



Date: October 7, 2010

Dear Ameren Electric Service Manual User:

A revised Electric Service Manual is now available dated October 1, 2010. The modifications are related to the name change as follows:

- Replacing logos
- Replacing Ameren Illinois Utilities, AmerenCIPS, and AmerenIP as Ameren Illinois
- Replacing AmerenUE as Ameren Missouri
- Changes to Ameren Illinois construction hotline phone numbers
- Changes to Ameren Missouri construction hotline phone number

The following pages are affected:

Page 1, 100-2, 100-3, 200-6, 500-2, 4 & 5, 600-6, 800-4, 1001-4, 1200-1, 1300-3, 4, 5 & 6

Ameren will not be sending out the latest update of Ameren Service Manual in hard copy. The latest update in electronic format is available on the Ameren website.
<http://www.ameren.com/BusinessPartners/Construction/Pages/ConstructionServicesHome.aspx>

At this site, you will also be able to get the latest catalog number information for the Ameren approved devices list as well as register your company to receive immediate notice of any updates.

As reminder, all enclosures utilizing Class 320 meter will contain an anti-inversion clip to prevent the installation of a 200 amp meter.

If you have any questions, please email them to ElectricServiceManuals@ameren.com or fax to Service Manual 314-554-3260.

A handwritten signature in black ink that reads "Jeffrey L. Hartenberger".

Jeffrey L. Hartenberger
Manager Supervisor – Standards
314-554-2747

Disclaimer

The information in this manual provides guidelines necessary to expedite the connection of electric service. Where details are shown, they are provided to assure the safety of individuals in the immediate vicinity of the electric service entrance. It is the responsibility of the customer, his engineers, and his contractors to assure that the installation meets all applicable codes. Ameren does not assume this responsibility.

AMEREN ELECTRIC SERVICE MANUAL

Foreword: Ameren is committed to providing a quality reference guide that facilitates the planning and installation of electrical equipment in a safe and professional manner. The Electric Service Manual incorporates Company Metering Requirements, Standards, and language in Company filed Schedule of Rates for Electric Services. This manual serves as a supplement not a replacement for the National Electrical Code, National Electrical Safety Code and any local authority guidelines. Qualified users of this manual should contact Ameren representatives for clarification of requirements and specifications. All electrical service wiring and equipment where Ameren owned conductors will be terminated, or that will contain Ameren owned metering equipment, shall be listed and used for the intended purpose as defined in the NEC, and shall be approved by Ameren.

Ameren Contact Centers

- Ameren Illinois: 800-755-5000
- Ameren Missouri: 866-992-6619

Call Before You Dig!

- Nationwide: 811
- Illinois: 800-892-0123
JULIE (Joint Utility Locating Information for Excavators)
- Missouri: 800-DIG-RITE (344-7483)

Customer Owned Underground Facilities

Underground facilities on a customer's premises that are owned by the customer, are not located by JULIE or DIG-RITE. These facilities may include but are not limited to septic systems, irrigation systems, underground wiring, and drainage systems. The customer is responsible for locating these facilities. Ameren will not be responsible for damage to facilities that are not properly located.



Section 100 General Information

107. INSPECTIONS AND PERMITS

The Customer shall secure and pay for all permits required by constituted authorities, for the installation and operation of the electrical wiring and other electrical equipment on the Premises. Company must receive notice of approval from said authorities prior to connection. In service areas void of inspection authority, Customer service entrance must conform to Company metering standards and current National Electrical Code. Company will not inspect nor be held liable for the condition or safe operation of Customer wiring beyond service disconnecting means. Company retains the right to refuse or terminate service.

108. LIMITATION OF LIABILITY

The Company will use reasonable diligence in furnishing uninterrupted and regular Electric Service, but will in no case be liable for interruptions, deficiencies or imperfections of service, except to the extent of a pro rata reduction of the monthly charges. Refer to Customer Terms and Conditions for additional information.

109. METER TAMPERING

The Company shall have the right to discontinue electric service to any Customer and remove its property from Customer premises, if there is evidence found of tampering with any meter or service wiring leading thereto, and where such tampering is for the purpose of reducing the registration of the Customer's electric consumption. See Customer Terms and Conditions pertaining to your service provider for additional information.

110. NUMBER OF SERVICES

The Company will normally provide service to Customer at only one Point of Delivery on each premises. The point on the Company's system where the Service Extension will terminate will be as designated by the Company. The Company may agree to provide service through multiple delivery points as described in the Excess Facilities section of the Standards and Qualifications For Electric Service.

111. SERVICE RELOCATION

Customers who request Company to relocate, convert or in some manner modify these facilities will reimburse the Company if the Company agrees to make the changes. Refer to Standards and Qualifications For Electric Service.

112. RESIDENTIAL SERVICE UPGRADE OR CHANGE (AMEREN MISSOURI – ST. LOUIS CITY & COUNTY)

Disconnect/Reconnect Customer's Service to Perform Wiring or Replace Customer-Owned Electrical Equipment

For services to be disconnected to replace/repair customer wiring or equipment, the following process applies:

In St. Louis City and St. Louis County:

Contractors may disconnect and reconnect customer's service **ONLY** when **ALL** of the following conditions apply:

- The electrical contractor is licensed in the county or municipality where the work is to be completed
- The service is a single residential Ameren Missouri customer
- The meter is a typical residential type electric meter (120/240V, single phase, self contained)
- The service size will remain the same after the work is completed
- The same meter will be removed and reinstalled during the same day
- The billing account is active at this service location



Section 100 General Information

If **ALL** of the above conditions apply, the contractor must complete the following requirements before proceeding with the work:

- • Call Ameren Missouri Construction Hotline at 866-992-6619 (M-F, 7AM to 5:30PM) to obtain approval;
- • Provide inspection permit number to Ameren Missouri

■ If **ALL** of the above conditions **DO NOT APPLY**, call 866-992-6619 to schedule Ameren Missouri personnel to perform the work.

Outside St. Louis City and St. Louis County:

If the customer's service is located outside of St. Louis City or St. Louis County, the contractor must **NOT** disconnect or reconnect the service. Call one of the following numbers to schedule Ameren personnel to perform the work:

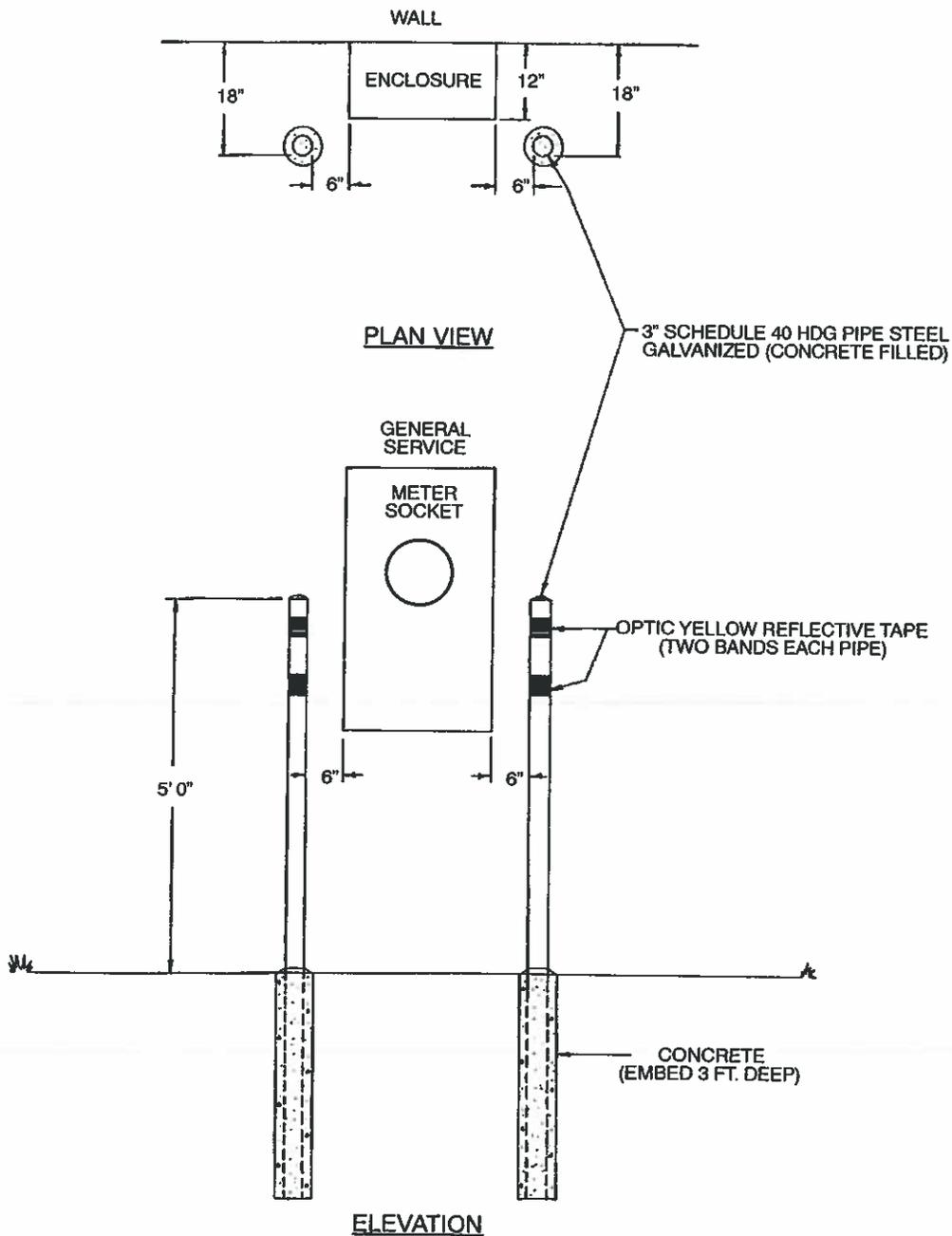
- Ameren Illinois 800-755-5000
- Ameren Missouri 866-992-6619



Section 200
Metering Requirements

METER EQUIPMENT PROTECTIVE BARRIER
(METER ENCLOSURES SHOWN-
OTHER DEVICES SHALL BE SIMILAR)
CUSTOMER INSTALLED

Figure 200-1B



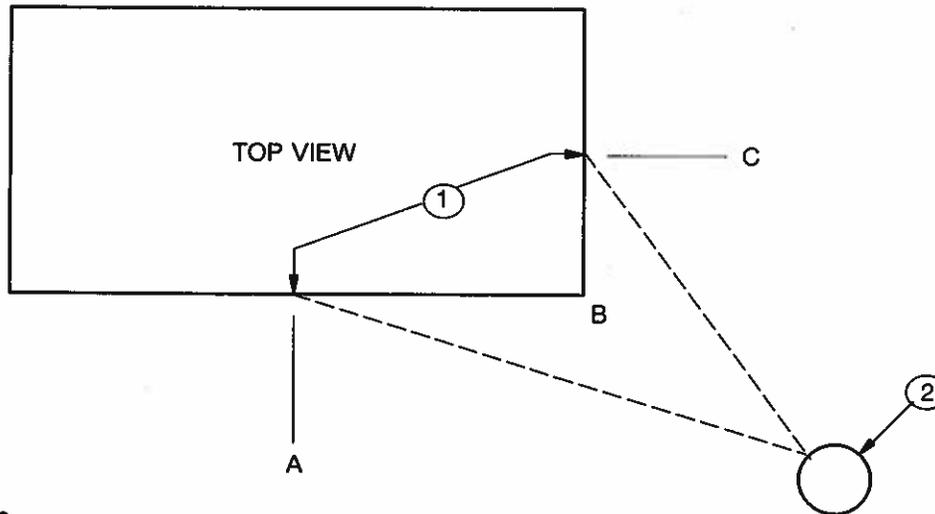
ALTERNATIVE BARRIERS
INCLUDE:

- A. WALL SUPPORTED BRACKETS FOR PUBLIC SAFETY.
- B. CONCRETE CURBS FOR VEHICULAR BARRIER.

Section 200
Metering Requirements

**LOCATION FOR POINT OF
DELIVERY ON BUILDINGS**
Figure 200-1C

AN APPROVED LOCATION FOR THE POINT OF DELIVERY TO A CUSTOMER'S PREMISES WILL NORMALLY BE BETWEEN THE MIDPOINTS OF THE BUILDING FROM THE CORNER NEAREST THE COMPANY'S DISTRIBUTION SYSTEM.



NOTES:

1. These guidelines apply to the Ameren Illinois only. In Missouri, contact your local Ameren representative for the guidelines that apply in the area where service is being requested.
2. A and C are the midpoints of the building. The service may be located anywhere between A and B or B and C observing clearance requirements from windows, chimneys, driveways, trees, etc. outlined in Figure 600-6A and Section 200.01 Location.
3. Distribution point from Ameren System may be overhead or underground. Refer questions to an Ameren representative if recommended location is not feasible.
4. Applicable charges are governed by State tariffs. Contact your local Ameren representative for an explanation of charges that may apply.

Section 500 Grounding

500.01 GENERAL

All service systems that operate below 1000 volts contain a grounded neutral or a grounded phase conductor used as a circuit conductor in the system.

The grounded neutral or grounded phase conductor is grounded at the supply transformer and will be run from the transformer bank to the meter socket and to each service disconnection means in accordance with the latest edition of the NEC.

Where an underground service will be owned by Ameren, the service riser conduit is for Ameren use only. The grounding electrode conductor shall not be placed in this conduit.

Additional grounding may be required by Ameren depending on the installations.

Customers requiring an ungrounded service for operation of a ground detection system, or for other operations as permitted by the National Electrical Safety Code, shall submit an exception request detailing the special circumstances necessitating the request. In addition, the customer shall state in the exception request that he is aware of and accepts the increased risks to personal safety associated with an ungrounded service. When supplying an ungrounded service results in an additional cost to the Company, the additional cost may be passed on to the customer.

500.02 DRAWINGS

1. Figure 500-1A: Grounding Methods, 1Ø and 3Ø Self Contained Metering less than 480 volts
2. Figure 500-2A: Grounding Methods, 1Ø and 3Ø Cold Sequence Metering where 480 Volts is present in the meter socket, Option 1
3. Figure 500-3A: Grounding Methods 1Ø and 3Ø Cold Sequence Metering where 480 Volts is present in the meter socket, Option 2
4. Figure 500-4A: Grounding Methods, 1Ø and 3Ø Cold Sequence Metering where 480 Volts is present in the meter socket, Option 3
5. Figure 500-5A: Grounding Methods, 1Ø and 3Ø, Instrument Transformer Metering



Section 500 Grounding

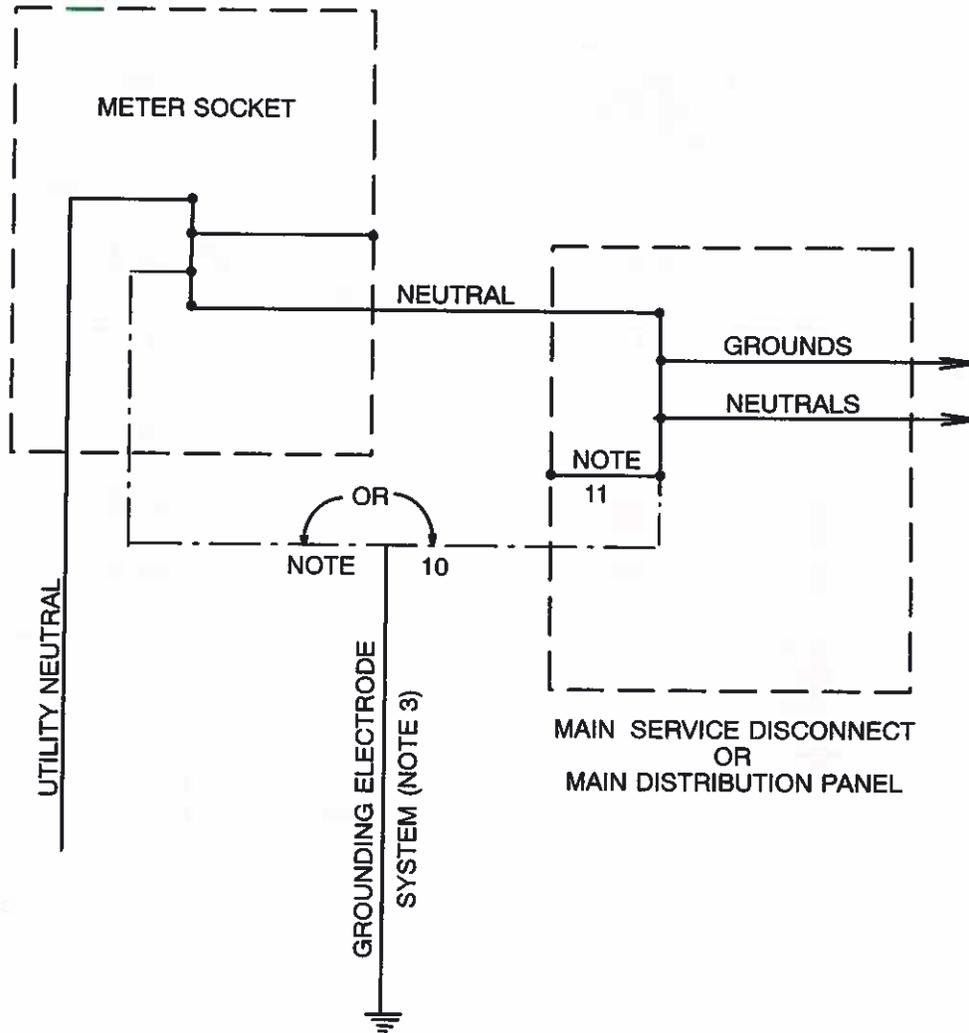
GROUNDING METHODS NOTES

These notes relate to the drawings in the Grounding Section of this manual. All notes do not apply to all drawings. Applicable notes are noted in each drawing.

1. The grounding method drawings are schematic in nature. Actual wiring details will vary between equipment and manufacturer.
2. The details shown in these drawings are not a substitute for an understanding of the grounding and bonding requirements of the National Electrical Code (NEC) and the requirements of the Jurisdiction Having Authority in the area the work is taking place.
3. The grounding electrode system is defined in the NEC. Refer to the NEC or the Jurisdiction Having Authority for details regarding the make-up of the grounding electrode system.
4. This method allowed by the NEC where certain conditions are met. (Reference 2008 NEC 250.142(B), Exception 2). Also see Notes 12 and 13.
5. Some local inspectors require neutral to be isolated from the grounding electrode conductor in meter socket. In this situation refer to drawing Figure 500-3A. Installer must purchase a meter socket neutral isolation kit or similar insulated connector if it is not included as part of the socket.
6. The cold sequence main/meter cabinet shown is acceptable in all Ameren areas. Where there is a local Authority Having Jurisdiction, verify that it is acceptable to them before purchasing.
7. The bond between the customer's grounded conductor and the equipment grounding conductor can only take place at this location. This avoids placing the customer's grounding electrode conductor and customer's grounded conductor in parallel.
8. Some installations have a neutral lead connected between the service neutral in the meter enclosure to the neutral position on the meter socket. Connection of this wire must be maintained regardless of whether the neutral is isolated as described in Note 5 or not.
9. The neutral terminal bar must be isolated from ground in this application.
10. The grounding electrode system may be connected to the meter socket (or CT/PT enclosure) neutral, or the service equipment neutral, but not both when it would create a parallel path for neutral current.
11. The equipment cabinet must be bonded to neutral and ground in this application.
12. This method will not be approved by Ameren Illinois unless approved by a local Jurisdiction Having Authority. For the Ameren Illinois approved method, see Figure 500-3A.
13. This method is required in Illinois where a separate main enclosure and meter socket enclosure are used unless another method is approved by a local Jurisdiction Having Authority.
14. Bonding of metallic conduit systems is not shown in any of the drawings.

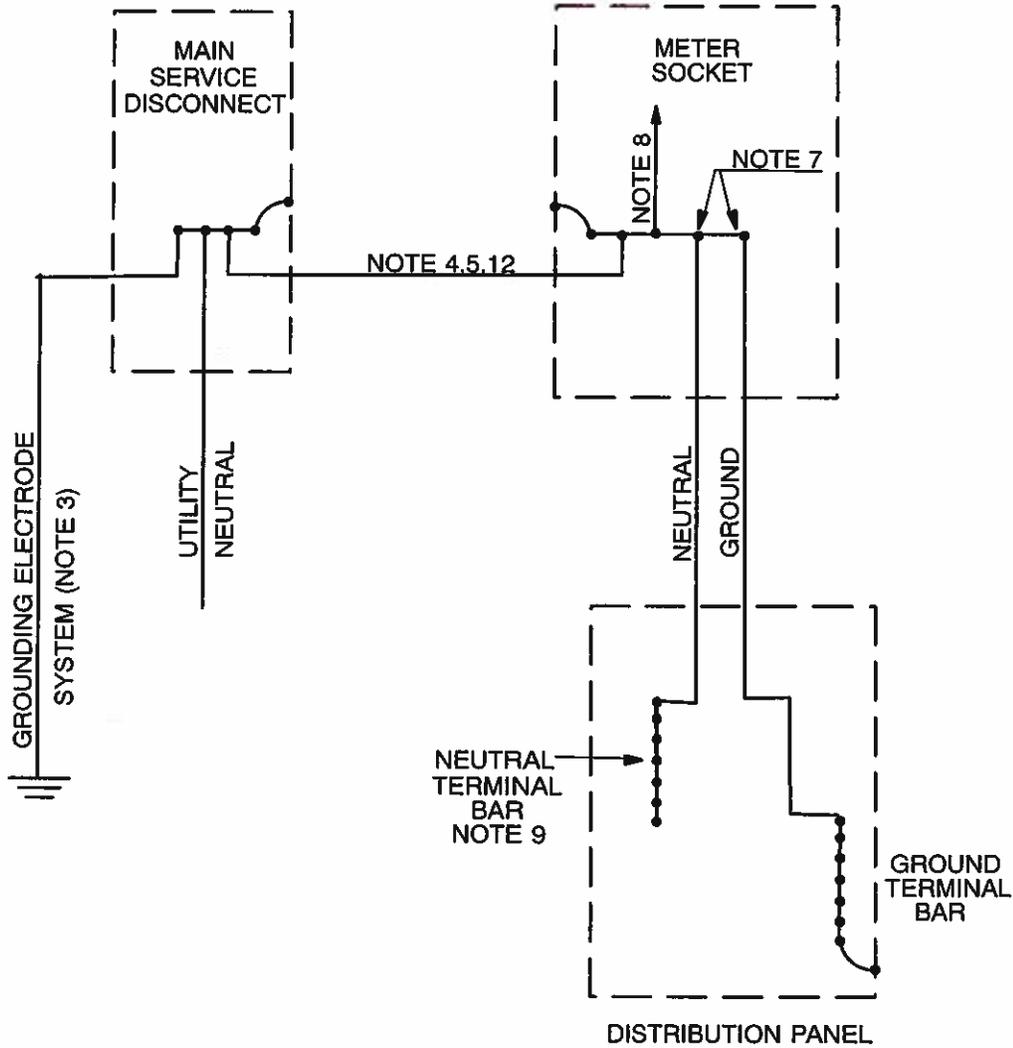


GROUNDING METHODS
1Ø AND 3Ø SELF CONTAINED METERING LESS THAN 480 VOLTS
Figure 500-1A



See notes 1, 2, 14, and notes shown above as part of the drawing.

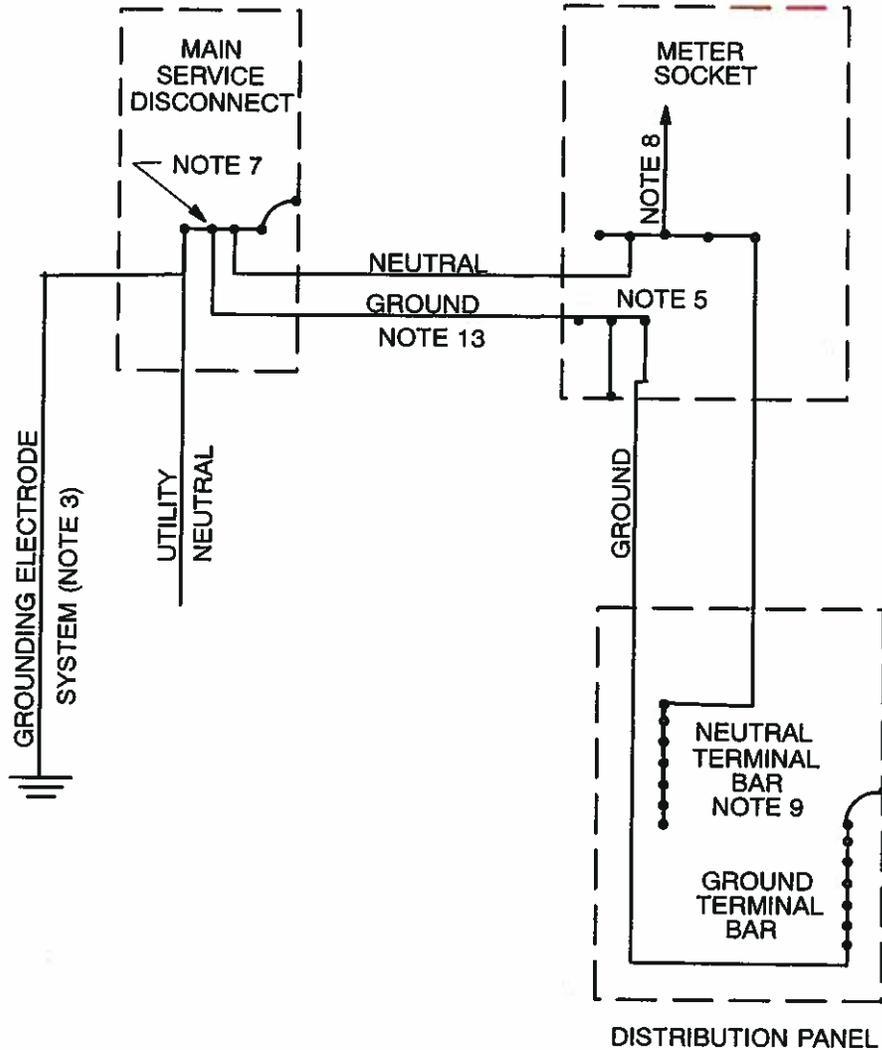
GROUNDING METHODS
1Ø AND 3Ø COLD SEQUENCE METERING WHERE
480 VOLTS IS PRESENT IN THE METER SOCKET
OPTION 1
Figure 500-2A



See notes 1, 2, 14, and notes shown above as part of the drawing.

This method will not be approved by Ameren Illinois unless approved by a local Jurisdiction Having Authority. For the Ameren Illinois approved method, see Figure 500-3A. (Note 12)

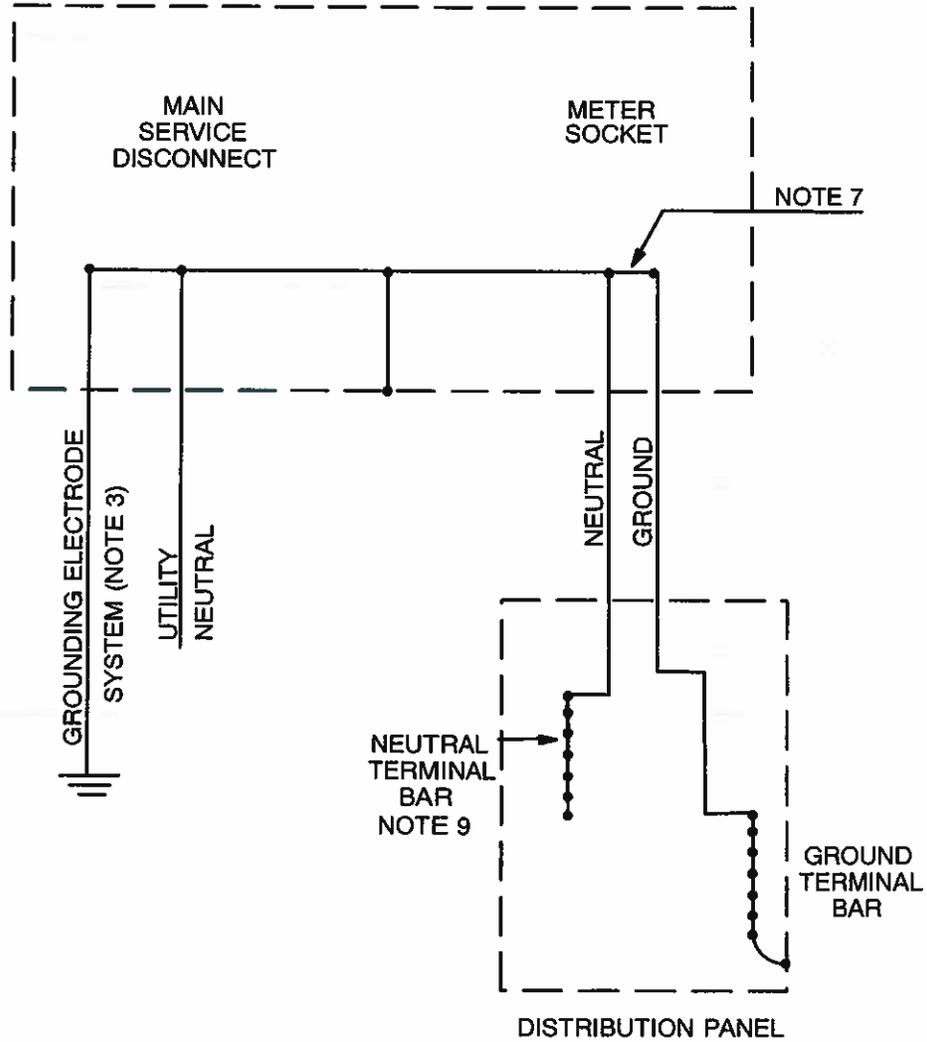
GROUNDING METHODS
1Ø AND 3Ø COLD SEQUENCE METERING WHERE
480 VOLTS IS PRESENT IN THE METER SOCKET
OPTION 2
Figure 500-3A



See notes 1, 2, 13, 14, and notes shown above as part of the drawing.

■ This method is required in Ameren Illinois where a separate main enclosure and meter socket enclosure are used unless another method is approved by local Jurisdiction Having Authority. (Note 13)

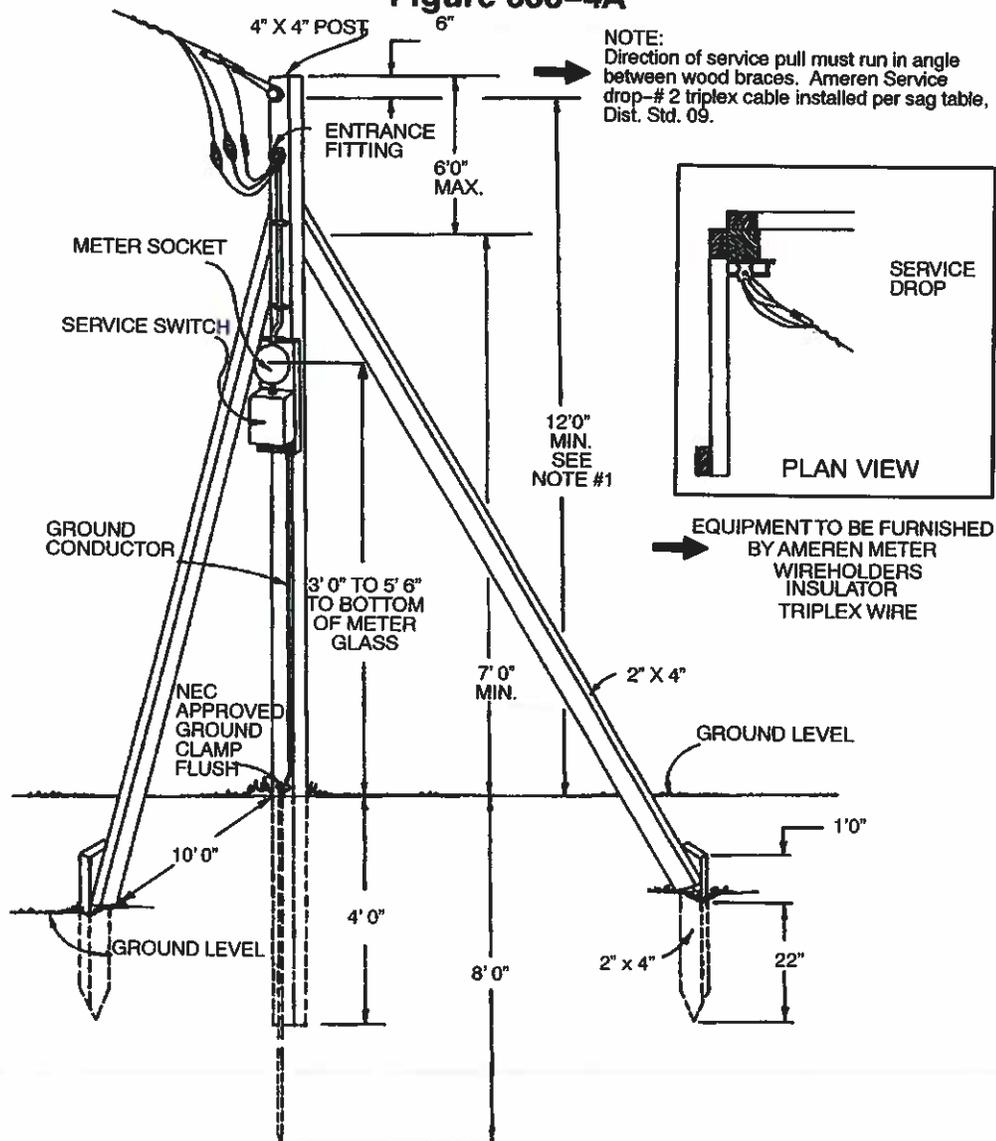
GROUNDING METHODS
1Ø AND 3Ø COLD SEQUENCE METERING WHERE
480 VOLTS IS PRESENT IN THE METER SOCKET
OPTION 3: MAIN / METER COMBINATION
Figure 500-4A



See notes 1, 2, 6, 14, and notes shown above as part of the drawing.

SERVICES
OVERHEAD TEMPORARY SERVICE POLE
CLEARANCE AND METER POLE
PROVIDED BY CUSTOMER FOR ANCHORAGE OF COMPANY'S
SERVICE DROP AND INSTALLATION OF COMPANY'S METER

Figure 600-4A



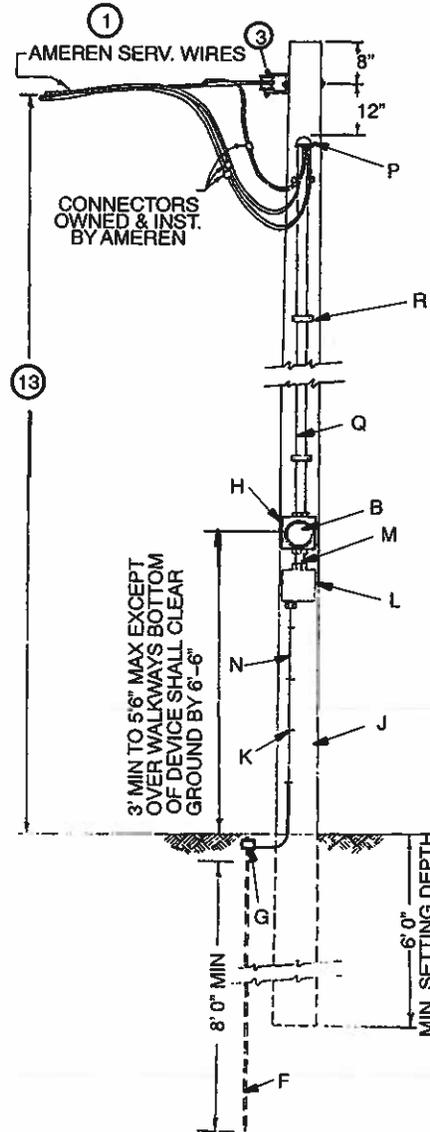
NOTES:

1. See Section 800 for minimum height of wire above ground at point of greatest sag.
2. Where practical, the service to the temporary connection should be installed in a manner suitable for transfer to the permanent location.
3. Temporary pole shall be located between 10 ft. and 75 ft. away from an Ameren pole.
4. GFCI protection required on all temporary wiring per NEC.
5. Refer to Section 1000 for meter socket requirement.
6. Refer to Section 800 for required clearances.

Section 600
Overhead Services

**METER POLE INSTALLATIONS
CUSTOMER-OWNED SECONDARY METERING
UNDERGROUND DISTRIBUTION INSTALLATION
100 OR 200 AMPERE, SINGLE-PHASE**

Figure 600-5A



See notes and material list next page.



Section 800 Clearances

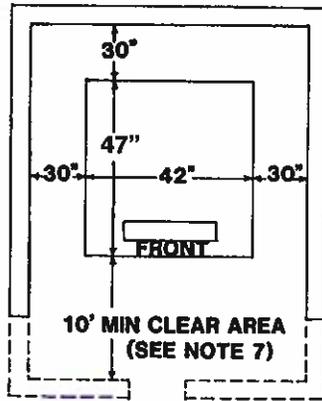
Clearances of Services over Swimming Areas

Although it is possible to have services over swimming areas, this practice is discouraged. It is necessary that the maximum conductor sag under various operating and environmental conditions be determined. Contact your local Ameren representative for assistance.



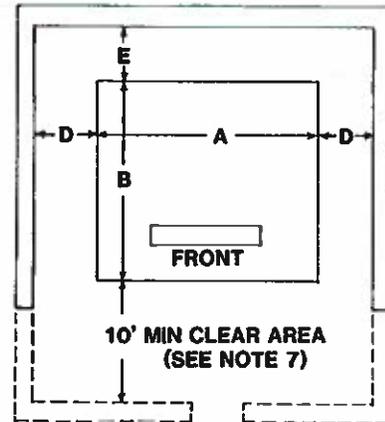
Section 800 Clearances

CUSTOMER INSTALLED PAD INSTALLATIONS REQUIRED CLEARANCES FOR PADMOUNTED TRANSFORMERS AND SWITCHGEAR FOR 15 KV (REFERENCE DISTRIBUTION CONSTRUCTION STANDARDS 59 81 51 11)



1 Ø INSTALLATIONS

25-167 KVA TRANSFORMERS



3 Ø INSTALLATIONS

Dimensions for 1Ø pads pertain to all Ameren Companies.

For 3Ø installations, dimensions A and B pertain to dimensions of Ameren Missouri equipment pads. Pad specifications for Ameren Illinois vary.

The critical dimensions for all padmounted equipment are the distances from the left, right, rear, and front of pads, not the equipment installed on the pad. These dimensions shall be maintained in all installations.

Verify pad dimensions with your local contacts.

| 3Ø INSTALLATIONS | A | B | D | E |
|---|-----|-----|-----|------|
| 75 Thru 300 kVA Radial Feed Transformers | 72" | 65" | 30" | 35" |
| 500 & 750 kVA Radial Feed Transformers | 72" | 65" | 45" | 43" |
| 75 Thru 1000 kVA Loop Feed Transformers | 84" | 72" | 45" | 44" |
| 1000 Thru 2500 kVA Radial Feed Transformers | 84" | 72" | 45" | 56" |
| Switchgear (Live Front) | 69" | 63" | 48" | 120" |
| Switchgear (Dead Front) | 76" | 74" | 48" | 120" |

NOTES:

1. If pad mount is enclosed on all 4 sides, 10' minimum clearance from the front of transformer to inside of wall must be maintained for hot stick operations.
2. If a 4 sided enclosure is used, an opening or doorway shall be provided. If a lock is required provisions shall be made to provide Ameren personnel access.
3. If a 4 sided enclosure is used, a minimum of 10 square feet of venting space in the form of 50% effective louvers or 5 square feet of opening shall be provided located along the bottom of each wall. If a 3 sided wall is used, wall venting space is desirable, but not required.
4. Location must be accessible for installing or replacing transformer with crane.
5. Developer to provide plastic conduit of size specified by Ameren to a point designated by Ameren outside the wall 36" to 42" below final grade.
6. The 10' distance between the front of the pad and the wall may be reduced to 48" if an opening or gate is provided. The opening or gate should be centered on the front of the pad and should provide for a minimum opening of 3-1/2' for 1Ø and 9-1/2' for the 3Ø installation. A 10' clear area in front of the pad must still be available with the opening or when the gate is open for hot stick operations.
7. To provide for transformer replacement, enclosed area is to be free of overhangs or overhead obstructions. Wall height not to exceed 8' unless the above mentioned gate or opening is provided or an easily removable wall is used.
8. Should upgrading be required, the dimensions as shown provide adequate ventilation and space for 1 size larger transformer.

**Section 1001
Current Transformer Installations
For Services Under 600V**

4. Current Transformer Installations – Square D 201–1200 amp
Figure 1001–5A
Figure 1001–5B
5. Current Transformer Installations – Square D 1201–3000 amp
Figure 1001–5C
Figure 1001–5D

1001.08 CT/PT ENCLOSURE INSTALLATION DRAWINGS

1. 120/240 volt, 1 phase, 3 wire, 401–800 amp and 240 volt, 3 phase, 3 wire, 401–1200 amp installations
Figure 1001–6A
2. 480 volt, 3 phase, 3 wire, 201–600 amp installations
Figure 1001–6B
3. 120/208 volt 3 phase, 4 wire 401–1200 amp installations
Figure 1001–6C
4. 120/208 volt, 3 phase, 4 wire, 1201–3000 amp installations
Figure 1001–6D
5. 277/480 volt, 3 phase, 4 wire, 201–1200 amp installations
Figure 1001–6E
6. 277/480 volt, 3 phase, 4 wire, 1201–3000 amp installations
Figure 1001–6F

Section 1100
Ameren Approved Metering Devices List

A list of approved customer provided manufacturer's meter devices catalog number in Section 1100 has been removed and posted separately from the Manual due to constant changes. To get the latest catalog number information for the devices, please use the website as indicated below.

At www.ameren.com/ under Business Partners – Construction Services

Or

Go to

<http://www.ameren.com/BusinessPartners/Construction/Pages/ConstructionServicesHome.aspx>

As updates are made available, we will advise you by email. You will then be able to access these updates through the Ameren website.



Section 1200 Customer Generator Installations

1200.01

Ameren is committed to both the safety of the public and its employees and to the reliable operation of its distribution system. Installations involving customer-owned and operated generating equipment create the potential for serious personal injury as well as damage to the Customer's or Company's equipment.

1200.02

Installation plans for ALL permanently installed customer-owned generating equipment or permanently installed transfer switches, whether for backup or continuous duty, shall be submitted to Ameren for review and approval.

The company reserve the right to inspect customer installed generation and associated equipment even though it is behind the service disconnecting means.

1200.03

Ameren's installation requirements and application form(s) can only be obtained from a local Ameren engineering representative or by calling the Ameren Customer Contact Center (866-992-6619 in MO or 800-232-2477 in IL).

Illinois, <http://www.ameren.com/sites/aiu/source/ILChoice/Documents/BackUpGenerationApp.pdf>

Missouri, <http://www.ameren.com/sites/aeu/source/SafeConnect/Documents/DocumentC0Form.pdf>

1200.04

The following information is only a summary of Ameren's requirements for BACKUP GENERATION that operates with either an open transition or a closed transition of less than 100 milliseconds in duration. The complete requirements and application must be secured as noted above.

1200.05 GENERAL REQUIREMENTS

7. Main service disconnect that is padlockable in the open position if the Ameren service being backed up is less than 600V
8. Single "visible open" disconnect device per generating unit if the Ameren service being backed up is greater than 600V – refer to Ameren's full requirements for details on satisfying this requirement
9. Transfer equipment (manual or automatic) to prevent inadvertent continuous interconnection of sources
10. Signage permanently installed at the revenue meter indicating (1) the presence of generation and (2) the availability of either a padlockable main service disconnect or a "visible open" disconnect for isolation
11. Signage permanently installed at the padlockable main disconnect or "visible open" disconnect for purposes of identification

1200.06 REQUIREMENTS FOR OPEN TRANSITION

1. Any of the following methods can be used:
 - 1.1 Integral transfer switch with mechanical interlocking provisions.
 - 1.2 Kirk key interlocked solid blade switches or circuit breakers.
 - 1.3 Electrically interlocked circuit breakers with backup protection via hard-wired breaker auxiliary contacts.
2. Automatic transfer schemes shall include the following:
 - 2.1 Voltage-sensing capability to detect the loss and recovery of the Ameren source
 - 2.2 Open transition manual "bypass" (i.e. auto disable) is highly recommended, though not required



Section 1300
St. Louis Downtown Network

system. Service connections to the downtown NW distribution system, under NEC Article 230.71, Maximum Number of Disconnects, or the "6 Switch Rule," shall NOT be allowed.

1300.04 COMMERCIAL/RESIDENTIAL HIGH-RISE MULTI-METER INSTALLATIONS

Multi-story structure residential metering centers shall be located on every 3rd floor to allow metering of the meter center floor and the floor above and below. Should building geometry prevent metering from every 3rd floor, the Customer should contact the Company to receive a variance for alternate meter center locations.

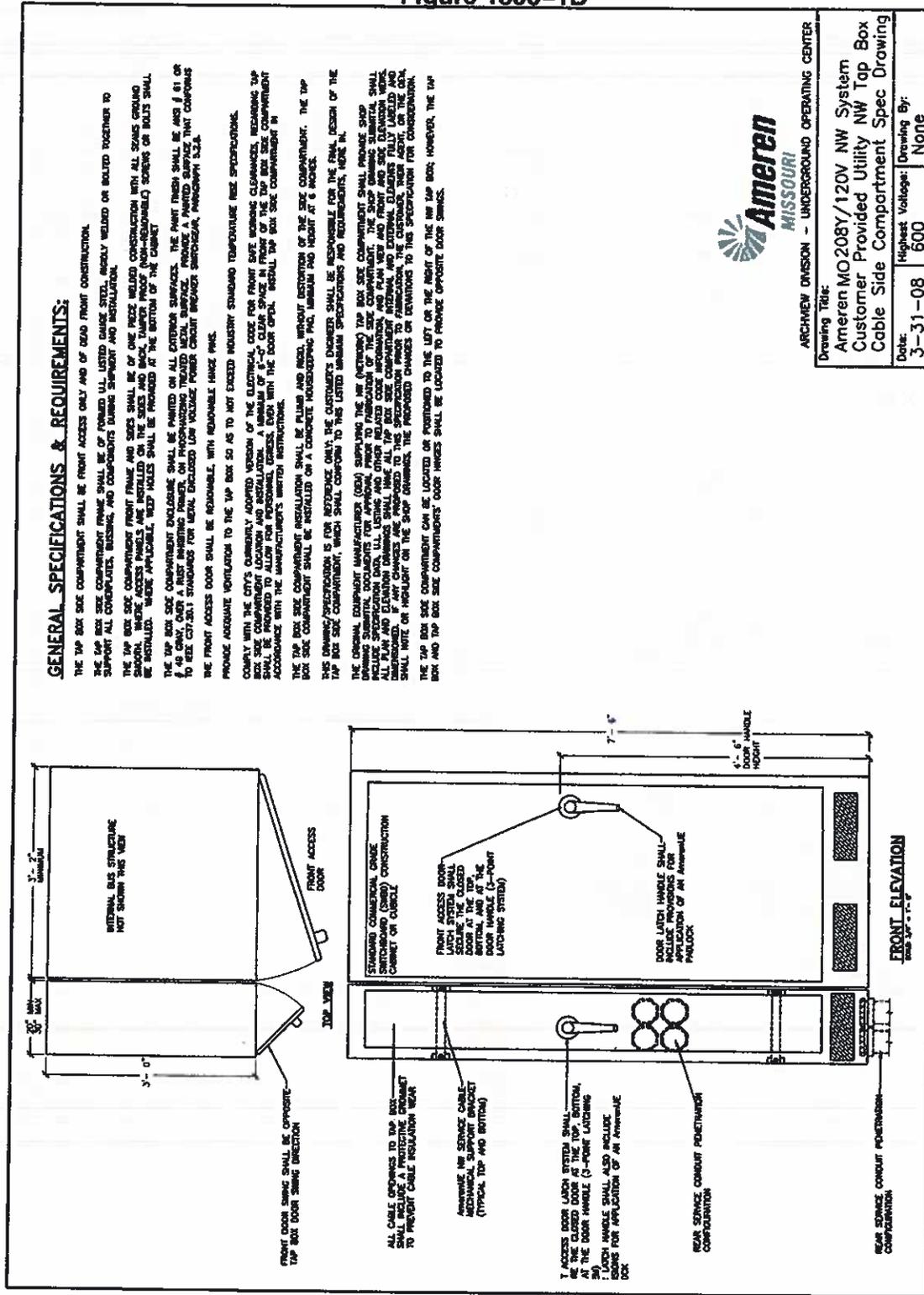
Multi-story residential lofts, with Customer provided meter equipment on every third floor, the customer provided vertical riser shall be buss duct (vertical risers made with any cable system, armored or in conduit, shall NOT be allowed). If the customer wishes to install horizontal distribution 600V cable and conduit between the bus duct riser and the modular meter center, within the floor meter center room, this is acceptable if the cable termination boxes at the bus duct riser and the modular meter center are equipped by the original equipment manufacturer with provision for application of a minimum of two (2) Company metering seals to the front access panels. The side, top, and bottom panels, if not seamless construction, shall be equipped with tamper proof seals. The bus duct riser and the residential modular metering center shall be located in the same room or space, within close proximity to each other (see service manual drawing for guidelines on preferred high-rise loft service configuration).

All customer metering equipment (bus duct riser, modular meter center equipment, and mains) and the customer metering equipment configuration shall be approved by the company prior to the customer purchasing and installing such equipment.



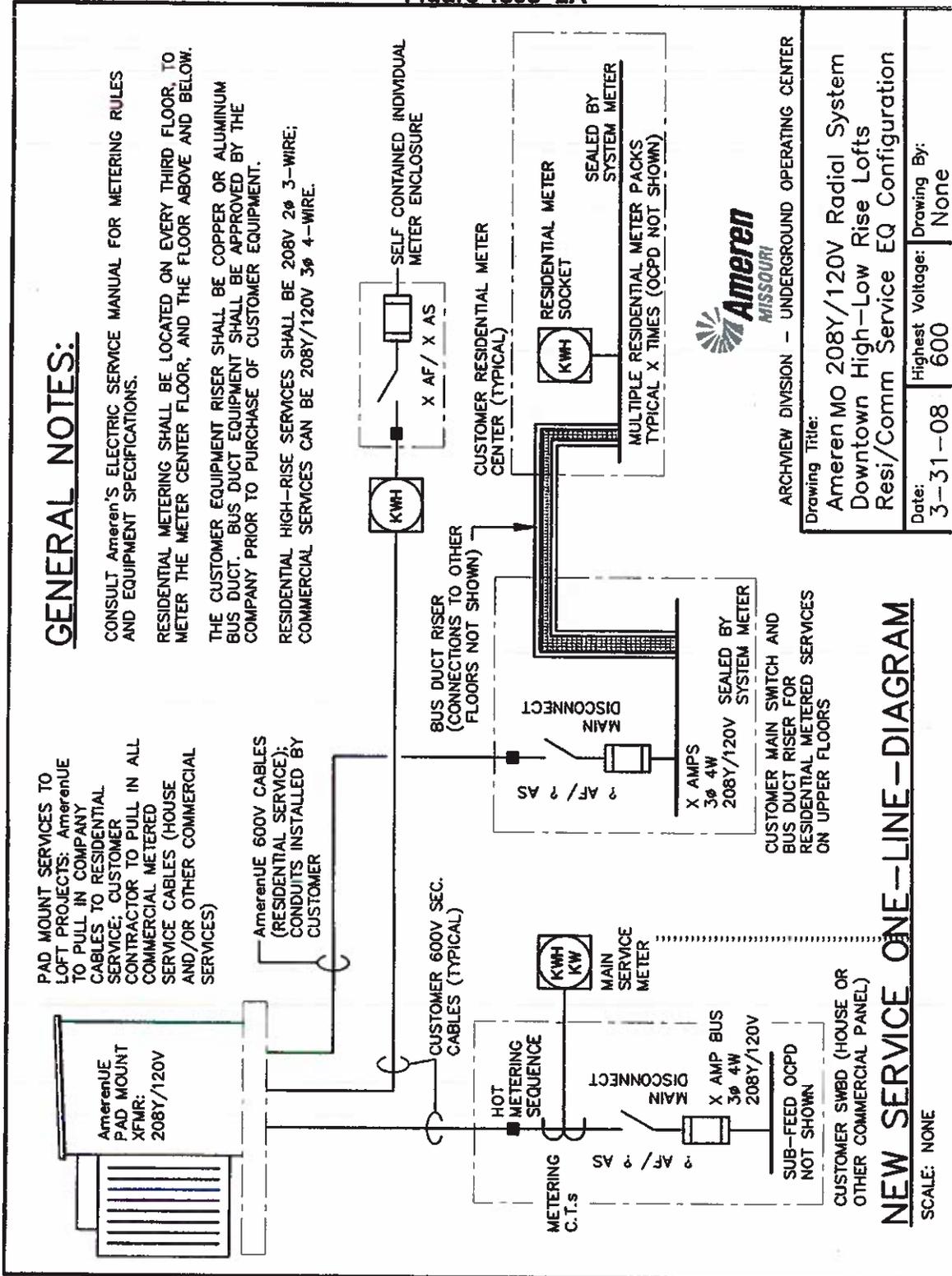
Section 1300 St. Louis Downtown Network

Network Tap-Box Side Compartment Spec Dwg. Figure 1300-1B



Section 1300
St. Louis Downtown Network

Network High-Rise Service EQ Configuration
Figure 1300-2A



Pad Mount Transformer High-Rise Service EQ Configuration
Figure 1300-2B

