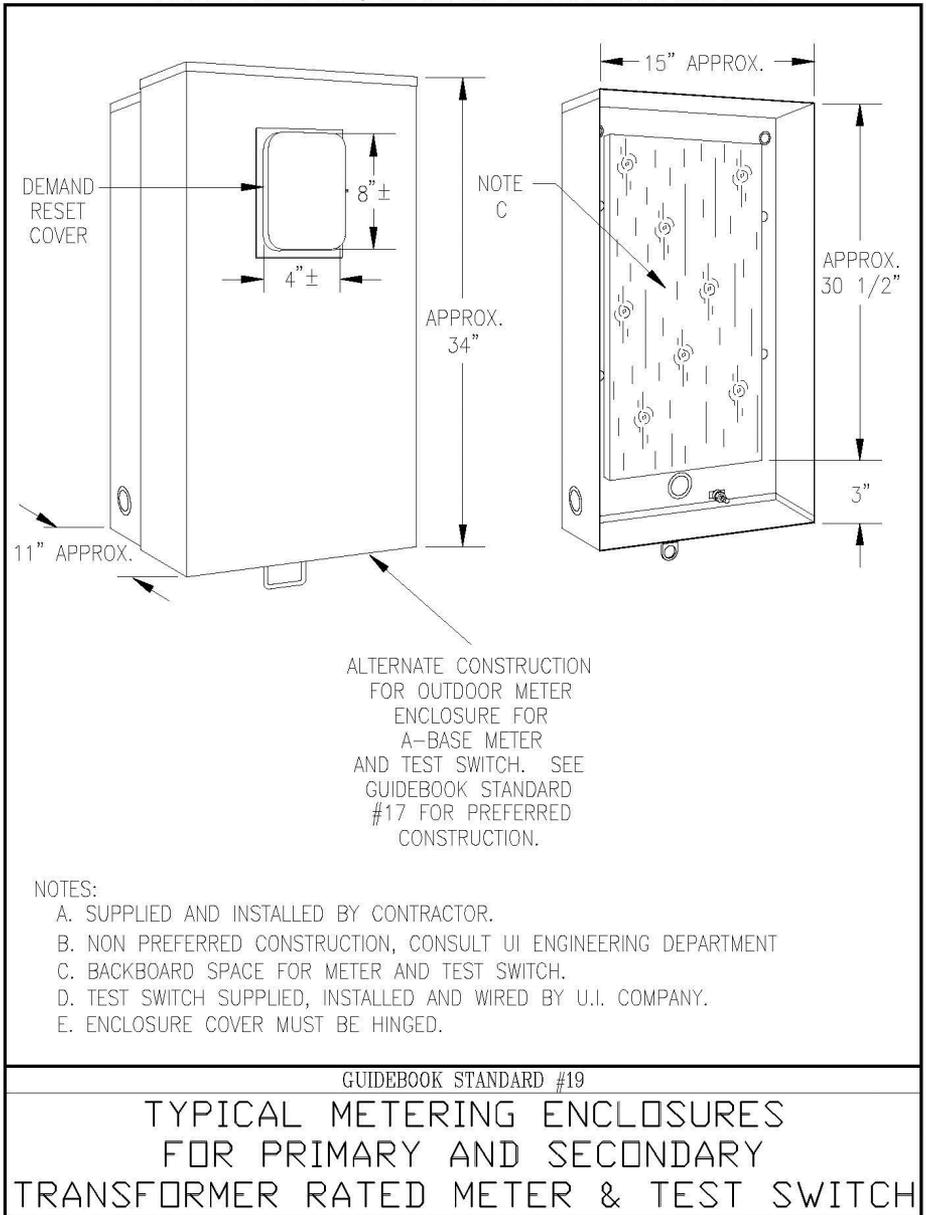
NOTES:

- A. SUPPLIED AND INSTALLED BY CONTRACTOR.
- B. CURRENT TRANSFORMER ENCLOSURES FOR 400–1200 AMPERE SERVICES RATED 480 VOLTS AND BELOW, THE CT ENCLOSURE MUST HAVE MOUNTING PLATES FOR BAR TYPE CURRENT TRANSFORMERS WITH 11 7/8" LONG PRIMARY BARS.
- C. IF NEUTRAL ISOLATION IS REQUIRED, ONLY ISOLATION KITS PROVIDED BY THE CT CABINET MANUFACTURER ARE ACCEPTABLE.

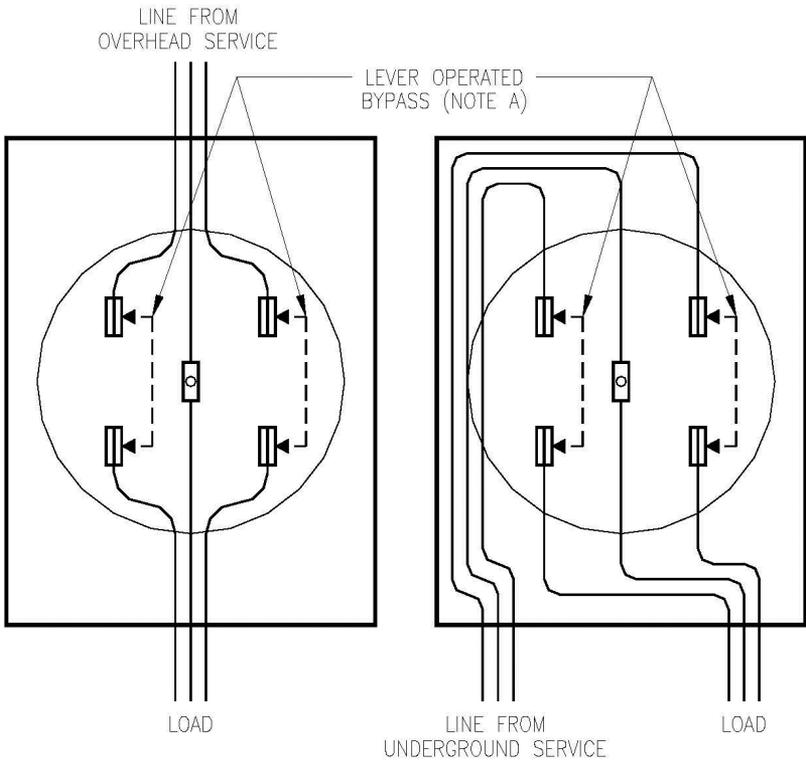
GUIDEBOOK STANDARD #18

TYPICAL
CURRENT TRANSFORMER CABINET
WITH CT RACK

(SEQUENCE #047759) (REVISED 09/29/16 GLG)



(REVISÉD 09/29/16 GLG)
 (SEQUENCE #047758)



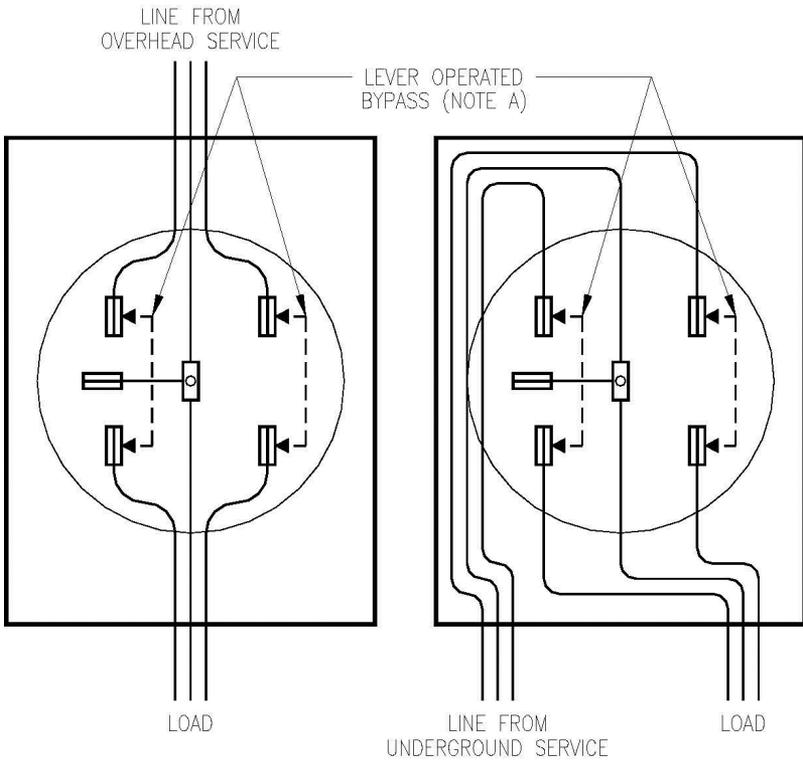
NOTES:

A. BYPASS REQUIRED ON ALL COMMERCIAL AND RESIDENTIAL SERVICES.

GUIDEBOOK STANDARD #20

UP TO 320 AMP - 1 PHASE 3 WIRE
120/240V
4 TERMINAL METER SOCKET

(SEQUENCE #047748) (REVISED 08/31/16 GLG)



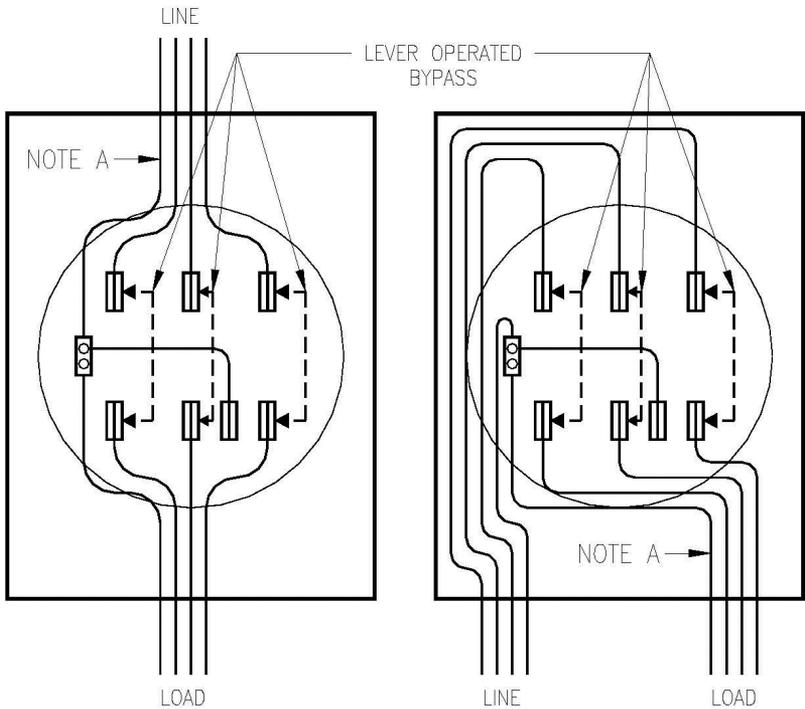
NOTES:

A. BYPASS REQUIRED ON ALL COMMERCIAL AND RESIDENTIAL SERVICES.

GUIDEBOOK STANDARD #21

UP TO 200 AMP - 1 PHASE 3 WIRE
 120/208V NETWORK
 5 TERMINAL METER SOCKET

(REVISD 09/29/16 GLG)
 (SEQUENCE #047750)



ALL 480Y/277V APPLICATION MUST BE COLD SEQUENCE. REFER TO GUIDEBOOK SECTION 10 METERING FOR ADDITIONAL REQUIREMENTS.

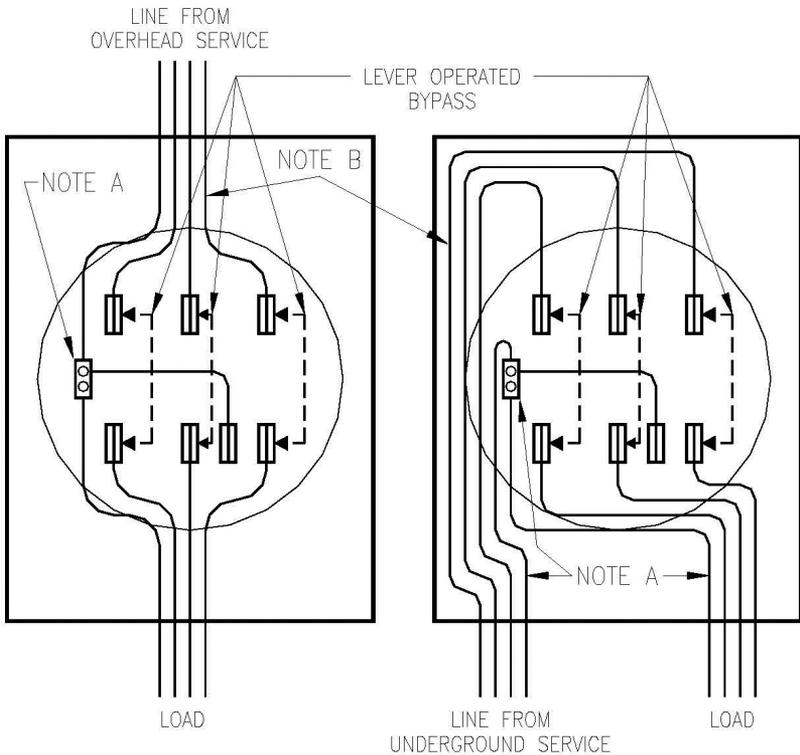
NOTES:

- A. INSULATED GROUNDABLE NEUTRAL. THIS TERMINAL MUST BE CONNECTED AS FOLLOWS:
 - IF THE SEQUENCE IS METER-SWITCH-FUSE THEN BOND THIS NEUTRAL TO THE ENCLOSURE WITH THE STRAPS PROVIDED.
 - IF THE SEQUENCE IS SWITCH-FUSE-METER THEN THIS NEUTRAL MUST BE CONNECTED IN ACCORDANCE WITH N.E.C.

GUIDEBOOK STANDARD #22

UP TO 320 AMP - 3 PHASE 4 WIRE
 208Y/120V OR 480Y/277V GROUNDED WYE
 7 TERMINAL METER SOCKET

(REVISÉD GLG 09/29/16)
 (SEQUENCE #047751)



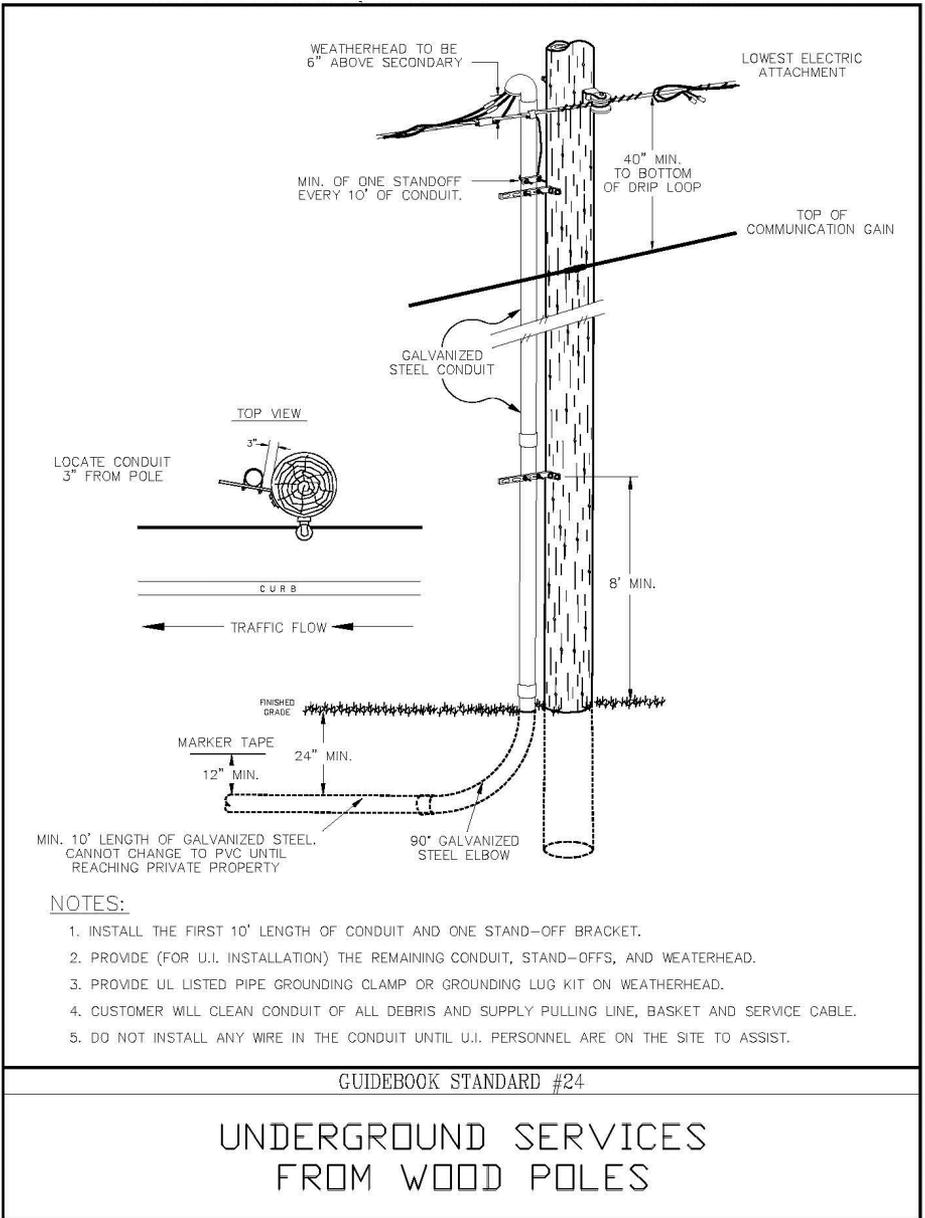
NOTES:

- A. INSULATED GROUNDABLE NEUTRAL. THIS TERMINAL MUST BE CONNECTED AS FOLLOWS:
 - IF THE SEQUENCE IS METER-SWITCH-FUSE THEN BOND THIS NEUTRAL TO THE ENCLOSURE WITH THE STRAPS PROVIDED.
 - IF THE SEQUENCE IS SWITCH-FUSE-METER THEN THIS NEUTRAL MUST BE CONNECTED IN ACCORDANCE WITH N.E.C..
- B. LINE AND LOAD SERVICE ENTRANCE CONDUCTOR HAVING THE HIGHER VOLTAGE TO NEUTRAL (APPROX. 208V) SHALL BE ON THE RIGHT AND IDENTIFIED BY ORANGE COLORED CONDUCTOR.

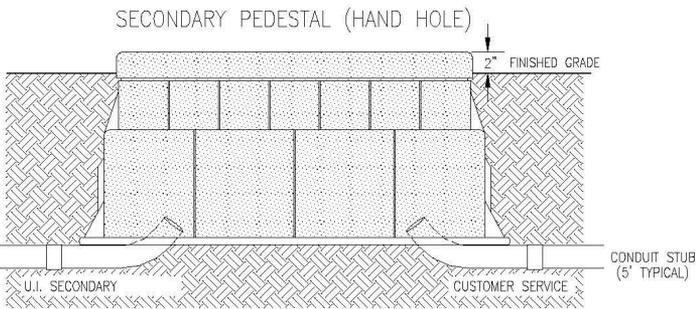
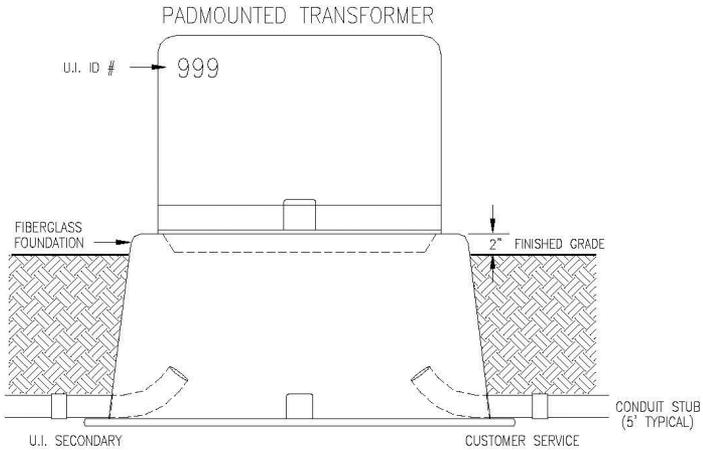
GUIDEBOOK STANDARD #23

UP TO 320 AMP - 3 PHASE 4 WIRE
 120/240/240V DELTA
 7 TERMINAL METER SOCKET

(REVISID 09/29/16 GLG)
 (SEQUENCE #047753)



(SEQUENCE #061138) (REVISED 09/29/16) GLG

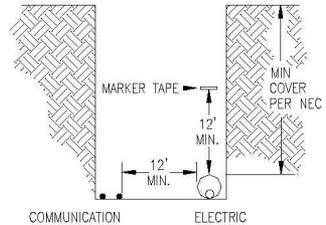


GROUNDING PER STANDARD DCS 23001

NOTES:

1. LOCATE THE CONDUIT STUB WHICH TYPICALLY EXTENDS 5' FROM BOX.
2. IF NO STUB IS AVAILABLE, CONTACT U.I. ENGINEERING FOR ASSISTANCE.
3. DO NOT ATTEMPT TO INSTALL CONDUIT INTO TRANSFORMER OR HAND HOLE.
4. CUSTOMER MUST CLEAN CONDUIT OF ALL DEBRIS AND SUPPLY PULLING LINE AND BASKET.
5. DO NOT INSTALL ANY WIRE IN THE CONDUIT UNTIL U.I. PERSONNEL ARE ON SITE TO ASSIST.

TYPICAL CUSTOMER SERVICE TRENCH < 600V



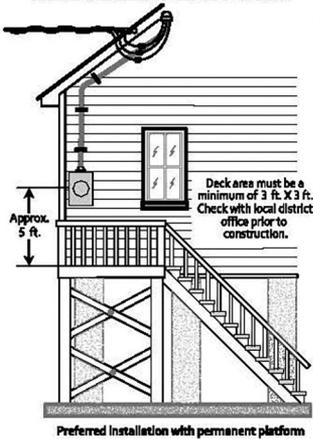
GUIDEBOOK STANDARD #25

UNDERGROUND SERVICES FROM TRANSFORMERS OR HAND HOLES

(SEQUENCE #061139) (REVISED 09/29/16 GLG)

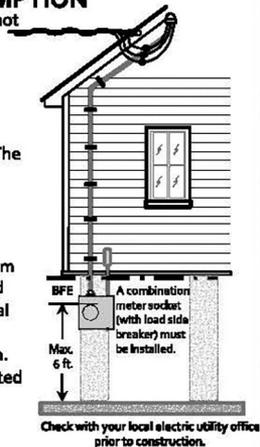
In the Coastal Flood Plain areas FEMA guidelines require that electrical equipment must be installed above the level of the Base Flood Elevation (BFE). The height of the BFE varies depending on your location and can be supplemented by the Design Flood Elevation (DFE) which is additional height required by a town. These guidelines may result in the meter socket being installed well above CL&P's and UI's foot height requirement. To allow safe access to the meter by the Company employees, the customer shall be required to construct a suitable stepped platform or other means meeting local code and FEMA requirements **prior** to energizing the service.

REQUIRED PLATFORM



EXEMPTION

If a suitable platform can not be constructed due to zoning or the physical location of the service an approved combination meter socket can be installed below the BFE. The Customer must fill out an "INSTALLATION OF THE ELECTRIC METER BELOW THE BASE FLOOD ELEVATION" form. This form must be signed by you and the building /zoning official of your town stating the reasons for this exemption. This form must be submitted prior to the installation of the new or upgraded electrical service.



You must acknowledge and agree to the following conditions for this exemption:

1. The customer must install an approved combination meter socket. This is a meter socket that has the main breaker provision built into it. In the event of flooding the main breaker will trip upon submersion in water de-energizing the power to the home.
2. In the event of flooding, the customer is responsible to have the combination meter socket inspected and/or replaced before the service can be re-energized.
3. Installing the meter socket below the BFE may affect the customer's insurance. The customer is responsible for checking with their insurance company prior to submitting the application.
4. Depending on the degree and nature of the flooding and storm damage your service will most likely be disconnected at the pole due to submersion of the meter and main breaker by flood water. This may increase the restoration time for your service due to repair/ replacing the combination meter socket and service entrance equipment.

GUIDEBOOK STANDARD #28
**FLOOD PLAIN
 METERING
 REQUIREMENTS**

(SEQUENCE #08768) (REVISED 10/21/16 GLG)

APPENDIX A - DEFINITIONS

For additional definitions, refer to Section 100 of the National Electrical Code.

Authority Having Jurisdiction (AHJ): An organization, office or individual responsible for enforcing the requirements of a code or standard or for approving equipment, materials, an installation or a procedure. (NEC)

Code(s): The State of Connecticut approved version of the National Electrical Code and/or applicable state or local codes and ordinances.

Conduit System: UI's electrical distribution facilities installed underground.

Current Transformer (CT): Provides a low magnitude current for metering which is proportional to the higher current being measured. Current transformers, together with potential transformers (PTs), are known as instrument transformers.

GenerLink: A device that is installed behind the UI electric meter for connecting an emergency generator. The device automatically disconnects your house from the electric utility grid when using a generator, preventing the possibility of backfeed.

Instrument Transformer Installations: An electrical service that requires current transformers and/or potential transformers.

Licensed Electrician: An electrical contractor holding a valid E-1 or E-9 license issued by the State of Connecticut, Department of Consumer Protection – Occupational & Professional Licensing Division. The Licensed Electrician is responsible for all work performed under this Guidebook.

E-2 License Holder can only perform electrical work while under the employ of a contractor licensed for such work.

E-9 License Holder is restricted to residential and light commercial work only.

Listed: Equipment, materials or services, included in a list published by an organization and concerned with evaluation of products or services, that maintain periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material or services meet identified standards or have been tested and found suitable for a specified purpose.

Local Municipal Authority: A duly appointed building code official, responsible for inspecting and ensuring that contractor work is in compliance with all applicable local, state and federal regulations.

Meter Seals: Allow UI to prevent and reveal meter tampering attempts.

Metering Sequence – Cold Sequence: (Switch-Fuse-Meter) Main breaker or fusible switch required before the self-contained meter or instrument transformers.

Metering Sequence – Hot Sequence: (Meter-Switch-Fuse) No means of disconnect before meter.

Network System: A distribution system which connects the secondary of multiple distribution transformers for supplying power to a customer's service. These are special systems located in downtown areas of Bridgeport and New Haven.

Potential Transformer (PT): Provides a low magnitude voltage for metering which is proportional to the higher voltage being measured. Potential transformers, together with current transformers (CTs), are known as instrument transformers.

Public Utilities Regulatory Authority (PURA): Statutorily charged with regulating the rates and services of UI. PURA balances the public's right to safe, adequate and reliable utility service at reasonable rates with UI's right to a reasonable return on its investment.

Self-Contained Meter: A meter capable of measuring the entire amperage of the electric service without the use of current and/or voltage transformers.

Service: The conductors and equipment for delivery of electric energy from the serving utility to the wiring system of the premises served. (NEC)

Service Equipment: The necessary equipment, usually consisting of a circuit breaker(s) or Switch(es) and fuses and their accessories, connected to the load end of the service conductors to a building or other structure or an otherwise designated area and intended to constitute the main control and cutoff of the supply. (NEC)

Service Lateral: The underground service conductors and conduit starting at the street main, at the top of a riser on a pole, from a transformer or other structure, and connecting to the service point.

Service Location: The approved point of attachment of our service drop or the approved point of entry of our service lateral to the building.

Service Point: The point of connection between the facilities of the serving utility and the premises wiring. (NEC)

Service Spotting: The process by which the service location is determined.

Surge-Protective Device (SPD): A protective device for limiting transient voltages by diverting or limiting surge current. (NEC) (UL 1449)

Theft of Services (TOS) The legal term for a crime which is committed when a person obtains valuable services by deception, force, threat or other unlawful means, i.e., without lawfully compensating the provider for these services.

Underground Duct and Manhole System: UI's electrical distribution facilities installed in the ground in manholes (splice chambers), vaults, duct banks, pads, etc.



100 Marsh Hill Road
Orange, CT 06477