



Kotzebue Electric Association

Electric Service Requirements

For Single and Multi-Residential, Commercial and Industrial Installations

MISSION STATEMENT

Kotzebue Electric Association, Inc., a locally-owned utility dedicated to cooperative principles, will make electric energy, and other value added utility services and products, available to its members at the lowest cost consistent with sound economic and management practices, which improves utility services and the quality of life in our service area.

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Kotzebue Electric Association, Inc.

Electric Service Requirements For Single and Multi-Residential, Commercial, and Industrial Installations

Kotzebue Electric's goal is to provide high quality electric service at the lowest cost consistent with sound business practices, wise use of resources and good management.

INTRODUCTION

Please read each page thoroughly.

This booklet was designed to assist prospective Kotzebue Electric Association, Inc. (KEA) Co-op Member/Owners in their dealings with KEA and to supplement KEA's rates, charges, rules, and regulations as filed with the Regulatory Commission of Alaska (RCA).

The information in this booklet is intended to cover particular issues of concern to Co-op Members, architects, engineers, and electrical contractors regarding electric service installations. This information, however, does not constitute a complete set of rules governing proper procedures for installing electrical equipment. If installing electrical equipment, Co-op Members are solely responsible to ensure that electrical work is performed in accordance with the National Electrical Code (NEC), the rules of regulatory agencies having jurisdiction, and KEA's Electric Service Requirements.

Changes in the contents of this booklet may become necessary from time to time and KEA reserves the right to make such changes without notice to the holders of this booklet. Addenda and correction sheets reflecting any changes will be available upon request from KEA.

A copy of KEA's tariff, including all rates, charges, rules and regulations is available at KEA's office for public inspection during regular business hours. KEA personnel will provide tariff assistance upon request.

Authority

The authority for establishing and enforcing the service requirements stated in this booklet is derived from KEA's tariff as approved by the Board of Directors and filed with the RCA.

General Information

1. KEA will provide electric service connections to Co-op Members' premises strictly in accordance with KEA's service requirements and tariff. General factors affecting KEA's ability to provide electric service connections include weather, terrain conditions, and availability of funds, manpower, and materials.
2. In order to provide the safest and most economical installation of KEA's facilities, KEA will determine the point of electric service connection to a Co-op Member's premises as well as the method of installation. Specifically, the point of electric service connection is defined to be the location where KEA's facilities connect to the Co-op Member's primary or secondary voltage service entrance equipment.
3. In order to obtain and maintain an electric service connection, the electrical service entrance equipment installed by the Co-op Member must be installed in accordance with the requirements set forth in this booklet. Portions of electrical installations not covered in this booklet must meet the requirements of the National Electrical Code (NEC).
4. Co-op Members should direct all inquiries regarding rates, charges, rules, regulations, and electric service requirements to KEA.

5. Drawings 1 through 10 of this booklet illustrate suggested methods for the installation of single-residential electric service entrance equipment.
6. Drawing 11 of this booklet illustrates the required grounding for multiple metered services without main disconnect while Drawing 12 illustrates the required grounding for Current Transformer (CT) metered services.
7. Any exceptions to the requirements in this booklet must be approved in writing by KEA prior to ordering and installing equipment.

FROM APPLICATION TO NEW SERVICE CONNECTION

This section will assist new Co-op Members as they proceed from the application for electric service through to its final connection. This section also discusses the roles and responsibilities of KEA and Co-op Members. Knowledge of individual responsibilities helps to avoid misunderstandings and helps the process to run smoother and faster.

First Steps

Planning for your electrical needs well in advance is the all-important first step. If there is adequate planning then you will have enough time to complete your requirements prior to the electrical hookup. Also, KEA will have enough time to design and complete the job in a timely manner. This is especially important during the hectic summer and fall seasons when KEA's crews are busy with numerous construction projects and electrical hookups.

To get an electric service connection, you must first be a KEA Co-op Member. If you are not yet a Co-op Member, you must complete and sign an Application For Membership Form. You can pick up a copy from KEA's office or print one out from KEA's online website:

www.kea.coop

Once you are a Co-op Member, you can request an electric service connection by completing and signing a Job Order Form. You can pick up a copy from KEA's office. This form allows you to specify the work you want done as well as when you want the work to be completed.

When choosing this date, consider the complexity of the job and try to allow yourself and KEA ample time to complete all of the tasks required prior to the final construction. KEA will make every attempt to meet your schedule. Co-op Members should be aware, however, that KEA has final responsibility for scheduling its crews for all jobs as well as for completing them economically.

Site Location Data

In addition to the general information supplied on the Job Order Form, the Co-op Member must supply the following items regarding site's location to KEA:

1. Legal description of the property to be served as well as proof of ownership.
2. City of Kotzebue address of the property to be served.
3. A detailed sketch showing area roads, driveways, property corners, and any buildings or other improvements on the site.
4. Accurately staked and flagged corners of future buildings if construction is not yet underway.

Site Evaluation and Power Line Extension Criteria

After KEA receives a Job Order from a Co-op Member, KEA personnel will visit the property to evaluate the criteria for a power line extension to the site and to determine requirements for a possible connection.

In order to justify the cost of extending a power line to the site, there must be sufficient qualifying permanent improvements on the premises. Qualifying permanent improvements are residential buildings or commercial plants having dry, all-weather access in addition to having the potential for long-term electrical use. KEA will factor in the existence of gravel pads and buildings but these will only be considered as qualifying permanent improvements if they are associated with permanent structures. A mobile home is considered a qualifying permanent improvement only if it meets the following criteria: comprises at least 500 square feet; has been purchased new within the last five years; has approved water and sewer system connections; is properly blocked, skirted, and insulated; and is located on an individual lot which is owned by the Co-op Member. Mobile homes located on rented or leased space are considered temporary.

If the site improvements are sufficient to warrant construction of an electric service connection, KEA will complete the following initial installation to serve the new Co-op Member: a single distribution span; one pole; and one electric service drop (or equivalent). For service extensions that require facilities in excess of the average service, Co-op Members must execute a Line Extension Agreement with KEA and are required to pay a cash advance for any construction exceeding initial installation. Also, Co-op Members may be required to execute a service contract with KEA guaranteeing a minimum monthly payment to KEA.

If the site improvements are insufficient to warrant construction of an electric service connection, a service can still be installed if the Co-op Member posts a refundable cash deposit or provides evidence that financing is available to construct permanent improvements on the site in the immediate future. This financing must be arranged through a qualified lending institution. If a refundable cash deposit is received by KEA then the deposit will be returned to the Co-op Member if all of the following conditions are met: the Co-op Member has made a written request to KEA for the return of the deposit; qualifying permanent improvements have been constructed on the site within five years of the electric service hookup; and the Co-op Member has met payment requirements.

During KEA's visit to the property, KEA personnel will also specify the point at which the electric service will be connected to the Co-op Member's premises. The Co-op Member will ultimately be responsible for locating any required service entrance equipment precisely at the point and orientation specified by KEA.

Easements

In order to provide electric service to a Co-op Member, KEA must utilize or acquire an easement and/or a permit which grants KEA the legal right to construct, operate, and maintain electrical facilities on and across public or private property. Most subdivisions provide platted public utility easements along lot lines and KEA utilizes these easements when possible. If, however, there are no suitable easements on the property to be served, KEA must acquire a specific easement from the legal property owner. Specifically, the Co-op Member must, at no charge to KEA, grant a suitable easement for KEA on and across the property before any design engineering or construction will begin. The easement shall allow for construction of KEA's facilities on the property and provide access for future line extensions to adjoining properties. In addition, it is the owner's responsibility to provide suitable property corners, installed by a registered land surveyor, prior to any design work.

On occasion, easements may be required from adjoining property owners. KEA will make every reasonable attempt to acquire easements on and across property owned by third parties. However, if there are significant costs involved in acquiring such easements or in extending power lines across these properties, such costs must be borne by the Co-op Member requesting the work. Third party property owners who are reluctant to grant such easements should consider the fact that KEA power lines pass over many other properties in order to provide service to them. Residents should grant such easements in the best interest of the community.

In addition to securing easements as needed, the Co-op Member is responsible for providing and maintaining a minimum four foot clearing for overhead service drop conductors between the transformer pole or yard pole and the meter. This path must always be kept clear of buildings and debris.

Payments of Deposits and Fees

KEA requires that new Co-op Members pay a standard co-op membership fee as well as a meter account deposit. The amount of the meter deposit will vary depending upon credit considerations, estimated electrical consumption, and whether the premises to be served are residential, commercial, or industrial. The meter account deposit is refunded when the Co-op Member cancels membership.

Tasks Required Prior to Final Connection

The Job Order is sent to KEA's engineering personnel for design if:

- Power line extension criteria have been satisfied.
- Suitable easements have been secured.
- Deposits and fees have been paid.
- The job is complex enough to warrant design work.

Before KEA can complete a design for multi-residential, commercial, or industrial sites, the Co-op Member must first submit detailed electrical load data and electrical drawings to KEA. KEA requires that this information be prepared by a registered electrical engineer or licensed electrical contractor. Such data and drawings are not required for single-residential premises. Once KEA has completed a design, it will be field-staked by KEA.

Also during this stage, the Co-op Member should complete the installation of the service entrance equipment at the point where the electric service will be connected to the premises as previously specified by KEA. It is in the Co-op Member's best interest to complete all of these requirements as soon as possible.

When all of the above tasks have been completed, the site will be ready for a service entrance equipment inspection. KEA personnel will inspect the outside of the premises. Once the site inspection has been passed, KEA will schedule the construction and perform the required work.

TYPES OF ELECTRIC SERVICE

Temporary Service

KEA defines a permanent service to be an electric service that will continue undiminished beyond five years. Installations with a shorter predicted life are considered temporary. KEA facilities constructed where no satisfactory easement exists are also considered to be temporary.

KEA will provide temporary service if the Co-op Member bears all costs of installation and removal. KEA will allow temporary service for a maximum of twelve months. At the end of twelve months, the Co-op Member's permanent service entrance equipment must be installed if the Co-op Member wishes to continue receiving electricity. Temporary services left energized indefinitely tend to degenerate into inadequate and hazardous installations. Temporary services shall not be used to energize permanent wiring. KEA will terminate temporary service after 12 months or if permanent wiring is energized from a temporary service.

Construction Service

During the construction phase of many projects, builders need electricity to operate power tools and miscellaneous construction equipment. KEA will provide such construction service from existing facilities by installing a service drop to an approved construction power service entrance erected by the Co-op Member. KEA administers construction services in the same manner as temporary services.

Residential Service and Service to New Residential Subdivisions

KEA provides permanent residential service to individual houses, apartments, or garages. This is KEA's most popular service.

For new subdivisions, as soon as a Subdivider has established a preliminary plan for a proposed development, it is recommended that the Subdivider review the plan with KEA to discuss future power requirements. The Subdivider and KEA should determine the layout of the plat's power line easements. This discussion should be done while the design is still flexible and prior to preliminary plat approval by the City of Kotzebue. KEA will review the proposed plat once again when it is received from the City of Kotzebue with a request for official review and comment. If required, KEA will recommend final changes on easement location, wording, etc. and issue a letter of non-objection to the City of Kotzebue.

Underground Secondary Service

The KEA tariff does not include a contribution from the Co-op for underground service. Therefore, although two types of underground secondary service are available, they are not ordinarily allowed:

- Underground service connection from KEA's existing underground distribution system
- Underground service connection from a KEA overhead distribution facility

At a minimum, KEA will do a couple of tasks associated with the connection of an underground secondary service. These tasks include attaching the line to one of KEA's transformers and installing a meter. Additionally, at the Co-op Member's request, KEA will perform a complete installation of the underground secondary service if the Co-op Member bears all costs of installation. If the Co-op Member chooses to do the installation instead, a licensed electrical contractor must perform the work. The contractor might be required to follow special installation procedures.

In addition to being responsible for furnishing and installing the underground secondary service, the Co-op member is responsible for owning, operating, maintaining, and ultimately removing the underground service in accordance with KEA requirements.

There are also connection deadlines associated with underground secondary services. Underground services not connected between June 1st and September 15th will require special approval by KEA. Also, the Co-op Member must bear all additional costs incurred in doing a connection outside of this period.

Multi-Residential, Commercial, and Industrial Services

Multi-residential, commercial, and industrial electric service loads are expensive to serve and involve complex electrical requirements. The anticipated loads, electrical equipment, and administrative details must all be worked out in advance.

For these electric services, KEA requires detailed electrical load data and electrical drawings prepared by a registered electrical engineer or licensed electrical contractor. KEA will not start design work until these documents are received and reviewed by KEA. In addition, KEA will not start design work until the Co-op Member or authorized agent and KEA have thoroughly discussed relevant issues pertaining to the project including rates, metering, billing minimums, facility ownership, etc. The Co-op Member should be aware that Alaska Statutes require a licensed electrical contractor to perform the electrical work in all commercial buildings.

KEA's normal maximum secondary voltage aerial service drop conductor size is 4/0 AWG aluminum. Co-op Members with loads requiring larger service conductors must own, install, and maintain the required service wires at their own expense.

KEA's normal maximum pole-hung transformer sizes are 50-kVA single-phase and 150 kVA three-phase. Where a larger transformer is required, KEA will decide whether to pad-mount it at the base of the pole or to install a special overhead structure. KEA will normally provide and install up to 100 kVA single-phase and 150-kVA three-phase pole-mounted transformer. Pad-mount transformers up to 250 kVA single-phase or 500 kVA three-phase may be provided and installed by KEA upon individual approval; however, a long lead-time is necessary for ordering these transformers. Larger loads will be served only at primary voltage if the Co-op Member provides and installs the required primary disconnect, primary cable, pad, transformers, etc. at the Co-op Member's expense.

The starting and running characteristics of all motors 10 hp and larger must be approved by KEA prior to ordering or installing equipment. Contact KEA for additional details.

KEA may require that the Co-op Member install power factor correction equipment or other equipment necessary to correct deficiencies or electrical disturbances caused by the customer's equipment or loads.

Commercial and industrial rates include "demand billing" where monthly rate minimums are based on the electrical capacity required. The Co-op Member's engineer or contractor should seriously consider installing demand-limiting equipment to help to keep charges down.

Three-Phase Service

Three-phase service is available in a limited portion of KEA's Service Area. If a Co-op Member anticipates the need

for a three-phase service, the Co-op Member should discuss the situation with KEA before any equipment is purchased or installed. The situation must genuinely require a three-phase service before it will be installed.

If the Co-op Member's situation requires a three-phase service but the anticipated load is not projected to be economical for KEA, then the Co-op Member must bear all costs of installation.

If three-phase service is unavailable or not economically justifiable, the Co-op Member should install single-phase equipment or special equipment that permits operation of three-phase equipment from a single-phase power line. KEA requires that this special equipment be four-wire equipment (grounded-type).

METERING, DISCONNECT DEVICES, CONDUCTORS AND WIRE TYPE

Metering

KEA is responsible for locating, furnishing, installing, operating, and removing primary and secondary voltage meters. In addition, KEA is responsible for specifying the proper meter bases to be installed. On installations involving multiple meters, KEA will designate the location where the multiple meters are to be grouped.

The Co-op Member is responsible for furnishing and installing the meter base and service disconnect device. For residential service, pre-assembled meter bases are readily available in 100-Amp and 200-Amp capacities. Multi-residential, commercial, and industrial metering assemblies are usually fabricated specifically for the job and require special installation and metering. The Co-op Member is responsible for furnishing: the KEA-approved, revenue class, current transformers; an approved current transformer cabinet; meter socket; metering test switches; and installation of the current transformers.

Additional metering requirements include the following:

- In an emergency such as a fire, it is often necessary to de-energize the building wiring from outside the building. *All metering service equipment, conduits, and disconnect devices shall be grouped together and located on the exterior of the structure being served.*
- Wiring exposed to outdoor temperatures must have a type of insulation, as determined by KEA, that will not shatter when low temperatures are encountered. Insulation type XHHW is preferred. Type RHW is acceptable.
- The neutral conductor cannot be less than two trade sizes smaller than the ungrounded conductors when permitted by National Electrical Code.
- The metering enclosure, service equipment, and raceways shall be designed so that they can be properly sealed.
- KEA requires that meter-retaining rings have screw-type fasteners.
- All openings shall be closed with covers that cannot be removed from the outside without first removing the seal.

Refer to drawings for grounding requirements. Drawing 11 illustrates the grounding required by KEA for multiple metered services without a main disconnect. Drawing 12 illustrates the grounding required by KEA for Current Transformer (CT) metered services.

Emergency Generator Installations

Consumers having emergency power systems must meet all provisions of Articles 700, 701, and 702 of the National Electrical Code. In addition, KEA requires the emergency power system to be connected after the *main service disconnecting and over-current protection means*.

Service Disconnect Device Size

The minimum service entrance disconnect device size for a single-family residence is 100-Amps. The service entrance disconnect device size for multi-residential, commercial, and industrial services will be sized according to submitted and approved load data calculations.

Residential Service Conductor Size and Type

The minimum conductor size must be rated for full ampacity of the service main disconnect unless a smaller wire size is permitted by KEA based on submitted and approved load data calculations.

Residential Service Ampacities:

<u>Service Size</u>	<u>Minimum Wire Size</u>	<u>Wire Type</u>
100 Amp	#3 Copper	XHHW or RHW
110 Amp	#2 Copper	XHHW or RHW
125 Amp	#1 Copper	XHHW or RHW
150 Amp	1/0 Copper	XHHW or RHW
175 Amp	2/0 Copper	XHHW or RHW
200 Amp	3/0 Copper	XHHW or RHW

NATIONAL ELECTRICAL CODE AND ELECTRICAL INSPECTION

KEA has adopted the National Electrical Code (NEC) as the minimum standard acceptable for the electrical installations that KEA serves. The National Fire Protection Association produces the current National Electrical Code books. The National Electrical Code is not a handbook that shows how to complete wiring installations. Instead, it is a set of explicit minimum specifications regarding the use of electrical wiring and devices. Homebuilders who plan to "do it yourself" should supplement their copy of the National Electrical Code with a wiring installation handbook.

KEA requires that the Co-op Member's service equipment be installed by a licensed electrician and inspected for compliance with the National Electrical Code and KEA's Electric Service Requirements. Service equipment for secondary voltage metered installations will be inspected from the point of attachment of the utility's service through the meter socket and/or instrument transformer section to and including the voltage main disconnecting means located immediately on the Co-op Member's side of the metering. Any equipment electrically connected to and adjacent to the service equipment and obvious to the inspector is also subject to inspection. The Co-op Member should be aware that KEA might impose more stringent requirements than regulatory bodies having jurisdiction.

Should any existing service or proposed service be deemed unsafe, inadequate, or injurious to the operation of KEA's system, the service may be terminated or withheld until defects are corrected and the installation is approved.

SPECIAL NOTES: GROUNDING, FAULT CURRENT, & INTERRUPTING RATINGS

A second ground rod must be installed for any service where a single ground rod does not have a ground resistance of 25 ohms or less (See National Electrical Code, Sec. 250.56). Prior to installing a custom meter, the ground rod resistance will be tested by KEA personnel. If a second ground rod is required, the Co-op Member requesting the service will be so informed. The second ground rod shall be installed as per NEC Sec. 250.56 and shall be spaced at least six feet from the first ground rod.

All service equipment over-current devices must be capable of interrupting the maximum fault current available at the service (See National Electrical Code, Sec. 110-9).

All service over-current devices installed on KEA systems must have a minimum interrupting rating of 10,000-Amps. Higher interrupting rating is required where the available fault current exceeds 10,000-Amps.

MINIMIZE DELAYS

Avoid these common mistakes when installing electric service entrance equipment:

1. The entrance service equipment is placed in a location other than that specified by KEA.
2. The guying of service equipment is improperly done (see Drawing 10).
3. The ground wire is not the proper size or it is improperly connected at the service entrance equipment (see Drawings 1 and 2).
4. The grounding electrode system is improperly installed or is insufficient to meet National Electrical Code requirements. Ground rods must be copper-coated steel, driven close to grade, and left available for inspection (see Drawings 1 and 2).
5. The service entrance conductors are not the proper size or have the wrong insulation type or material (refer to various diagrams). Note that service entrance conductors must be copper on overhead service connections.
6. The path for the service drop is not cleared to the proper width or the path is not cleared of items.
7. The mast on the service equipment that is mounted on the eave side of a single story building does not meet the minimum 2" size, is not extended through the eave, or is improperly guyed.
8. Multi-meter installations are not properly identified with approved permanent numbers on the service entrance equipment. Note that if the Co-op Member has more than one meter on the building, each meter must be identified with its associated apartment.
9. For meter pole installations:
 - Pole is not fully pressured-treated or approved.
 - Pole is not buried to proper depth.
 - Pole is not sufficient height to meet clearance requirements.
 - Pole is improperly guyed or is anchored with unapproved equipment.
 - Ground wire is not stapled to pole.
 - Service equipment is not mounted on proper brackets.
 - Meter is not mounted to face in the direction as specified by KEA.

Please double-check the above problem areas before calling KEA for your service entrance inspection.

POWER THEFT PREVENTION PROGRAM

For the protection of all of its Co-op Members, KEA maintains an active power theft detection and prevention program. For security reasons, KEA personnel will periodically check the Co-op Member's electric service.

KEA's tariff provides that the Co-op Member shall not in any way interfere with or alter the meters, seals, or other property used in connection with rendering electric service, or permit the same to be done by others except authorized agents or employees of KEA. Damage to or interference with this equipment may result in service disconnection and the requirement that the Co-op Member pay all damages, fines, and bills for metered or un-metered electricity. Damage amounts may be tripled according to Alaska Statutes.

Please report any tampering with utility equipment to KEA.

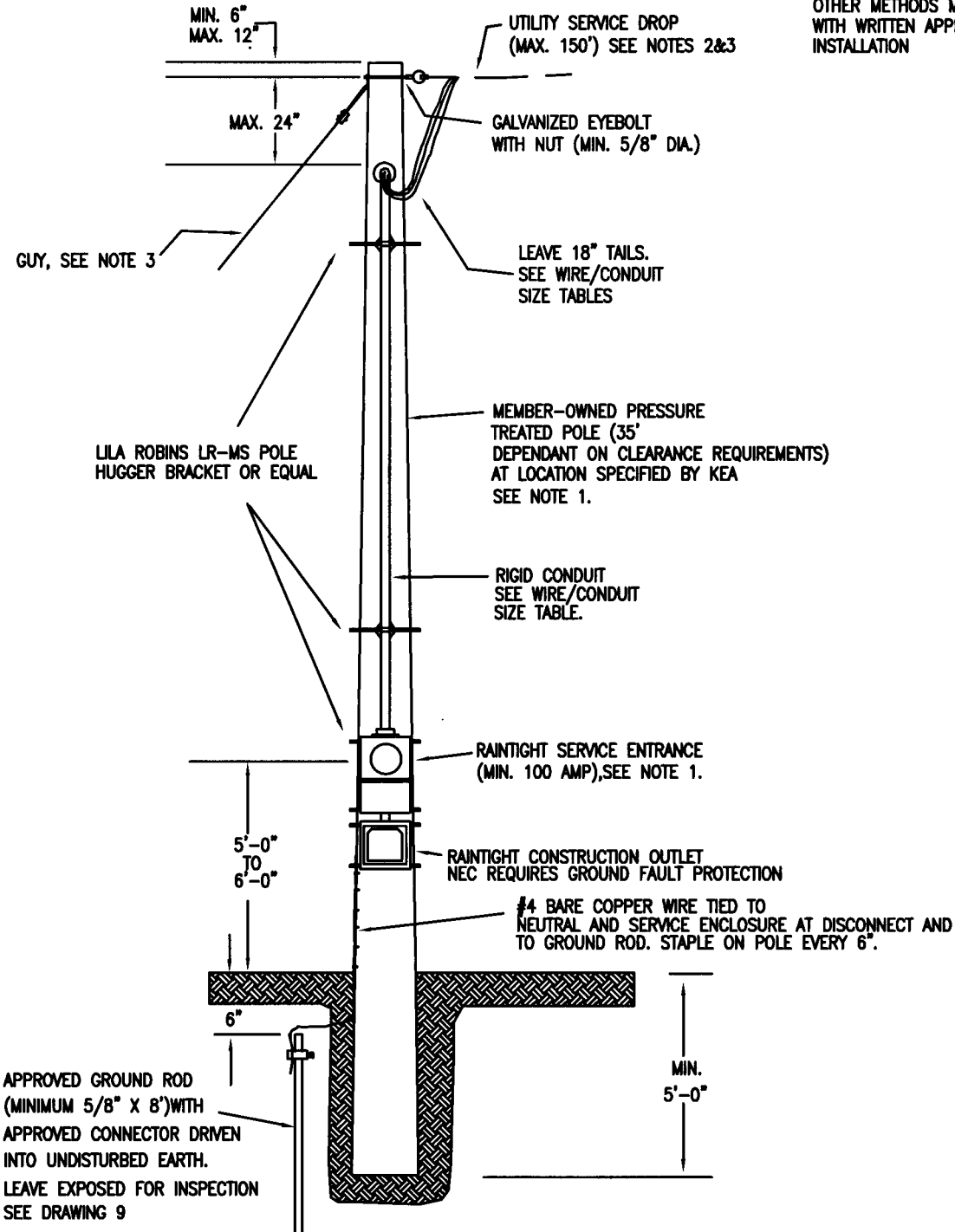
LIST OF DRAWINGS

<u>Drawing</u>	<u>Page</u>	<u>Drawing Title</u>
1	12	Minimum Residential Construction Service - Overhead
2	13	Construction Service from KEA Underground System
3	14	Permanent Overhead Service on House
4	15	Permanent Residential Service from KEA Underground System
5	16	Permanent Underground Residential Service - Meter on Member's Pole
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TO OUR VALUED CUSTOMERS

*We hope this booklet answers your questions regarding electrical service connections.
If you need further assistance, please contact KEA.*

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION



NOTES

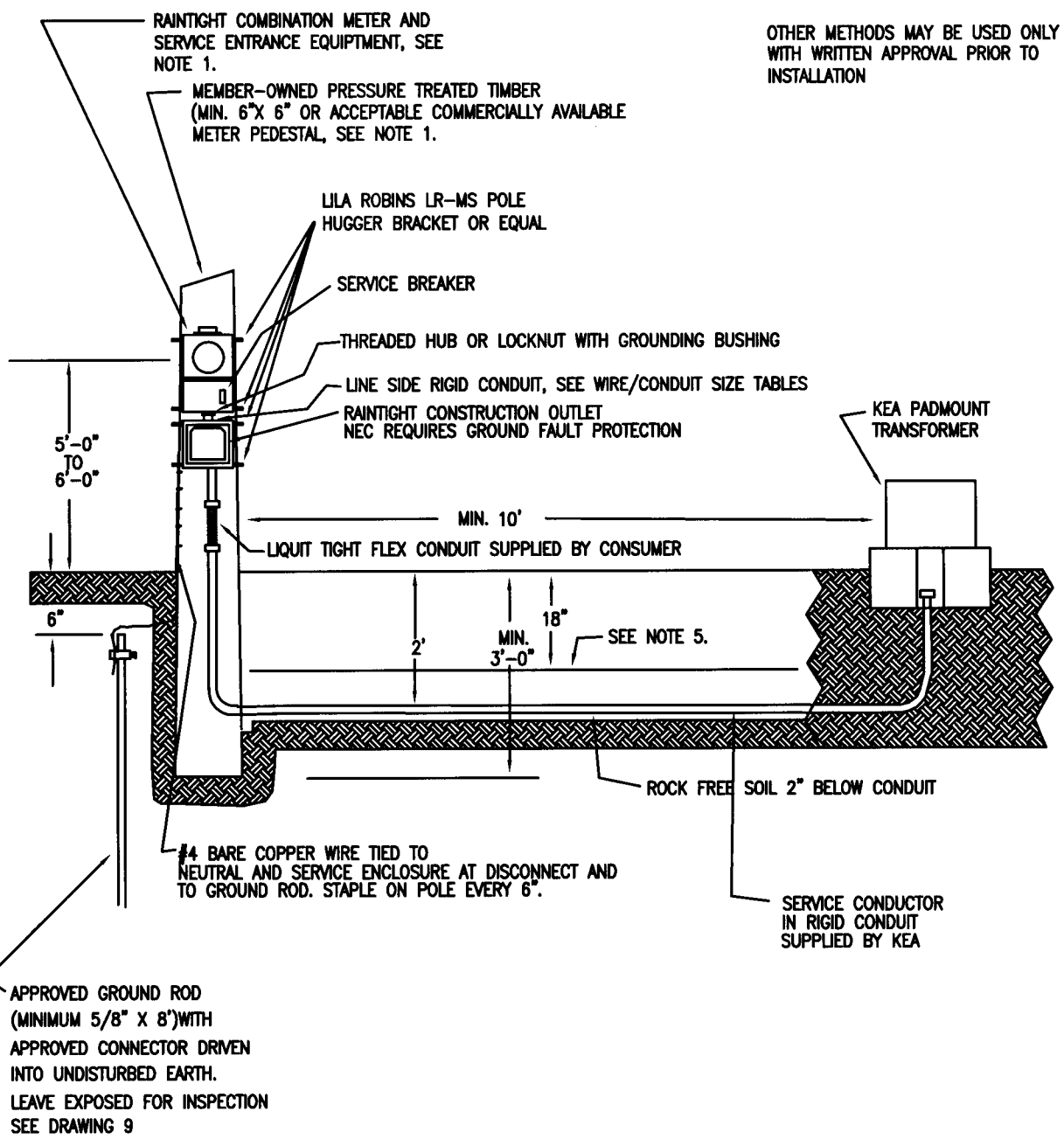
1. Service Pole location and direction meter socket faces will be specified in writing by KEA.
2. Member must provide and maintain a minimum 4 foot wide clearing for service drop wires between service entrance and KEA pole.
3. If service drop exceeds 50', pole must be guyed. Service drop shall not exceed 150'. See guying details on Drawing 10.

Not to be used for energizing permanent wiring systems. Construction service approved for construction power only. Service will be disconnected 12 months after connect or if permanent wiring is energized.

WIRE/CONDUIT SIZE TABLE		
WIRE MUST BE COPPER		
MINIMUM SERVICE SIZE	MINIMUM WIRE SIZE	MINIMUM CONDUIT SIZE
60Amp	6 Copper	1"

MINIMUM RESIDENTIAL CONSTRUCTION SERVICE – OVERHEAD

DRAWING 1



OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION

NOTES

1. Service Pole location and direction meter socket faces will be specified in writing by KEA.
2. Tie continuous ground wire to neutral and service enclosure at disconnect, then ground to minimum 5/8" X 8" approved ground rod. Attach with approved grounding connector.
3. KEA specifies copper wire.
4. Trench must be dug to proper depth between meter pedestal and edge of transformer pad. Hand dig when within 5' of transformer pad. Installation must pass KEA inspection prior to backfill. Back-fill must be rock free.
5. Approved market tape to be installed 5" above cable.
6. Member shall install a second ground rod if required by NEC Section 250-50 and 250-52.

* CAUTION! See special note about available fault current on Page 9.

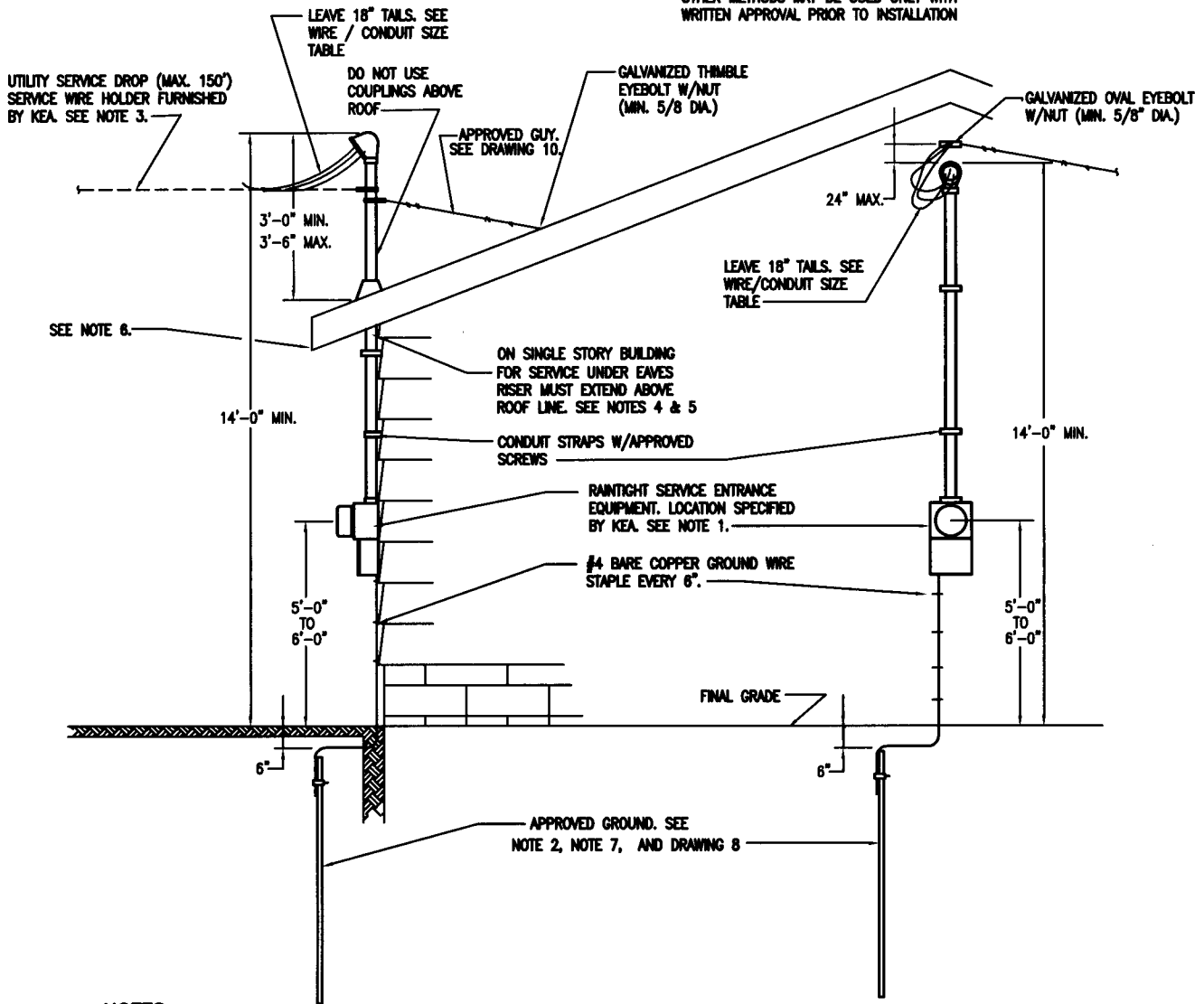
Not to be used for energizing permanent wiring systems. Construction service approved for construction power only. Service will be disconnected 12 months after connect or if permanent wiring is energized.

WIRE/CONDUIT SIZE TABLE			
For Wire from Transformer to Meter			
WIRE MUST BE COPPER			
MINIMUM SERVICE SIZE	MINIMUM WIRE SIZE	MINIMUM CONDUIT SIZE	MINIMUM GROUND SIZE
100 Amp	3 Copper	1 1/4"	4 Copper

CONSTRUCTION SERVICE FROM KEA UNDERGROUND SYSTEM

DRAWING 2

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION



NOTES

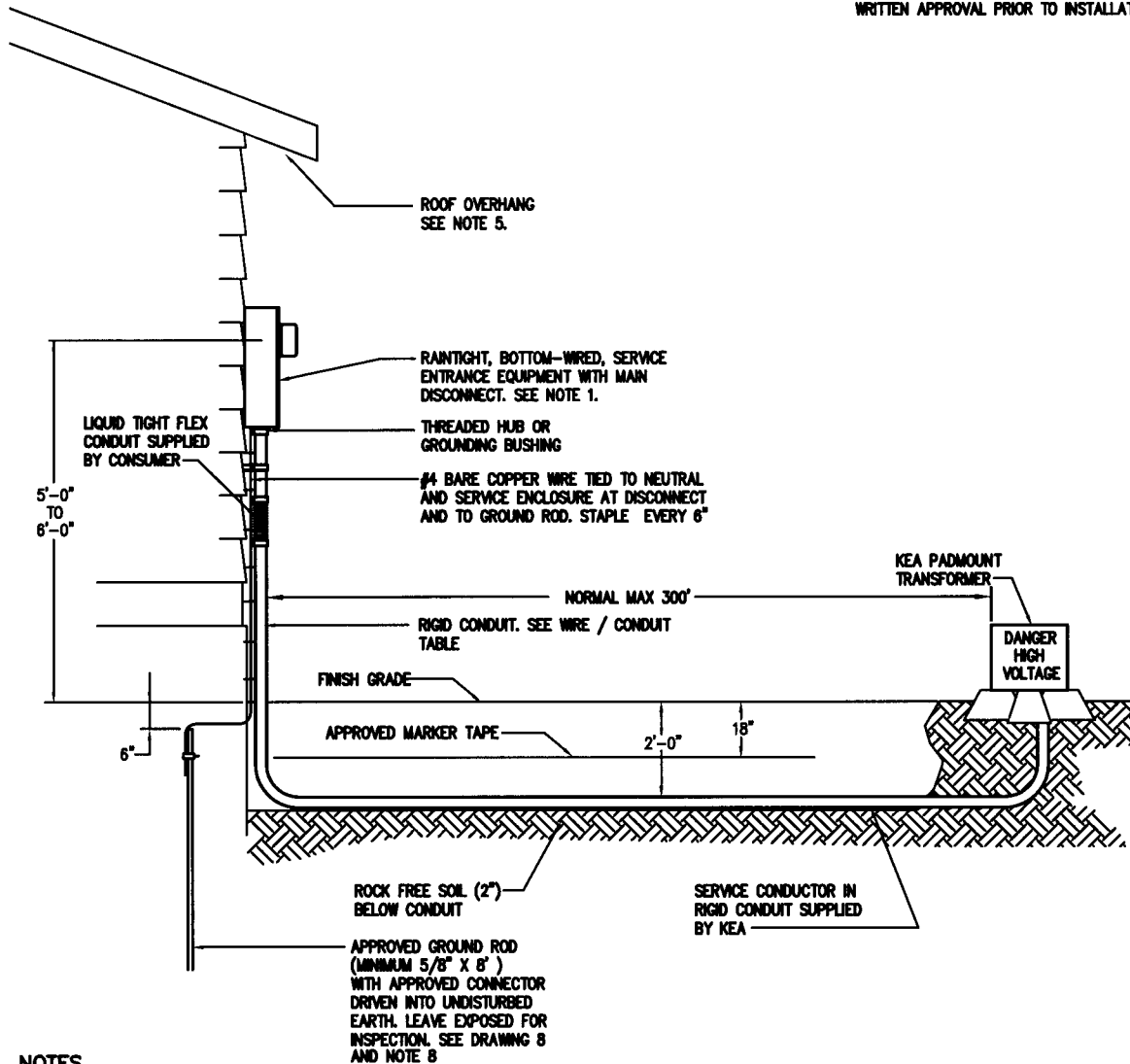
1. Service location and direction meter socket faces will be specified in writing by KEA.
2. Tie continuous ground wire to neutral and service enclosure at disconnect, then ground to minimum 5/8" X 8' approved ground rod. Attach with approved grounding connector.
3. Member must provide and maintain a minimum 4 foot wide clearing for service drop wires between service entrance and KEA pole.
4. Conductors must be above or a least 36" from any building openings.
5. All service entrance masts that extend above the roof line must be a minimum 2" rigid conduit or IMC and must be guyed using minimum 1/8" aircraft cable and approved clamp. See guying details, Drawing 10.
6. If roof overhang is less than 2 feet, provide suitable protection from ice and snow. Protection by overhanging roof is preferred. An acceptable alternative is a protective hood made of minimum 18 gauge galvanized steel extending 6" out from face of meter and 6" on each side of the service equipment.
7. Member shall install a second ground rod if required by NEC Section 250-50 and 250-52.

WIRE/CONDUIT SIZE TABLE			
WIRE MUST BE COPPER			
SERVICE SIZE	MINIMUM WIRE SIZE	MINIMUM CONDUIT SIZE	MINIMUM GROUND SIZE
100 Amp	3 Copper	1 1/4"	4 Copper
200 Amp	3/0 Copper	2"	4 Copper

PERMANENT OVERHEAD SERVICE ON HOUSE

DRAWING 3

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION

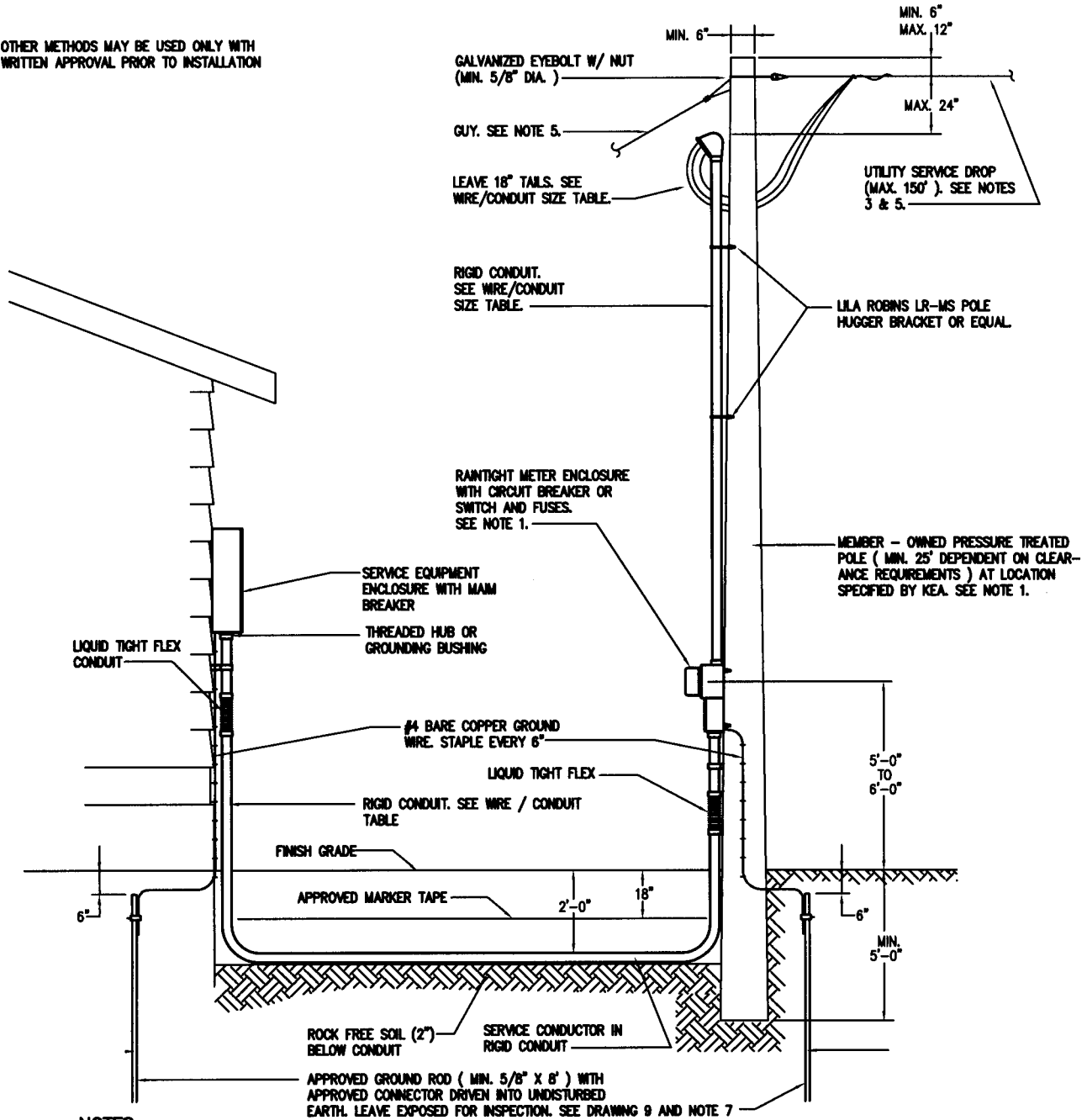


NOTES

1. Service location and direction meter socket faces will be specified in writing by KEA.
2. Tie continuous ground wire to neutral and service enclosure at disconnect, then ground to minimum 5/8" X 8' approved ground rod. Attach with approved grounding connector.
3. Contact KEA to determine wire size required to assure proper voltage at house.
4. Trench must be dug to proper depth between house and transformer pad. Hand dig when within 5' of transformer. Installation must pass KEA inspection prior to backfill. Backfill material must be rock-free.
5. If roof overhang is less than 2 feet provide suitable protection from ice and snow. Protection by overhanging roof is preferred. An acceptable alternative is a protective hood made of minimum 18 gauge galvanized steel extending 6" out from face of meter and 6" on each side of the service equipment.
6. KEA specifies only copper wire.
7. NEC and NESC require a minimum 12" separation between power and communication cable.
8. Member shall install a second ground rod if required by NEC Section 250-50 and 250-52.

WIRE/CONDUIT SIZE TABLE For Wire from Transformer to Meter			
WIRE MUST BE COPPER			
SERVICE SIZE	MINIMUM WIRE SIZE	MINIMUM CONDUIT SIZE	MINIMUM GROUND SIZE
100 Amp	See note 5	Depends on wire size	4 Copper
200 Amp	See note 5	Depends on wire size	4 Copper

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION



NOTES

1. Service location and direction meter socket faces will be specified in writing by KEA.
2. Tie continuous ground wire to neutral and service enclosure at disconnect, then ground minimum 5/8" X 8" approved ground rod. Attach with approved grounding connector.
3. Member must provide and maintain a minimum 4 foot wide clearing between meter pole and KEA pole for service drop wires.
4. Soil below plank or marker tape must be rock-free and hand backfilled to avoid cable damage.
5. If service drop exceeds 50', pole must be guyed. See guying details, Drawing 10.
6. Wire size depends on length of run. Check with KEA. Load side conduit shall be properly sized for member's wire between service and house. KEA recommends use of copper wire between meter and house.

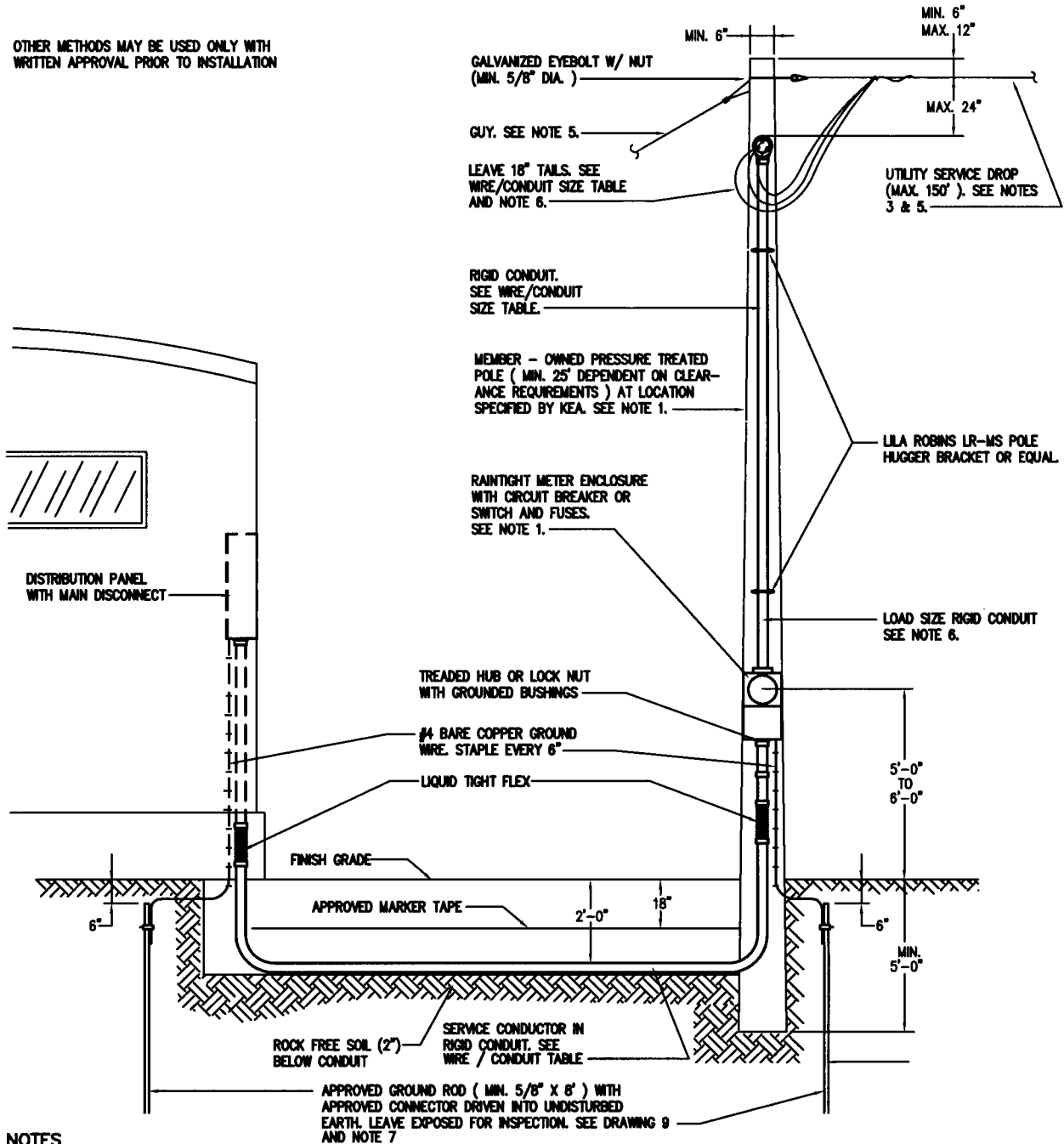
7. Member shall install a second ground rod if required by NEC Section 250-50 and 250-52.

WIRE/CONDUIT SIZE TABLE FOR SERVICE ENTRANCE MAST WIRE MUST BE COPPER			
SERVICE SIZE	MINIMUM WIRE SIZE	MINIMUM CONDUIT SIZE	MINIMUM GROUND SIZE
100 Amp	3 Copper	1 1/4"	4 Copper
200 Amp	3/0 Copper	2"	4 Copper

**PERMANENT UNDERGROUND RESIDENTIAL SERVICE
- METER ON MEMBER'S POLE**

DRAWING 5

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION



NOTES

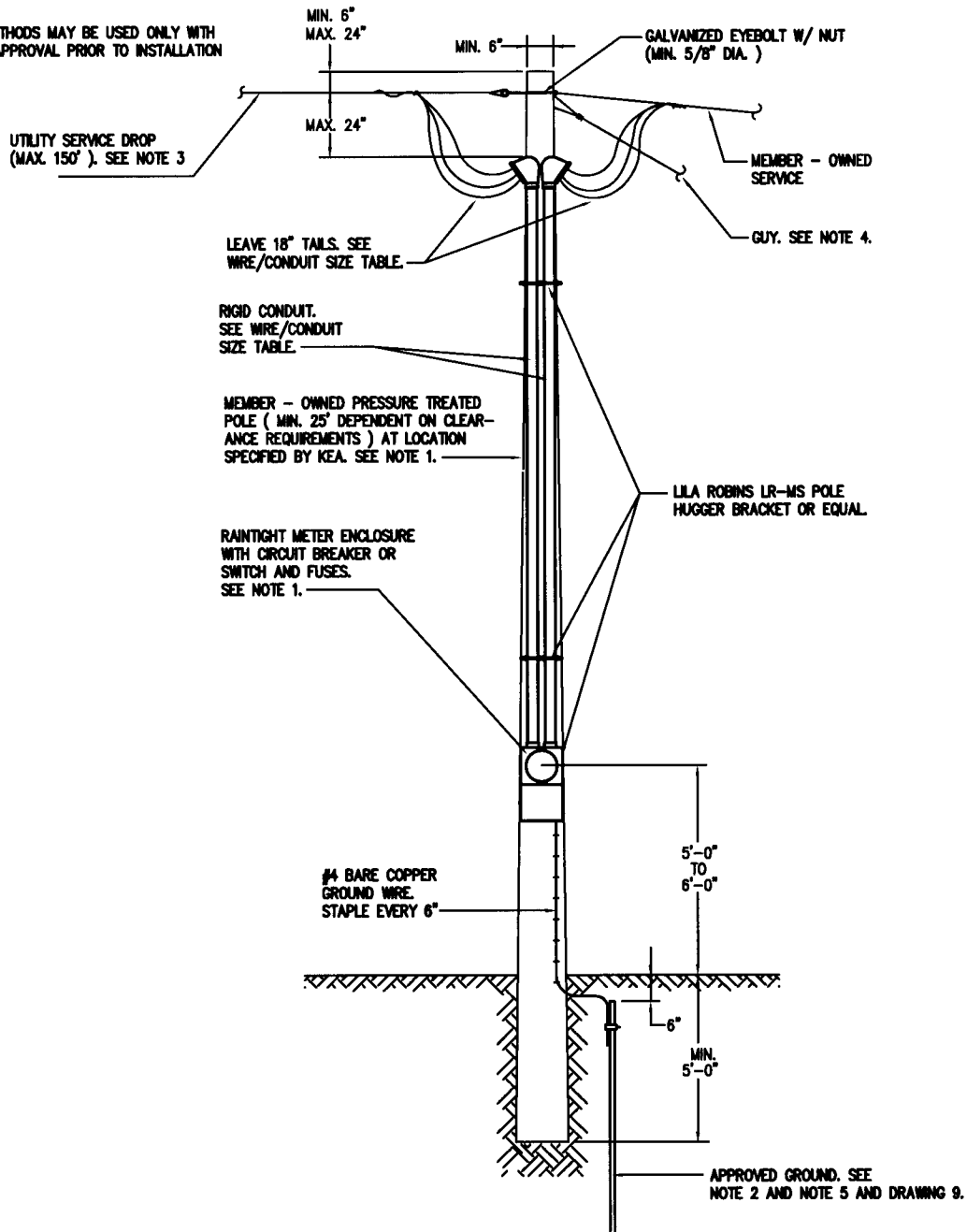
1. Service location and direction meter socket faces will be specified in writing by KEA.
2. Tie continuous ground wire to neutral and service enclosure at disconnect, then ground to minimum 5/8" X 8' approved ground rod. Attach with approved grounding connector.
3. Member must provide and maintain a minimum 4 foot wide clearing between meter pole and KEA pole for service drop wires.
4. Soil below marker tape must be rock-free and hand backfilled to avoid cable damage.
5. If service drop exceeds 50', pole must be guyed. See guying details, Drawing 10.
6. Wire size depends on load and length of run. Check with KEA. Load side conduit shall be properly sized for members wire between service and mobile home. KEA recommends use of copper wire between meter and mobile home.

7. Member shall install a second ground rod if required by NEC Section 250-50 and 250-52.

WIRE/CONDUIT SIZE TABLE FOR SERVICE ENTRANCE MAST WIRE MUST BE COPPER			
SERVICE SIZE	MINIMUM WIRE SIZE	MINIMUM CONDUIT SIZE	MINIMUM GROUND SIZE
100 Amp	3 Copper	1 1/4"	4 Copper
200 Amp	3/0 Copper	2"	4 Copper

MOBILE HOME UNDERGROUND SERVICE FROM OVERHEAD SYSTEM DRAWING 6

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION



NOTES

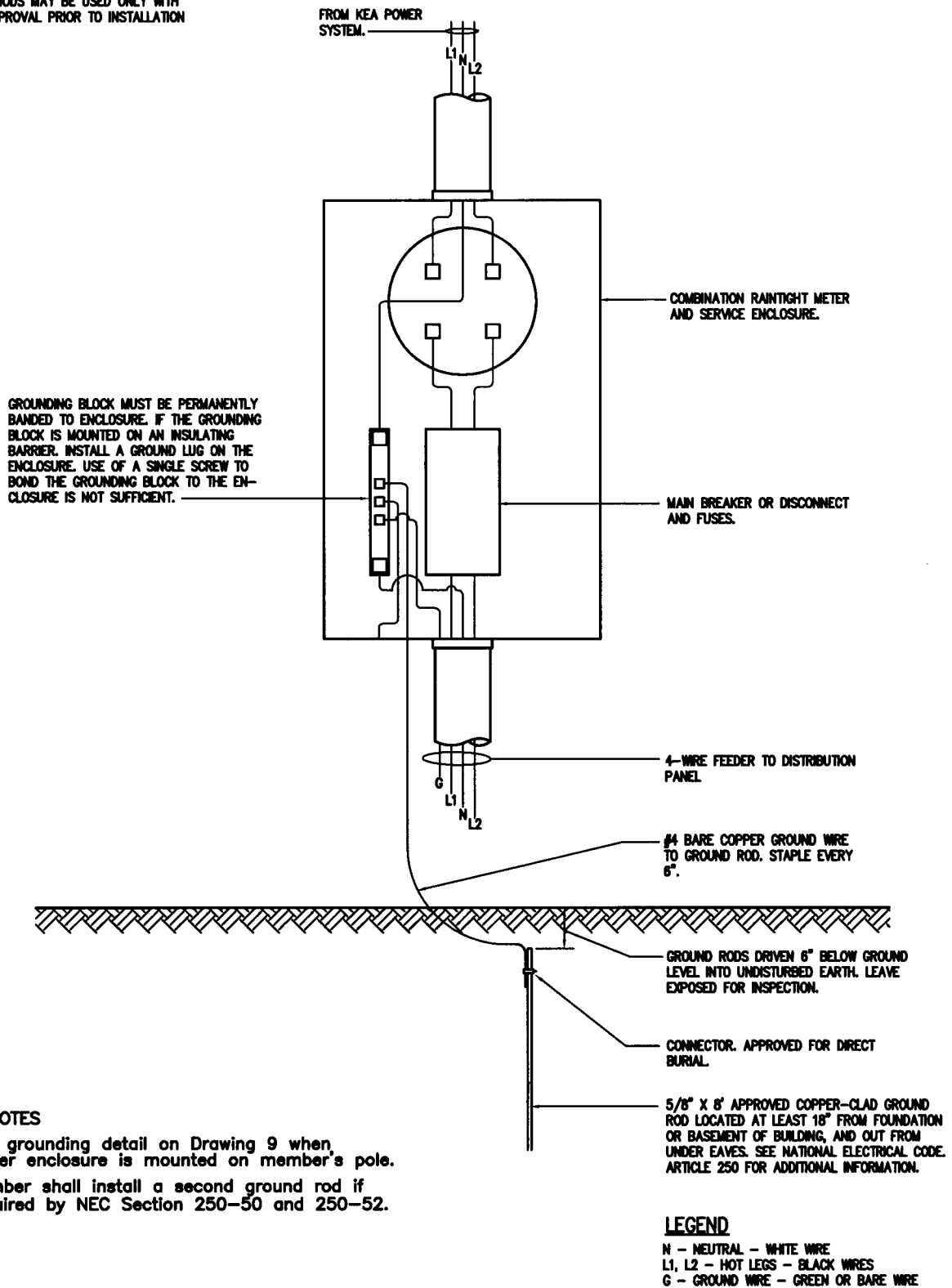
1. Service location and direction meter socket faces will be specified in writing by KEA.
2. Tie continuous ground wire to neutral and service enclosure at disconnect, then ground to minimum 5/8" X 8' approved ground rod. Attach with approved grounding connector.
3. Member must provide and maintain a minimum 4 foot wide clearing between meter pole and KEA pole for service drop wires.
4. If service drop exceeds 50', pole must be guyed. Service drop shall not exceed 150'. See guying details, Drawing 10.
5. Member shall install a second ground rod if required by NEC Section 250-50 and 250-52.

WIRE/CONDUIT SIZE TABLE			
WIRE MUST BE COPPER			
SERVICE SIZE	MINIMUM WIRE SIZE	MINIMUM CONDUIT SIZE	MINIMUM GROUND SIZE
100 Amp	3 Copper	1 1/4"	4 Copper
200 Amp	3/0 Copper	2"	4 Copper

OVERHEAD SERVICE FROM METER POLE

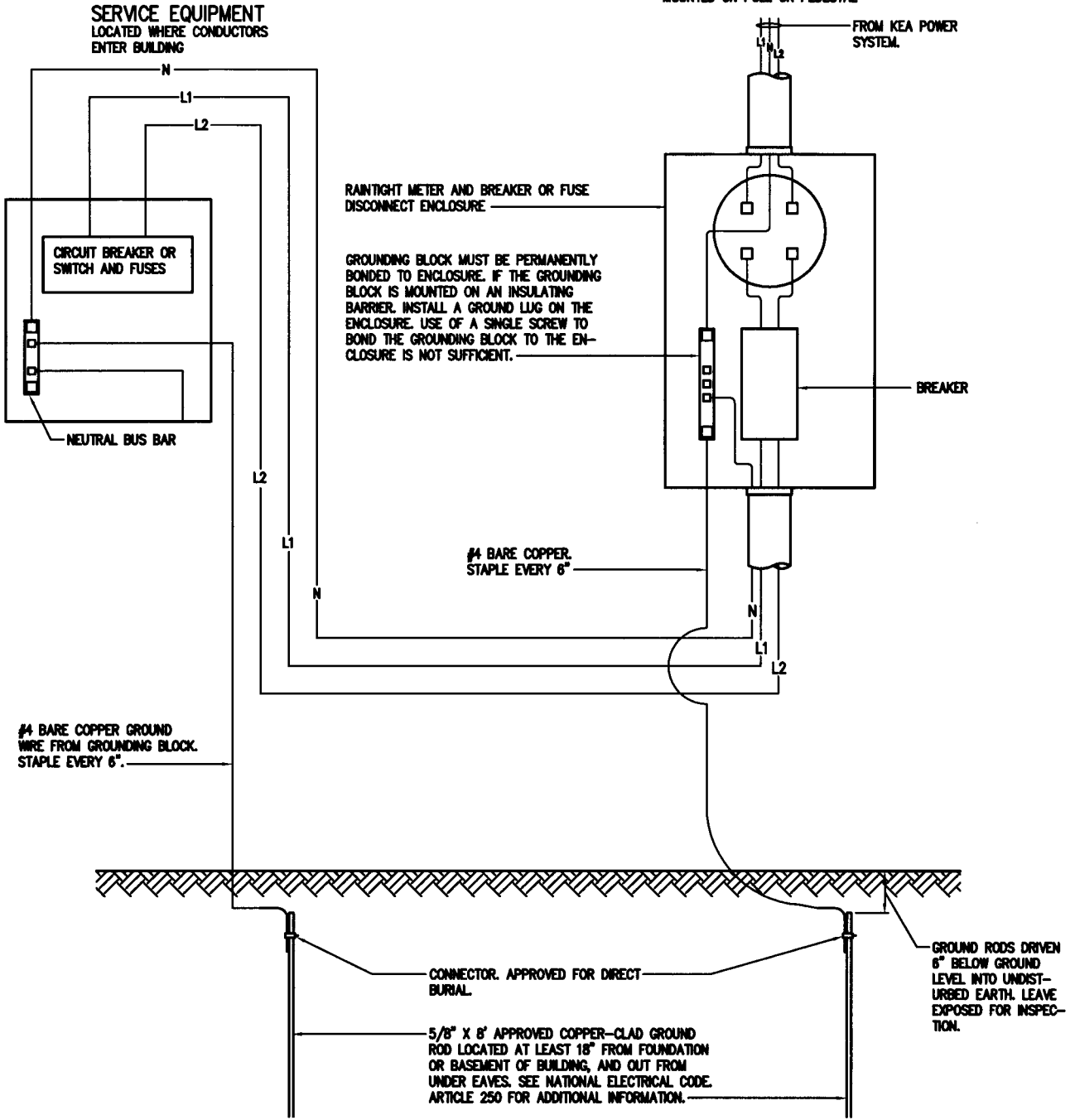
DRAWING 7

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION



GROUNDING DETAIL - METER LOCATED ON BUILDING BEING SERVED DRAWING 8

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION



NOTES

1. Use grounding detail on Drawing 8 when service is mounted on building being served.
2. Member shall install a second ground rod if required by NEC Section 250-50 and 250-52.

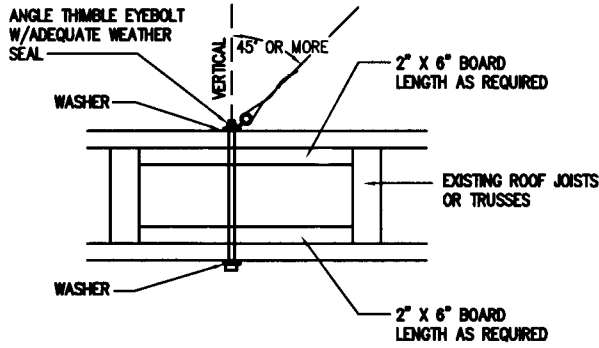
LEGEND

N - NEUTRAL - WHITE WIRE
 L1, L2 - HOT LEGS - BLACK WIRES

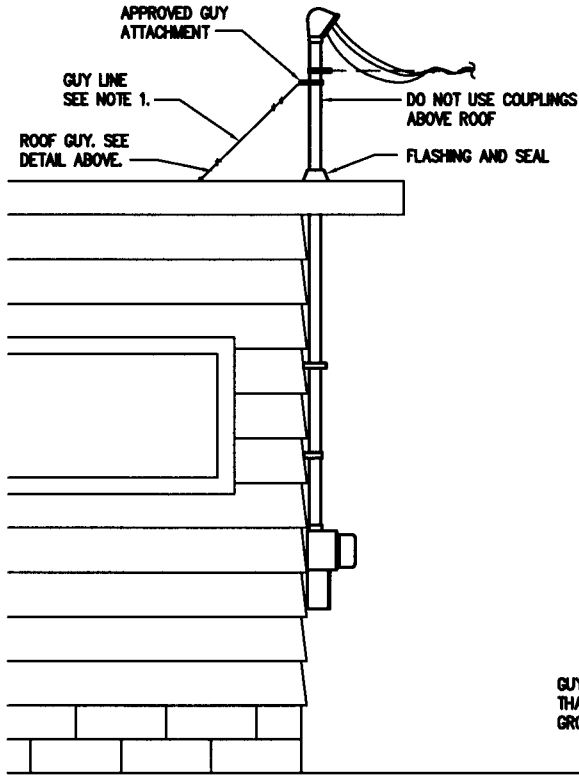
GROUNDING DETAIL - FOR POLE OR PEDESTAL MOUNTED METER **DRAWING 9**

OTHER METHODS MAY BE USED ONLY WITH WRITTEN APPROVAL PRIOR TO INSTALLATION

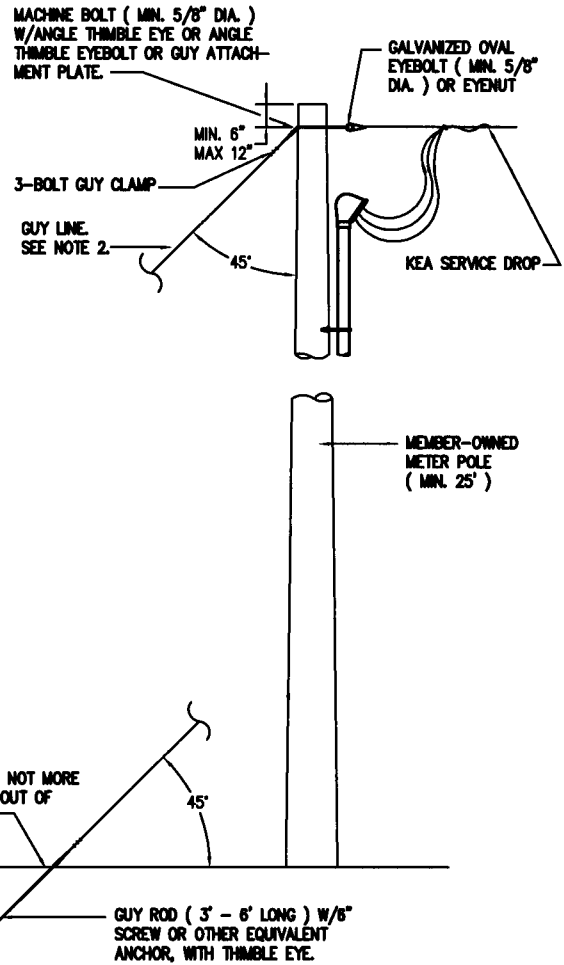
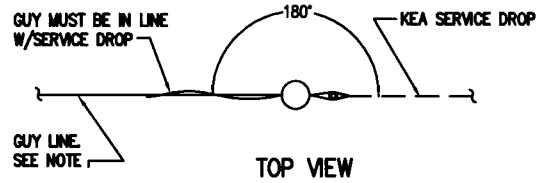
METER ON HOUSE



ROOF GUY DETAIL



METER ON POLE

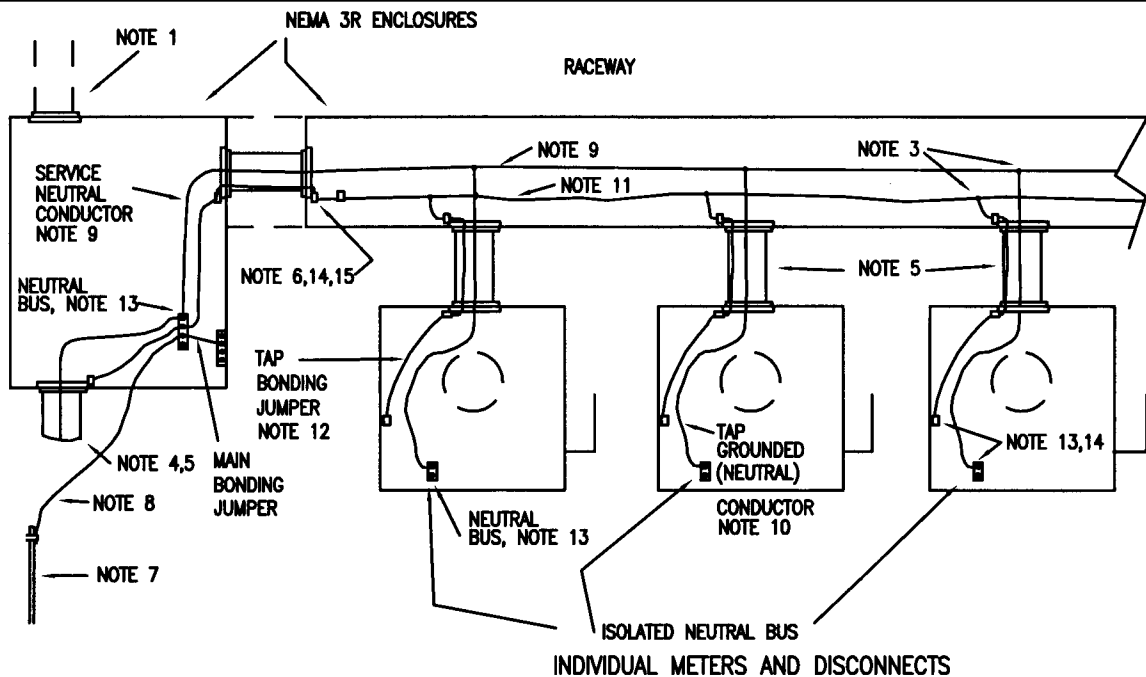


NOTES

1. All service conduit extending above the roof must be minimum 2" rigid conduit and must be guyed. Roof guy line must be minimum 1/8" stranded stainless steel wire (aircraft cable) with approved clamps.
2. If service drop exceeds 50' pole must be guyed. Service drop must not exceed 150'. Pole guy line must be minimum 1/4" stranded galvanized steel wire with approved clamps.

GUYING DETAILS

DRAWING 10

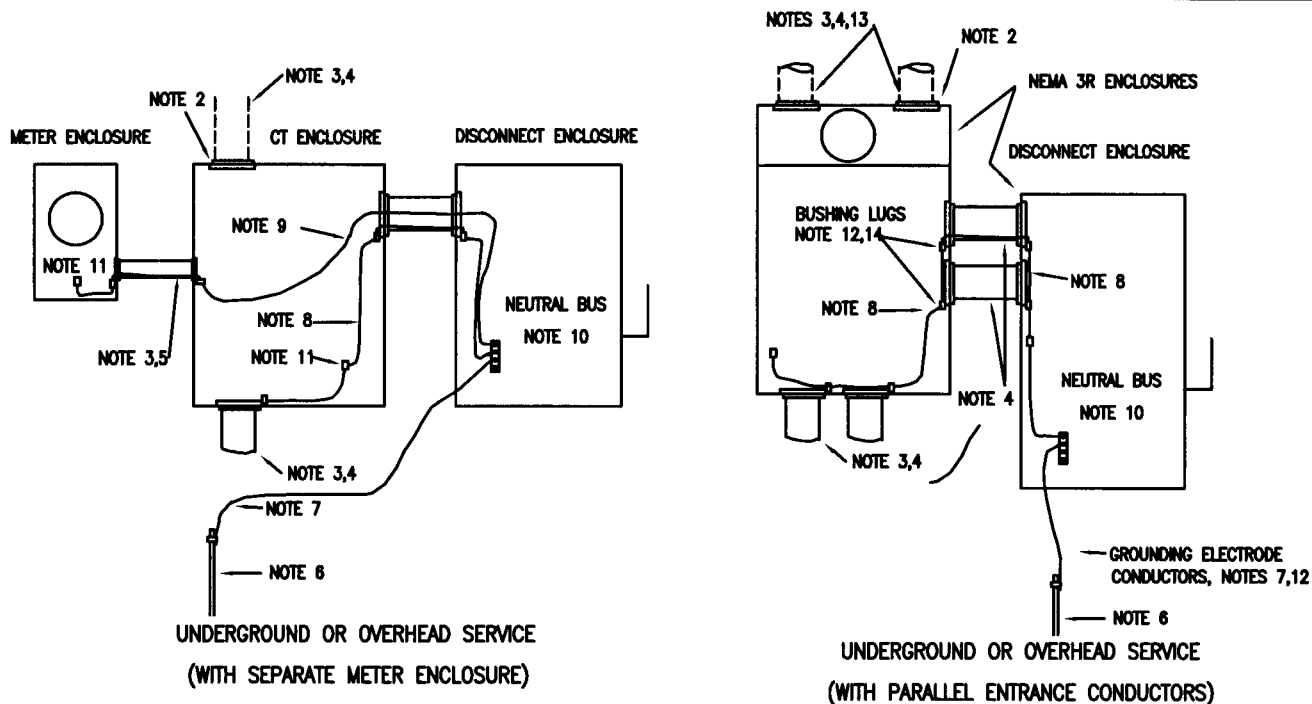


NOTES

1. All service enclosures shall be NEMA 3R or better outdoor type. Hubs exposed to weather must be rated weather tight.
2. All CT and meter enclosures must have hubs and hub covers not removable from exterior of can.
3. Compression or screw type connectors are acceptable means of splicing conductors. Split bolt type are not acceptable.
4. This conduit to be continuous. No junction boxes or conduit bodies are permitted.
5. These conduits shall be galvanized rigid conduit (GRC) or galvanized intermediate conduit and sized in accordance to NEC Table 1, Ch. 9.
6. Method of bonding service equipment shall be per NEC 250-90. Meyers type threaded hubs approved for bonding by a nationally recognized testing laboratory are acceptable for bonding conduit to enclosures and may be substituted for conduit bonding bushing. Standard locknuts or sealing locknuts are not acceptable for bonding at service equipment.
7. Refer to NEC 250-50 and 250-52 for approved types of grounding electrodes. If grounding requirements of NEC 250-50 cannot be met and made electrode are utilized as the sole type of grounding electrodes, then a minimum of 2 made electrodes will be required for services over 200 A. Electrodes may be directly bonded together with grounding electrode conductor or individually routed to the neutral bus as shown in Drawing 11.
8. Grounding electrode conductors sized in accordance with NEC 250-66 with minimum size to be #4 copper in accordance with KEA requirements. For specific service entrance, see approved KEA load data for minimum permissible grounding electrode conductor size.
9. Service neutral conductor sized in accordance to maximum diversified service demand and NEC 220-22 with minimum size to be #4 copper according to KEA requirements. Neutral conductor to be continuous from point of service entry though individual disconnect to neutral bus.
10. Tap grounding (neutral) conductor sized in accordance to individual diversified service demand and NEC 220-22 with minimum size to be #4 copper according to KEA requirements. Tap neutral conductor must be continuous from tap through individual disconnect to neutral bus.
11. Bonding conductor shall be sized in accordance to NEC 250-92(a) and 94 with minimum size to be #4 copper in accordance with KEA requirements. Bonding conductor to be continuous throughout service equipment with the exception of the individual disconnect taps.
12. Tap bonding jumper sized in accordance to NEC 250-102C and individual disconnect ungrounded conductor size with minimum size to be #4 copper according to KEA requirements.
13. All neutral buses to be either directly or indirectly effectively bonded to enclosures in accordance to NEC 250-26 and 250-28. Install separate grounding lug in enclosure if neutral bus is not directly bonded to enclosure. Factory supplied neutral bus bonding means is acceptable.
14. Per NEC 250-96, paint must be removed from surfaces in contact with grounding fittings. Exposed metal at ground points must be protected with conductive corrosion inhibitor.
15. When a grounding conductor is routed through a metallic conduit, both ends of the conduit must be bonded to said grounding conductor, according to NEC 250-64(e).
16. It is the customer's responsibility to phase mark paralleled conductors in an easily visible manner.
17. Where insulated taps are made on service conductors, KEA reserves the right to have the tap exposed for examination. The installer will reinsulate the tap before the service is energized.

REQUIRED GROUNDING FOR MULTIPLE METERED SERVICE WITHOUT MAIN DISCONNECT

DRAWING 11



NOTES

1. All service enclosures shall be NEMA 3R or better outdoor type. Hubs exposed to weather must be rated weather tight.
2. All CT and meter enclosures must have hubs and hub covers not removable from exterior of can.
3. This conduit to be continuous. No junction boxes or conduit bodies are permitted.
4. These conduits shall be galvanized rigid conduit (GRC) or galvanized intermediate conduit and sized in accordance to NEC Table 1, Ch. 9 or Appendix C Table C 8 (for GRC) and C4 (for intermediate metal conduit).
5. Minimum conduit size between CT and meter enclosures shall be: 3/4" if separation is less than 10'; 1 1/4" if separation is greater than 10'. Conduit to be galvanized rigid or galvanized intermediate.
6. Refer to NEC 250-50 and 250-52 for approved types of grounding electrodes. If grounding requirements of NEC 250-50 cannot be met and made electrodes are utilized as the sole type of grounding electrodes, then a minimum of 2 made electrodes will be required for services over 200 A. Electrodes may be directly bonded together with grounding electrode conductor or individually routed to the neutral bus as shown in Drawing 12.
7. Grounding electrode conductors sized in accordance with NEC 250-66 with minimum size to be #4 copper in accordance with KEA requirements. For specific service entrance, see approved KEA load data for minimum permissible grounding electrode conductor size.
8. Equipment bonding conductor sized in accordance to NEC 250-66 with minimum size to be #4 copper according to KEA requirements. Bonding conductor to be continuous throughout service equipment with the exception of the individual disconnect taps.
9. #4 copper conductor acceptable for bonding CT meter enclosure. This bonding conductor must be continuous between bonding points.
10. All neutral buses to be either directly or indirectly effectively bonded to enclosures in accordance to NEC 250-26 and 250-28. Install separate grounding lug in enclosure if neutral bus is not directly bonded to enclosure. Factory supplied neutral bus bonding means is acceptable.
11. Per NEC 250-96, paint must be removed from surfaces in contact with grounding fittings. Exposed metal at ground points must be protected with conductive corrosion inhibitor.
12. When a grounding conductor is routed through a metallic conduit, both ends of the conduit must be bonded to said grounding conductor according to NEC 250-64(e).
13. It is the customer's responsibility to phase mark paralleled conductors in an easily visible manner. High leg of delta services shall be identified ORANGE per NEC 215-8.
14. Method of bonding service equipment shall be per NEC 250-90. Meyers type threaded hubs approved for bonding by a nationally recognized testing laboratory are acceptable for bonding conduit to enclosures and may be substituted for conduit bonding bushings. Standard locknuts or sealing locknuts are not acceptable for bonding at service equipment.



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