ELECTRIC SERVICE MANUAL

Revised November 1, 2022

You can access this manual at

BuildWithAmeren.com

Note: Updates to this manual will be made on a regular basis and posted at the website mentioned above. It will be the responsibility of the holder of this manual to update the manual from information at the website.

WARRANTIES AND DISCLAIMERS

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.

1. As an Ameren Customer, the Customer's representative, the Customer's contractor, or the Customer's engineer, it is your responsibility to ensure that equipment is installed in a condition acceptable to and approved by the governmental inspection authority having jurisdiction in the territory in which the Customer's Premises is located, or, where no authority exists, in accordance with Ameren's standards, the requirements of the latest edition of the National Electrical Code ("NEC"), the latest edition of the National Electrical Safety Code ("NESC"), and any other applicable codes.

2. As an Ameren Customer, you are responsible for any damage, alteration or interference with Ameren's metering or other electrical equipment on Premises.

3. The Customer further understands that they are required to secure and pay for all permits required by the constituted authorities for the installation and operation of the electrical wiring and other electrical equipment on the Premises, and that Ameren must receive notice of the approval from said authorities prior to connection unless (1) the authority having jurisdiction has in writing waved this requirement or (2) in areas where there is no inspection authority.

4. The Customer understands that Ameren ***may***, but is not required to, identify wiring and electrical equipment practices that may raise safety and/or reliability concerns for Ameren and / or the Customer on the Customer's side of the point of delivery, including beyond the service disconnecting means. Ameren reserves the right to identify and require the correction of safety and/or reliability concerns prior to connection of service. Ameren retains the right to refuse or terminate the connection of service.

5. To the extent that Ameren does identify wiring and electrical equipment practices that may raise safety and/or reliability concerns for Ameren and/or the Customer on the Customer's side of the point of delivery, the Customer or the Customer's representative should understand that said identifications are not being made by certified inspection authorities and should be verified by a certified inspector and/or local governmental authorities having jurisdiction.

6. AMEREN DOES NOT WARRANT ANY IDENTIFICATION OF WIRING AND ELECTRICAL EQUIPMENT PRACTICES THAT MAY RAISE SAFETY AND / OR RELIABILITY CONCERNS ON THE CUSTOMER'S SIDE OF THE POINT OF DELIVERY, EXPRESSLY OR IMPLIED. AMEREN MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING THE SERVICES OR INSPECTIONS.

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.

The latest edition of Ameren Electric Service Manual is effective as of November 1, 2022. There will be a grace period on limited issues for compliance with new requirements until March 1, 2023.

For **Ameren Missouri**, there will be a grace period for compliance of the new requirements for the outdoor disconnect and surge protection per 2020 NEC found in **Section 300** until January 1, 2024.

Ameren Customer Service

- Ameren Illinois:
  Residential 1-800-755-5000
  Business 1-800-232-2477
- Ameren Missouri:
  Residential 1-800-552-7583
  Business 1-877-426-3736

Ameren Construction Services - BuildWithAmeren.com

- Ameren Illinois 1-888-659-4540 IllinoisConstruction@ameren.com
- Ameren Missouri 1-866-992-6619 ConstructionHotline@ameren.com

Call Before You Dig!

- Nationwide: 811
- Illinois (JULIE): 800-892-0123 or www.illinois1call.com
- Missouri (DIG-RITE): 800-DIG-RITE (344-7483) or www.mo1call.com

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 water lines, 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.

TABLE OF CONTENTS

700. UNDERGROUND SERVICE INSTALLATIONS

1000. CUSTOMER FURNISHED SELF-CONTAINED METER MOUNTING SOCKETS REQUIREMENTS

Figure 1001-3C (Sheet 1): CT / PT COMPARTMENT PHYSICAL DIMENSION - 208Y/120V; 480Y/277V, 1201 – 4000 AMPERES

4. AMEREN APPROVED SWITCHBOARD - **SQUARE D / SCHNEIDER** CT / PT COMPARTMENT

Figure 1001-4A (Sheet 1 of 3): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES

Figure 1001-4A (Sheet 2 of 3): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES

Figure 1001-4A (Sheet 3 of 3): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES

Figure 1001-4B (Sheet 1 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES

Figure 1001-4B (Sheet 2 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES

Figure 1001-4B (Sheet 3 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES

Figure 1001-4B (Sheet 4 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES

5. AMEREN APPROVED - **AMERICAN MIDWEST POWER** CT/PT COMPARTMENT

Figure 1001-5A: 208Y/120 Volt, 800 - 1200 AMPERES

Figure 1001-5B: 208Y/120 Volt, 1201 - 4000 AMPERES

Figure 1001-5C: 480Y/277 Volt, 800 - 1200 AMPERES

Figure 1001-5D: 480Y/277 Volt, 1201 - 4000 AMPERES

Figure 1001-5E: 480 VOLT, 3-PH, 4-WIRE METER CENTER

Figure 1001-5F: 480 VOLT, 3-PH, 4-WIRE METER CENTER

6. AMEREN APPROVED SWITCHBOARD – **ELECTRO-MECHANICAL INDUSTRIES INC(EMI)** CT / PT COMPARTMENT

Figure 1001-6A: 208Y/120V; 480Y/277V, 800 - 1200 AMPERES OVERHEAD FEED

Figure 1001-6B: 208Y/120V; 480Y/277V, 800 - 1200 AMPERES UNDERGROUND FEED

1500. CUSTOMER DISTRIBUTED ENERGY RESOURCES (DER) IN PARALLEL / AMEREN ILLINOIS DISTRIBUTION SYSTEM

100.01 ACCESS TO CUSTOMER'S PREMISES

Customer shall permit, at all reasonable hours, authorized agents of Company, free and safe access to customer premises for the purpose of installing, inspecting, reading, removing, repairing, testing Company metering equipment, or any other purpose deemed necessary by Company. Customer must provide suitable working space on customer property, utility easement, and / or public right of way, which is free of obstructions and is not used for storage.

Permanent ladders or stairways shall be provided by the customer to meet either International Building Code (IBC), International Residential Code (IRC) or OSHA requirements, depending upon its use, and the latest NEC, at no cost to Ameren, when Ameren's equipment is located on platforms, balconies, mezzanine floors, roofs, or other hard to reach areas as specified by Ameren. Proper access will ensure safety for Ameren's employees and safe, reliable service for the customer.

Three types of Safety Codes for Stairs:

1. International Building Code (IBC) - commercial stairs used by the public. These must account for safety of every type of person, including children and elderly.
2. International Residential Code (IRC) - residential exterior stairs for one- and two-family dwelling and townhouse not more than three stories above grade.
3. Occupational Safety and Health Administration (OSHA) - industrial stairs at private facilities - not intended for public use.

Major difference between IBC, IRC, and OSHA construction:

1. IBC & IRC stairs have less rise over run, thus requiring a lot more room. Requires intermediate landings if the working platform you are accessing is greater than 12 ft above starting point.
2. IBC & IRC stairs require minimum treads 10 in. deep (or 11 in. deep without nosing) on steps; open risers cannot allow a 4 in. sphere to pass through if above 30” from ground; and no gaps larger than 4 in. between handrails and guards.
3. OSHA construction - stairs not intended for public use, take up less space, and are designed to be used by designated employees.

Customer is recommended to research additional differences between IBC, IRC, and OSHA stairs for their intended application.

Standard stairs (incline of 30 to 50 degrees) are Company standard for accessible elevated platforms. If room does not exist for standard stairs, the Company may consider ship stairs (incline of 50 to 70 degrees) or spiral stairs with Field Engineering Supervisor and Field Metering Supervisor approval prior to purchase / construction.

Fixed ladders are also an acceptable means to access elevated platforms. Individual rung ladders and portable ladders are not permitted.

OSHA articles to reference, but not an all-inclusive list:

1910.23 - Ladders (Company only accepts Fixed Ladders)

1910.25 - Stairways

1910.28 - Swing Gate at top of Stairs or fixed ladder; Personal Fall Arrest Systems or Ladder Safety Systems on Fixed Ladders

1910.29 - Fall protection systems and falling object protection-criteria and practices, including handrails

Always consult with Ameren prior to purchasing material and construction of elevated metering platforms.

100.02 APPLICATION FOR SERVICE

Any person, developer, firm, organization, association, corporation, or entity whose premises is located within the territory served by Company can request service by making application through the Ameren Illinois Construction Services or Ameren Missouri Construction Services listed in the foreword of this manual or **BuildWithAmeren.com**.

100.03 AVAILABILITY OF SERVICE

Electric service is available to any Customer located in Company's Service Area. Customer will agree to abide by Company's Terms and Conditions, Standards and Qualifications for Electric Service and any other requirements of the Schedule of Rates for Electric Service. The standard electric service furnished by Company is 60 Hertz alternating current.

100.04 COMPANY OBLIGATIONS

Company shall furnish service within a reasonable length of time dependent upon the availability of labor and material and after all necessary permits / easements and approvals are obtained from the customer and others.

100.05 POINT OF DELIVERY OF SERVICE

“Point of Delivery” means the point at which the entity providing distribution facilities connects its lines or equipment to the lines or facilities owned or rented by the Customer, without regard to the location or ownership of transformers, substations, or meters, unless otherwise provided for by written contract or tariffs.

100.06 DISCONNECTION AND RECONNECTION OF SERVICE

The Company has the right to discontinue service to any Customer and remove its property from Customer's Premises, after due notice. If Customer wiring and equipment is found to be unsafe or unsuitable to receive electric service and a harmful condition exists, Company reserves the right to terminate service immediately. A Customer's service that has been disconnected shall be reconnected after customer has furnished satisfactory evidence of compliance with the Company's Terms and Conditions and paid all applicable fees and charges. For additional information, go to:

Ameren Illinois:

Ameren Illinois Standards and Qualifications for Electric Service

Ameren Missouri:

Ameren Missouri General Rules and Regulations – Disconnection and Reconnection of Service

100.07 CUSTOMER OBLIGATIONS

Inform Company as to the size and characteristics of the load that is to be initially and thereafter served, the location of the Premises, the need date, and any special circumstances or conditions affecting the supply of electric service by Company. Customer is responsible for securing information from Company regarding available facilities at a particular location.

For Ameren Illinois, refer to **Standards and Qualifications for Electric Service in Ameren Illinois** for additional information.

For Ameren Missouri, refer to **General Rules and Regulations in Ameren Missouri** for additional information.

100.08 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 prorate reduction of the monthly charges. Refer to **Customer Terms and Conditions** for additional information.

100.09 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.

100.10 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 in Illinois**. The Company may agree to provide service through multiple delivery points as described in the **Special Facilities** section of the **General Rules and Regulations for Electric Service in Missouri**.

100.11 ORIGINAL EQUIPMENT MANUFACTURER (OEM)

OEM, or “Original Equipment Manufacturer,” is a company that has the capabilities to design, develop, manufacture, and sell products themselves.

100.12 RELOCATION OF SERVICE

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.

100.13 PROCESS FOR REPLACEMENT OF INADEQUATE / FAULTY SERVICE EQUIPMENT; UPGRADING ENTIRE SERVICE INSTALLATION; OR PERFORMING WIRING MODIFICATIONS ON SERVICE

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

Ameren Missouri (Outside St. Louis City and St. Louis County) and all Ameren Illinois:

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**

In St. Louis City and St. Louis County:

Contractors may disconnect and reconnect customer's service ONLY when ALL 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 of 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.

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

- Call Ameren Missouri construction Services Hotline at **866-992-6619** (M-F, 7am to 5:30pm) to obtain approval; notification to be made within 24 hours of performing the intended work.
- Provide inspection permit number to Ameren Missouri.

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

Ameren Electric Service Manual (ASM): Company reference guide that facilities the planning and installation of electrical equipment in a safety and professional manner.

Ampacity: The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

Applicant: A person who applies for Residential or Non-Residential service and / or who requests an Extension. This would also include an entity / person who applies for a Distribution Generation (DG) / Distribution Energy Resources (DER) interconnection.

Bonding Conductor: The conductor that provides the electrical conductivity between metal parts that are required to be electrically connected.

Bypass, Clamp-Jaw Lever Type: A mechanical lever bypass is an integral component designed into the meter socket block assembly of a ring-less type meter socket. The lever action has two primary functions:

1. When the lever is downward in its default position, the mechanism provides jaw clamping forces to help secure the meter and make continuity to the meter spades while in normal operation.

2. When the lever is shifted to the upward position, into "bypass" mode, the mechanism releases the clamping pressure on the meter spades and diverts the current flow from the meter to the internal bypass. This allows for the exchange, inspection, or repair of a meter without service interruption to the customer. **Note: Meter socket cover cannot be reinstalled or sealed with lever handle in upward "bypass" position.**

Commission: The agency responsible for regulating the regulated portions of investor-owned public utilities.

- In Illinois, the Illinois Commerce Commission (ICC) or any duly constituted successor
- In Missouri, the Missouri Public Service Commission (PSC) or any duly constituted successor

Company: Either Ameren Illinois Company or Ameren Missouri Company, depending on the geographic location of the facilities to be installed.

Customer or Retail Customer: A person or legal entity receiving service at a premises or whose facilities are connected for utilizing services at the premises.

Delivery Voltage: The service voltage of Company's lines at the Point of Delivery.

Demand (Peak Demand): The highest average load in kilowatts (kW) during any 15-minute interval during the time between regular meter readings. There shall be four fixed 15-minute intervals per hour with the first interval beginning at the top of the hour as registered on the meter.

Distribution Generation (DG): See Distributed Energy Resources.

Distributed Energy Resources (DER): Systems that operate in parallel with Ameren supply such as photovoltaic, wind, energy storage systems (ESS) such as battery or flywheel, diesel / natural gas or other technologies.

Distribution System: Distribution System, for purposes of determining Line and / or Service Extension applicability, means those poles, wire, and other equipment used to distribute electricity either overhead or underground at 34kV or less for Illinois and Missouri.

Energy Storage System (ESS): A subcategory of DER. Batteries are the most common form of equipment under this DER category.

Electrical Metallic Tubing (EMT): An unthreaded thin-walled raceway of circular cross section designed for the physical protection and routing of conductors and cables and for use as an equipment grounding conductor when installed utilizing appropriate fittings. EMT can't be used for supporting meter structures or for making service drop terminations above the roof line.

Electrical Nonmetallic Tubing (ENT): A nonmetallic, pliable, corrugated raceway of circular cross section with integral or associated couplings, connectors, and fittings for the installation of electrical conductors.

Ground: A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

High Rise Development: A commercial / residential structure which may contain a mixture of both class of tenants, consisting of 4 or more floors that may have grouping of tenant meters in electrical rooms found on multiple floors.

Illinois Commerce Commission (ICC): See Commission

Line (Supply) Side Tap for DER: A tap made where the DER Point of Interconnection (POI) is located electrically after the revenue metering equipment but before the main service disconnecting means.

Load Side Tap for DER: A tap made for adding DER to a secondary or primary rated service installation where the Point of Interconnection (POI) is located electrically after the main service disconnect.

Local Inspection Authority and Authority Having Jurisdiction (AHJ): As it pertains to this document, the agency responsible for the inspection of a customer's electrical installations. This authority can be an agency of an incorporated City, Town, Village, or of the County, State, or Federal Government. The Ameren Companies are not inspection authorities. In service areas void of inspection authority, Customer service installations must conform to Ameren Electric Service Manual standards and the current National Electrical Code (NEC), and other applicable codes.

Meter Disconnect: A safety switch that is located on the line side of a 480Y/277V, 480/240V, or 480V system. The disconnect must be a knife blade switch without overcurrent protection (OCPD).

Meter Socket, Self-Contained: The mounting device consisting of jaws, connectors, and enclosure for socket type meters where no CTs or PTs are used.

Meter Socket, Instrument Transformer Rated: The mounting device consisting of jaws, connectors, and enclosure for socket type meters where CTs and / or PTs are used.

Metering Instrument Transformer, Current (CT): A device that precisely steps down the current from its primary current to a workable current that can be measured with conventional meters.

Metering Instrument Transformer, Potential (PT): A device that precisely steps down the voltage from its primary voltage to a workable voltage that can be measured with conventional meters.

Missouri Public Service Commission (PSC): See Commission

Multi-Tenant: (Illinois applications) A multiple occupancy building with three or more Customers who each qualify for the Residential rate or two or more Customers who each qualify for a non-Residential rate or buildings with one commercial and one residential service.

Multiple-Occupancy Dwellings: (Missouri applications) structures for permanent occupancy of 2 or more single-family residences.

National Electrical Code (NEC): This is the code document that governs building and premise wiring.

National Electrical Safety Code (NESC): This is the code document that governs electric and communication utilities.

Permission to Operate (PTO): Company authorization granted to operator of DER systems to operate their systems after having undergone and successfully passed a Company supervised Witness Test.

Premises: A contiguous tract of land separated by nothing more than a highway, street, alley, or railroad right-of-way, where all buildings and/or electric consuming devices located thereon are owned or occupied by a single Customer or applicant for electric service, or where all electricity delivered thereto is utilized to supply one or more buildings and / or electrical loads which the Company considers as components of a unified operation.

Rigid Metal Conduit (RMC): A threadable raceway of circular cross section designed for the physical protection and routing of conductors and cables and for use as an equipment grounding conductor when installed with its integral or associated coupling and appropriate fittings. **Galvanized Steel RMC** is permitted to be installed in all atmospheric conditions, in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences. **Aluminum RMC** is permitted to be installed where approved for the environment and were protected by corrosion protection when encased in concrete or direct contact with the earth. Both aluminum and steel RMC are permitted to be installed where subject to severe physical damage. Only **Galvanized Steel RMC** is allowed to be used for support of meter / service equipment structures and service riser masts extending above the roof.

Sequence, Cold Sequence Metering: An installation where a safety switch is located on the line side of metering equipment of a 480Y/277V, 480/240V, or 480V system. The safety switch must be a knife blade switch without overcurrent protection (OCPD).

Sequence, Hot Sequence Metering: An installation where a breaker, fused disconnect, or pull-out type fused switch is located on the load side of the metering equipment and where there is no safety switch on the line-side of the meter.

Service: As used in this document, service refers to the conductors connecting a point of delivery to the utilization voltage of the electric distribution system serving the customer.

This definition should not be confused with the Illinois tariffs, which define Service Extension, for the purpose of calculating Extension charges, as the portion of the extension, dedicated to the Customer, on Customer's Premises, regardless of voltage.

Service Equipment: The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

Surge Protective Device (SPD): A device designed to protect electrical equipment from voltage spikes by blocking or shorting to ground any unwanted voltages above a safe threshold.

Underwriters Laboratories Inc (UL) and Intertek Testing Services (ETL): Ameren approved equipment testing laboratories for the equipment used and installed in accordance with the listing and labeling instructions.

"Visible Open" Disconnect: A knife blade safety switch that may or may not have fuses, or a manually operated circuit breaker that plainly indicates whether in the open (OFF) position or closed (ON) position. (Refer to **ASM Sections 1400 and 1500**).

Witness Test: A testing procedure where DER systems are conducted by the Utility to ensure these systems meet certain established criteria prior to granting PTO.

200.01 METERING EQUIPMENT INSTALLATION REQUIREMENT

1) The customer shall provide a suitable place for the installation of metering equipment.
   a) The equipment shall be installed on the outside wall of the customer's building or approved metering structure and be so located that adequate space and unobstructed access is provided to the Company's representatives for reading, testing, maintaining, and exchanging of such equipment.
   b) In flood areas, the bottom of the meter device shall normally be raised above the highest water line on record. In Illinois, one level residential not raised up on an elevated structure, the maximum height required is 78 in. However, the Illinois customer has the option to build an elevated meter structure that conforms to the standards for non-residential. In Missouri, residential are treated the same as non-residential. For non-residential if necessary to raise above 78 in. from grade shall have a permanent platform with permanent ladder / stairs installed and maintained at the meter by the customer for access, see **ASM Section 100**. Elevated structures must be constructed to meet Ameren standards and one of the following as outlined in **ASM Section 100**: International Building Code, International Residential Code, or Occupational Safety and Health Administration.
   c) The customer shall consult the Company regarding the proper location of the equipment.
2) Metering equipment shall not be located on Company owned poles or on buildings adjacent to driveways, alleys, streets, or other similar exposed places where it can be damaged by moving vehicles unless the equipment is protected by a substantial guard rail or posts. The customer shall consult the Company representative in regard to providing adequate protected barrier. **Nor shall** any portion of the metering equipment be located below, above, or within:
   a) 3 ft. radius of a gas regulator relief vent associated with a gas meter set as shown in **ASM Figure 200-4** (with noted exceptions). For more details refer to the National Fuel Gas Code.
   b) 6 ft. to any electric motor, generator, belt, or other moving machinery.
   c) Other hazards which would endanger the safety of those reading or working on metering devices.
   d) Location must also satisfy **NEC Article 110.26**, clear working space around meter, as described below in **ASM Section 200.01.3** and illustrated in **ASM Figure 200-4**.
3) Clear working spaces shall not be used for storage.
   a) A minimum of 42 in. of clear working space shall be provided in front of all electrical equipment enclosures.
   b) There shall be a minimum working clearance of 6 in. above, below, and to each side of the metering equipment.
4) Metering equipment shall not be mounted on portable trailers, buildings, mobile home or manufactured (modular) homes, recreational trailers, or truck trailers; unless the manufactured (modular) home meets the conditions stated in the latest NEC.
5) Metering equipment must be installed in a workman like manner and firmly attached to the surface on which it is mounted.
6) All locations where metering equipment is installed shall have a minimum standing headroom of 78 in.

7) At locations where more than one meter is installed on any structure, the customer shall permanently mark all meter sockets and associated service equipment to identify the area and full street address for which each is installed. The location of the tenant is to match the identification of the premises or panel. Such marking must be made with metal letters, engraved plate, or other permanent methods with permanent adhesive. Any marking with stickers or sharpie will not be allowed.

8) Specific Ameren Illinois downtown areas of Bloomington, Champaign, Danville, Decatur, Galesburg, Normal, Ottawa, Peoria, and Urbana are designated as heavy underground that contain grid networks and spot networks. Service restrictions are specific to their corresponding area and Customer should consult Company to determine appropriate metering equipment prior to the beginning of customer engineering or purchasing of equipment. See **ASM Section 1350** for more details.

9) For Ameren Missouri areas served by heavy underground and secondary network systems, refer to **ASM Section 1300** for special metering requirements.

10) Rules Defining Rewire Work and Meter Location on Existing Buildings

a) Rewire work is defined as electrical work that involves changes to customer owned service cables, service entrance conductors, meter socket, or service entrance equipment for any of the following reasons:

i) Relocation

ii) Replacement

iii) Ampacity changes

Rewire work shall include the updating of metering equipment and requires that all meters be installed and located in accordance with the requirements of the latest Ameren Service Manual.

Service entrance conductors are defined as the conductors between the terminals of the service equipment and the tap to the service drop, service lateral or secondary distribution.

Service equipment is defined as consisting of the circuit breaker(s) or switch(s) and fuse(s) and their accessories located adjacent to the meter or near the point of entrance of the supply conductors to a building and intended to constitute the main control and means of disconnect from the supply.

b) Additional Service Entrances:

i) On existing residential buildings of 15 meters or less (on three occupied floors or less), additional service entrance conductors and / or an increase of ampacity requires all meters to be relocated outdoors per the meter location policy.

ii) On existing residential buildings exceeding 15 meters (on three occupied floors or less), if additional service entrances are wired to the building, meters associated with the new services shall be located outdoors if there are 15 or less meters per additional service entrance. Exception: If the total of existing and new meters exceeds 15 and all meters and services are in one approved location, meters may remain indoors.

c) Rewire exceptions:

i) In multi-tenant buildings of six units or less, with indoor meters, where all units are served from a common service and each unit has its own means of disconnect, the ampacity of the tenant disconnect, or the main service disconnect may be increased without relocating the meter(s) outdoors subject to the limitation of the service entrance conductor ampacity. Work to increase the service entrance conductor ampacity; however, is rewire work and requires all indoor self-contained meters on the service to be relocated outdoors.

ii) The CTs for rewired 800 amperes services may be left indoors if the rewiring can reuse the existing CT enclosure, which must meet current Ameren specifications. Appropriate CTs shall be installed. The meter will be located outdoors.

d) Supplemental Guidance on Existing Self-Contained Meter Socket Installations:
This section provides further clarifications regarding when a clamp-jaw lever bypass meter socket may or may not be required for existing electrical service installations. The following scenarios reference existing non-clamp-jaw lever bypass meter socket installations that need planned maintenance or replacement. In all cases, final determination and approval is requirement by the local Ameren personnel.

1) Single Self-Contained Meter Installation (e.g., not gang-metered):

a. When a meter socket is reasonably repairable with original equipment manufacturer (OEM) equipment (e.g., meter socket lug replacement), Ameren ***may*** allow for the existing meter socket to be repaired and not require replacement with a clamp-jaw lever bypass device.

b. When a meter socket is not reasonably repairable in which functionality and / or safety is compromised, the customer must replace the meter socket with a clamp-jaw lever bypass device.

c. When a customer is replacing the main breaker / panel only with the same ampacity (e.g., replacing old 200A with new 200A panel):

i. Outdoor Metering

1. **Ameren Missouri *may*** allow for the existing non-clamp-jaw lever bypass meter socket to remain, if the device (1) is in good working order, (2) meets local inspection authority requirements, and (3) is approved by Ameren Missouri.

2. **Ameren Illinois** requires the customer to update self-contained metering equipment that does not include a horn-bypass or lever-bypass meter socket (e.g., a ring-type meter socket). Replacement of horn-bypass or lever-bypass meter sockets for rewire work ***may*** still be required depending upon Ameren's field evaluation of the meter socket's condition.

ii. Indoor Metering: Existing indoor meter installation being rewired by a customer must be relocated outdoors as defined in this ASM section. This requires a clamp-jaw lever bypass meter socket as defined in **ASM Section 1000** to be installed.

Exception: In limited circumstances on non-residential services, the Division / Region Supervising Engineer and / or Metering Supervisor may grant approval, allowing the continued use of the existing non-clamp-jaw lever bypass meter socket in its existing location.

d. When a customer is upgrading the main breaker / panel (e.g., Increasing the ampacity of the main disconnect, such as from 100A to 200A), the customer must replace the meter socket with a clamp-jaw lever bypass device located outdoors.

2) Gang-Metered Installations:

a. When a single meter socket must be replaced due to damage or failure, Ameren may allow for the meter socket to be replaced with a matching socket although it may not have any bypass capability. (Note: Ameren recognizes that for gang-metered installations (or meter centers) it may not be necessary to replace the entire service installation if only one of the meter sockets needs replacement). Replacement must be original equipment manufacturer (OEM) equipment.

b. When 2 or more-meter sockets must be repaired or replaced due to damage or failure, Ameren will require the customer to replace the entire gang-metered installation (or meter center) with a clamp-jaw lever bypass meter center, and the replacement must be original equipment manufacturer (OEM) equipment.

3) Inactive Accounts

a. **Ameren Missouri** - if a non-clamp-jaw lever bypass meter socket is in good working order both from a functionality and safety perspective, Ameren Missouri may allow an existing non-clamp-jaw lever bypass meter socket to be used even if the customer's account has been inactive for a period of six conservative months or more with approval from the local Ameren office and / or Metering Department.

b. **Ameren Illinois** - if a horn bypass or clamp-jaw lever bypass meter socket is in good working order both from a functionality and safety perspective, Ameren Illinois will allow the existing meter socket to be used even if the customer's account has been inactive for an extended period.

4) Emergency Replacement of Service Equipment - When service equipment fails and requires an immediate replacement (customer out-of-service), Ameren will allow the service equipment to be replaced without requiring the meter socket to be upgraded to a clamp-jaw lever bypass provided the meter socket is in good working order from a functionality and safety perspective.

200.02 INDOOR METER CRITERIA

Note: <u>Indoor metering will only be allowed in LIMITED SITUATIONS</u>. All requests for INDOOR self-contained and instrument rated metering installations must be evaluated and approved by Ameren Field Metering Supervisor and Field Supervising Engineer on a case-by-case basis.

1) **General Requirements**

a) In exceptional cases where it is physically impractical to make outdoor installations, as in the case of large apartment houses or where there is no suitable outdoor location, meters may be installed indoors, with Company approval.

b) Meters shall be mounted on a rigid wall or panel which is free from vibration.

c) Meters shall be in a clean, dry, and safe place as near as practical to the point where the service entrance enters the building.

d) Meters shall not be in sheds, attics, bedrooms, living rooms, bathrooms, restaurant kitchens, stairways, ventilating shafts, closets, coal bins, coal furnace rooms, or in any location where the visits of Company employees will inconvenience either the customer or the employee.

e) Meters shall not be in basements or in other locations which are not accessible by permanent stairs. A ladder cannot be accepted as a substitute for stairs.

f) Meters and service equipment installed indoors for a multiple-occupancy building, shall be grouped in an accessible public space where the Building Management and Ameren Representatives always have access. If the meter room(s) is locked and a key is not readily accessible from the customer, Ameren will provide a key lockbox for customer to mount adjacent to the access door. The Ameren lockbox stock number is 22 13 066.

g) In cases where there are several floors and several customers on each floor, thus making it impractical to locate the meters in one location, the meters may, with Company approval, be grouped in an accessible public space on designated floors.

h) **In Ameren MO**, indoor installation for smart metering will depend on the type of building approval (easement or lease) Ameren has secured and uploaded to the Real Estate Management System (REMS). Indoor installation of the Network Gateway/Router will consist of running a 1-1/2 in. conduit from the device located preferably in the meter room (but not limited to this location) to a Hoffman 6 in. x 6 in. box (part # AHE6x6x4 or comparable) for direct power. If the device is in a building that has a dedicated outlet that is inaccessible for use to building personnel, this is also an acceptable method to power the device.

i) **In Ameren IL**, for new building construction or renovation, every electrical room that has indoor metering sockets must have a dedicated 20 amperes power outlet served from a dedicated circuit with overcurrent protection installed at no cost to Ameren by the building owner. The outlet shall provide a 120 volt source for AMI equipment. This outlet must have a lockable in-use cover and be located above the bank of meters and within 3 ft. of the ceiling. This outlet must be labeled as “Ameren Use Only”. For existing buildings, Ameren IL will provide meter socket adapters, where required, to provide a 120 volt source for AMI auxiliary equipment. An AMI network device, such as a collector, will be mounted on the wall near the ceiling and adjacent to the dedicated power outlet in locations where AMI signal strength is weak. New construction also requires the customer to install a 1-1/2 in. schedule 40 PVC conduit in a ground floor or basement electrical meter room(s) from the Ameren dedicated power outlet to an exterior wall where a Hoffman 6 in. x 6 in. box (part # AHE6x6x4 or comparable) is mounted at ladder height. This conduit will be utilized when an AMI antenna needs to be installed outdoors for network connectivity.

Where an AMI device, other than a meter, is installed inside the building or on an exterior wall, an agreement must be prepared by Ameren and jointly entered with the building owner. This agreement is referred to as a Wireless Telecommunications Device License or Wireless Telecommunications Device Lease, depending upon the circumstance. This agreement is secured by the local Ameren Real Estate Agent and entered into the Real Estate Management System (REMS), in addition to being recorded at the appropriate county courthouse records department. Since this agreement is required only because of allowing some revenue meters to be installed indoors in special metering situations at the request of the building owner, no compensation to the building owner for energy consumption to support these AMI devices or for usage space allocation shall be made by Ameren or it's assigns.

j) If a customer makes additions or rearrangements to his building which result in metering equipment being located or enclosed in a location unacceptable to the Company, the customer shall relocate metering equipment and service entrance at his expense within 30 days of written notification.

2) **Specific Installations**

These situations are:

a) In designated underground areas of **Ameren Missouri**, such as Downtown St. Louis and Clayton, if supplied from indoor transformer rooms or network manholes or vaults, refer to **ASM Section 1300** for more details.

b) In designated underground areas of **Ameren Illinois**, if supplied from indoor transformer rooms, network manholes or vaults, refer to **ASM Section 1350** for more details.

c) General Service Rate (Non-residential) CT enclosure for underground services and CT enclosures for overhead services greater than 800 amperes, if approved by Field Metering Supervisor and Field Supervising Engineer, may be located indoors. For such installations, provisions must be made by the building owner for immediate doorway access to the service equipment room from the outdoor meter location. Any variances from this policy must be approved by the Field Metering Supervisor and Field Supervising Engineer. CT enclosures for overhead services 800 amperes or less and all residential services shall be located outdoors. The associated meter socket for all CT rated meters shall usually be mounted outdoors unless approved indoors by Field Metering Supervisor and Field Supervising Engineer.

d) Multiple Occupancy Buildings:

1) Residential Service Rate - three (3) occupancy floors or less with sixteen (16) or more meters per service allowed indoors. Fifteen (15) or less meters per service must be located outdoors.

2) General Service (Non-residential) Rate - three (3) occupancy floors or less with seven (7) or more meters per service allowed indoors. Six (6) meters or less per service must be located outdoors.

3) Combination Residential and General Service Rate (Non-Residential) - three (3) occupancy floors or less with seven (7) or more meters per service allowed indoors. Six (6) meters or less per service must be located outdoors and on the ground-level floor.

e) Primary metering - Only if approved by Field Supervising Engineer and Field Metering Supervisor.

f) Outdoor locations that may subject the metering equipment to physical harm.

g) If the metering equipment is permitted to be installed indoors which meets the above criteria, the Customer / Contractor must provide the detailed location, access, wiring methods on the line-side of metering equipment, and security provisions to meet the requirements of the latest Ameren Service Manual. The information must be submitted to the Ameren project contact and must be approved by the appropriate Field Supervising Engineer before wiring work is started.

200.03 INSTALLATION

1) The customer shall furnish and install, at customer's expense, all necessary service entrance facilities.

2) All metering equipment shall be fastened in place with corrosion resistant (galvanized or stainless steel) screws.

3) Anchoring to supply adequate support shall be used on brick, tile, or other types of masonry buildings.

4) Where necessary on hollow tile walls, corrosion resistant (galvanized or stainless steel) toggle bolts may be used.

5) Meter boards no less than ¾ in. thick shall be installed by the customer on indoor locations where plastered walls and other direct mounting surfaces are of insufficient strength.

6) Use of sheet rock style screws will not be accepted as fasteners for service entrance equipment on any installation.

7) All fasteners and straps must be of adequate size and material to rigidly secure the equipment to the structure.

8) All metered and un-metered conductors shall be separated by barriers or in separate raceways.

9) Line or service entrance cable, conduit or bus duct shall enter the hubs of meter sockets and transformer enclosures on all overhead service installations, except where a customer's main line switch or a junction box is installed on the line or source side of the metering equipment.

10) All unused openings of service equipment and metering sockets shall be closed with internally secured hub plugs or plates to afford protection nearly the same as the solid wall of the cabinet or enclosure.

11) Insulated splicing wire connectors, commonly referred to as twist caps or wire nuts, shall not be used on service entrance conductors.

12) Lock nuts and bushings shall be used where conduits enter the back, bottom or side knockouts of sockets or enclosures.

13) Inhibitor is required on service conductors at meter socket terminators if unlike materials are used.

14) The neutral conductor shall be identified with one of the following methods:

    a) A conductor with continuous white or gray covering

    b) A conductor with three continuous white or gray stripes on other than green insulation

    c) A marking of white or gray color tape at its terminations during the time of installation

15) Grounded delta 3-phase sockets require high leg / wild leg to be placed in the right-hand position at the meter socket, and this conductor will be marked orange in color. The high leg (also referred to as the wild leg) will terminate in the middle position on the customer main service disconnect, except in panel boards / switchgear arrangements, ahead of and beyond metering compartments.

16) Above grade, unmetered service entrance conductors must be run in a continuous conduit system. (An exception would be type SE cable.) LB's, troughs, or any other connectors that do not have provisions for Company seals or installation of tamper proof screws that would allow access to un-metered conductors on the supply side of Ameren metering equipment (e.g., CT enclosure or self-contained meter socket) are not permitted without specific approval from the Field Metering Supervisor and Field Supervising Engineer.

200.04 SELF-CONTAINED METERING INSTALLATIONS (REFER TO ASM SECTION 1000 FOR ADDITIONAL INFORMATION)

1) 200 amperes max:

   A. Single-phase 120/240 volts; 120/208 volts, 3-wire, grounded neutral (network metering); 3-phase 3-wire 240 volts; 3-phase 4-wire 240/120 volts; and 3-phase 4-wire 208Y/120 volts

   B. Single-phase 240/480 volts; 3-phase 3-wire 480 volts; and 3-phase 4-wire 480Y/277 volts

      a) Meter disconnect (safety switch) located on the line side of the meter (cold sequence metering) is required for 480Y/277 volts and 480 volts 3-phase services and 480 volts single-phase services rated 200 amperes max. Meter disconnect (safety switch) shall be lockable or under a lockable door. Ameren will maintain the meter disconnect (safety switch) as closed and locked. Customer shall permanently mark the meter sockets to identify 480 volts, and such marking shall be made with metal letters, engraved plate, or other permanent methods using permanent adhesive. Stickers and sharpie will not be allowed. Customer will maintain ownership of equipment. Label this device as “Meter Disconnect - Not Service Equipment” per **NEC 230.82**.

b) If local inspection authority or the load of the fire pump and protection equipment require more than a 200 amperes service, then a CT / PT enclosure must be used (e.g., 320 / 400 amperes meter socket not allowed) as described in **ASM Section 1001.02**. If the service to the fire protection equipment can be sized at 200 amperes or below, then Ameren will still require a meter disconnect in front of the meter socket.

c) Ameren should be contacted to determine available short circuit current.

d) Use of separate enclosures for the line side meter disconnect (safety switch) and the meter socket is acceptable. However, they must be mounted directly above, or on a horizontal plane, within 4 feet of one another.

e) Continuous conduit is required with no LB's or any other connector that could allow access to un-metered wiring between the meter disconnect (safety switch) enclosure and meter socket.

f) Sealing provisions for the line side meter disconnect (safety switch) must be provided to prevent access to un-metered conductors within this enclosure.

g) The meter disconnect (safety switch) shall be provided by the customer and secured with a pad lock by Ameren for Company use only.

2) 201-400 amperes:

A. Single-phase 120/240 volts; 3-phase 3-wire 240 volts; 3-phase 4-wire 240/120 volts; and 3-phase 4-wire 208Y/120 volts

a) The use of K-base meter socket will not be allowed on new service installations.

b) Self-contained meter sockets rated at 320 amperes continuous / 400 amperes max are normally required for this ampere range.

c) The customer installed main service disconnect (overcurrent protection device) must limit the total continuous load current (defined as 3 hours or more by NEC) to 320 amperes. This is ONLY accomplished by installing one of the following options with Standard Rating of 80%:

i) One 400 amperes non-adjustable breaker

ii) Two 200 amperes non-adjustable breakers

iii) One 400 amperes fuse-switch combination

iv) Two 200 amperes fuse–switch combinations

d) If customer load requires 400 amperes continuous duty service, then the customer must install instrument rated (CT / PT) metering equipment.

B. Single-phase 240/480 volts; 3-phase 3-wire 480 volts; and 3-phase 4-wire 480Y/277 volts

a) This option will only be considered by Ameren if there is insufficient room for a standard CT / PT metering installation. This would require a meter disconnect (safety switch) in front of the meter. This non-standard self-contained service installation must have approval by both Ameren Field Metering Supervisor and the Field Supervising Engineer.

200.05 INSTRUMENT TRANSFORMER CT / PT RATED METER INSTALLATIONS

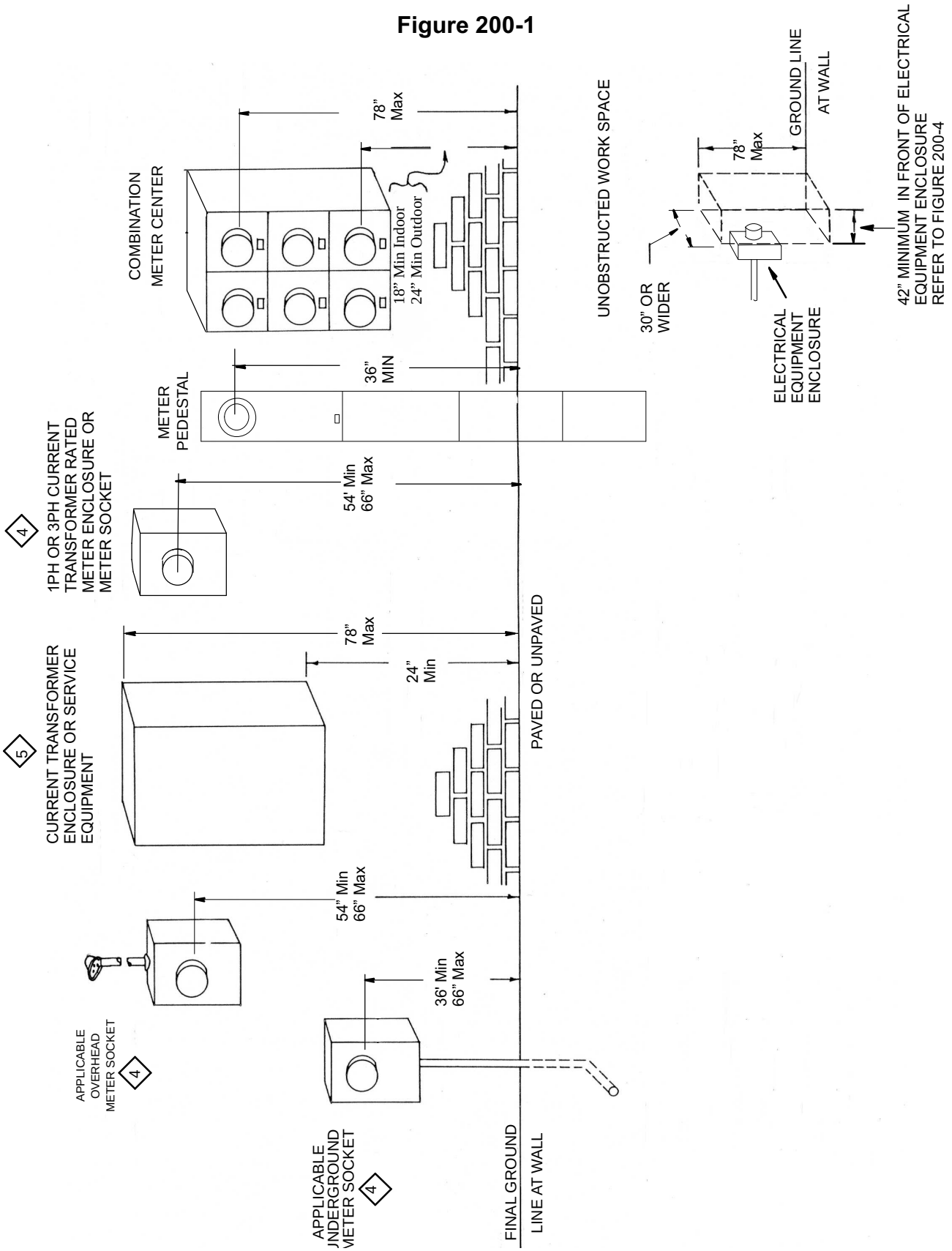
For voltage and current combinations not covered in **ASM Section 200.04,** refer to **ASM Section 1001.**

200.06 DRAWINGS

Figure 200-1	METER MOUNTING HEIGHTS
Figure 200-2	CUSTOMER PROVIDED AND INSTALLED PROTECTIVE BARRIER – METER EQUIPMENT
Figure 200-3A	LOCATION FOR POINT OF DELIVERY ON BULIDINGS IN **AMEREN ILLINOIS**
Figure 300-3B	LOCATION FOR POINT OF DELIVERY ON BUILDINGS IN **AMEREN MISSOURI**
Figure 200-4	ELECTRICAL AND GAS EQUIPMENT ON SIDE OF HOUSE OR COMMERCIAL BUILDING

METER MOUNTING HEIGHTS

Figure 200-1



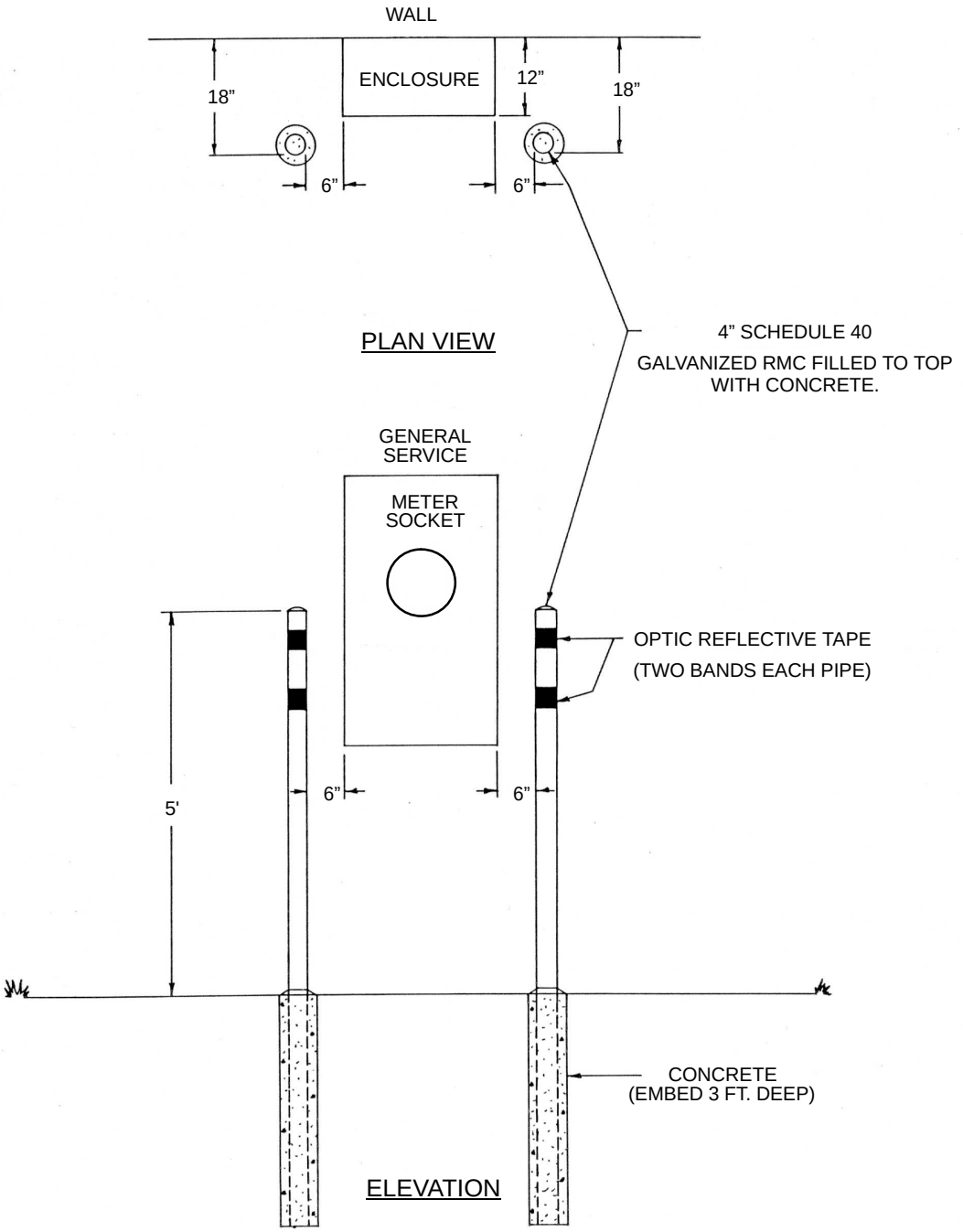
METER MOUNTING HEIGHTS
Figure 200-1

CONSTRUCTION NOTE(s):(FIGURE 200-1)

1. If meter is subject to mechanical damage, vehicular traffic, or presents hazard to the public, the customer / contractor shall install protective barrier.
2. Ground slope at wall shall not exceed 4” in 12” in any direction.
3. Meters shall be mounted outdoors unless special permission has been granted for indoor mounting by Ameren.
4. Center of the meter glass shall be at a height of 54 in. to 66 in. above grade.
   Exceptions:
   A. When a meter base is over walkways less than 36 in. wide or in areas where flooding occurs, the center of the meter glass can be 78 in. above walking surface.
   B. For Missouri Only, underground fed residential service installations that are mounted on the side of a single family dwelling unit are allowed to be at 36 in. to the center of the meter glass.
   C. When a service installation consists of a meter pedestal, the center of the meter glass must be 36 in. or greater.
   D. CT cabinets shall be located outdoors for all residential service rated installation.

CUSTOMER PROVIDED AND INSTALLED PROTECTIVE BARRIER METER EQUIPMENT

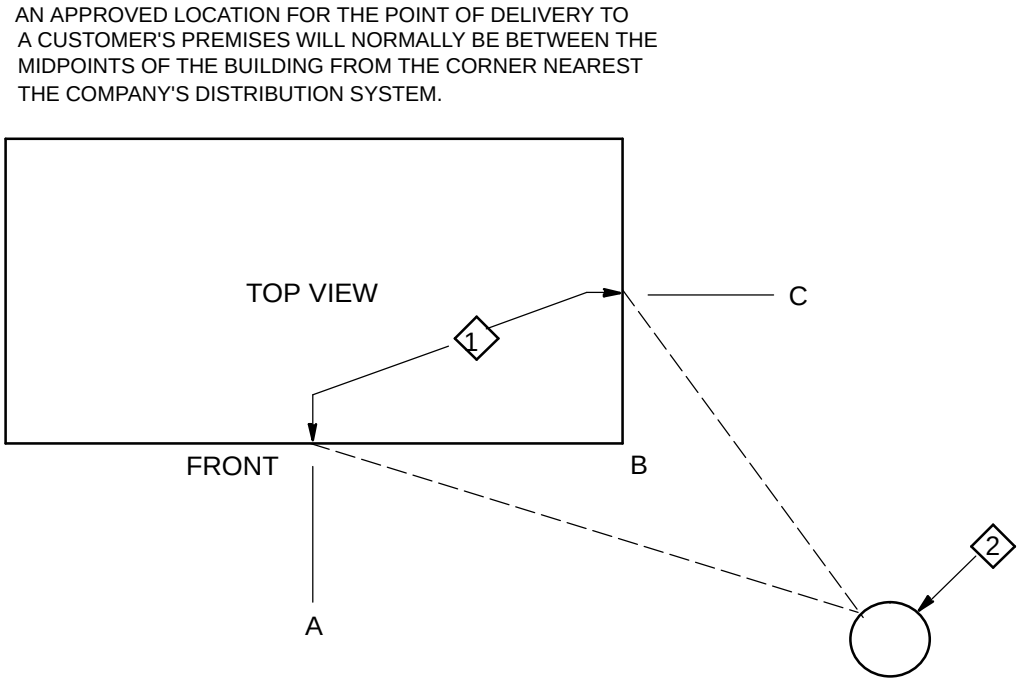
Figure 200-2



CONSTRUCTION NOTE(s): (FIGURE 200-2)

1. Alternative barriers include:
   A) Wall supported bracket for public safety.
   B) Concrete curbs for vehicular barrier.

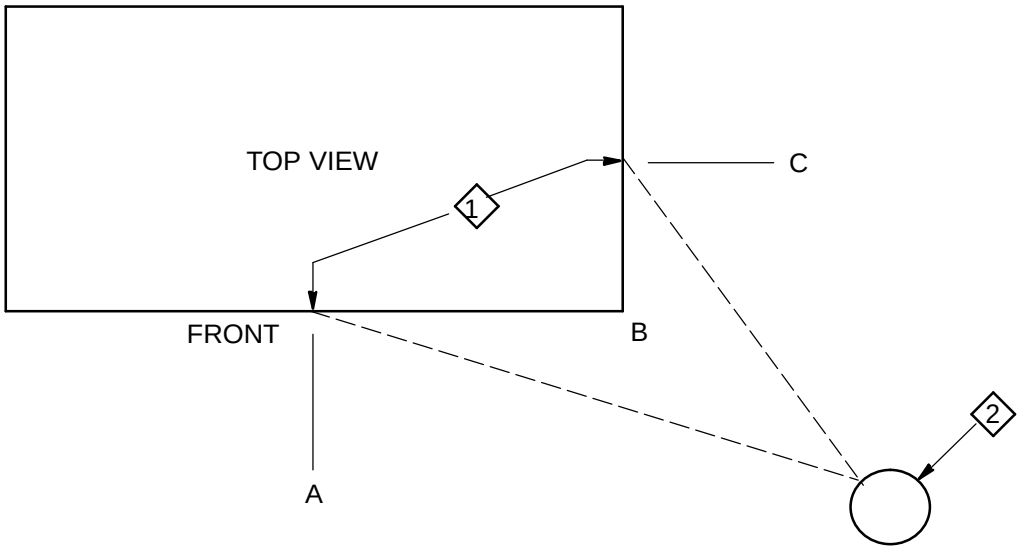
LOCATION FOR POINT OF DELIVERY ON BUILDINGS IN ILLINOIS
Figure 200-3A



CONSTRUCTION NOTE(s): (FIGURE 200-3A)

1) These guidelines apply to Ameren Illinois only.
2) In Illinois, 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 600-6** and **ASM Section 200.01**.
3) In Ameren Illinois, all new standards residential and standard non-residential services will be 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.

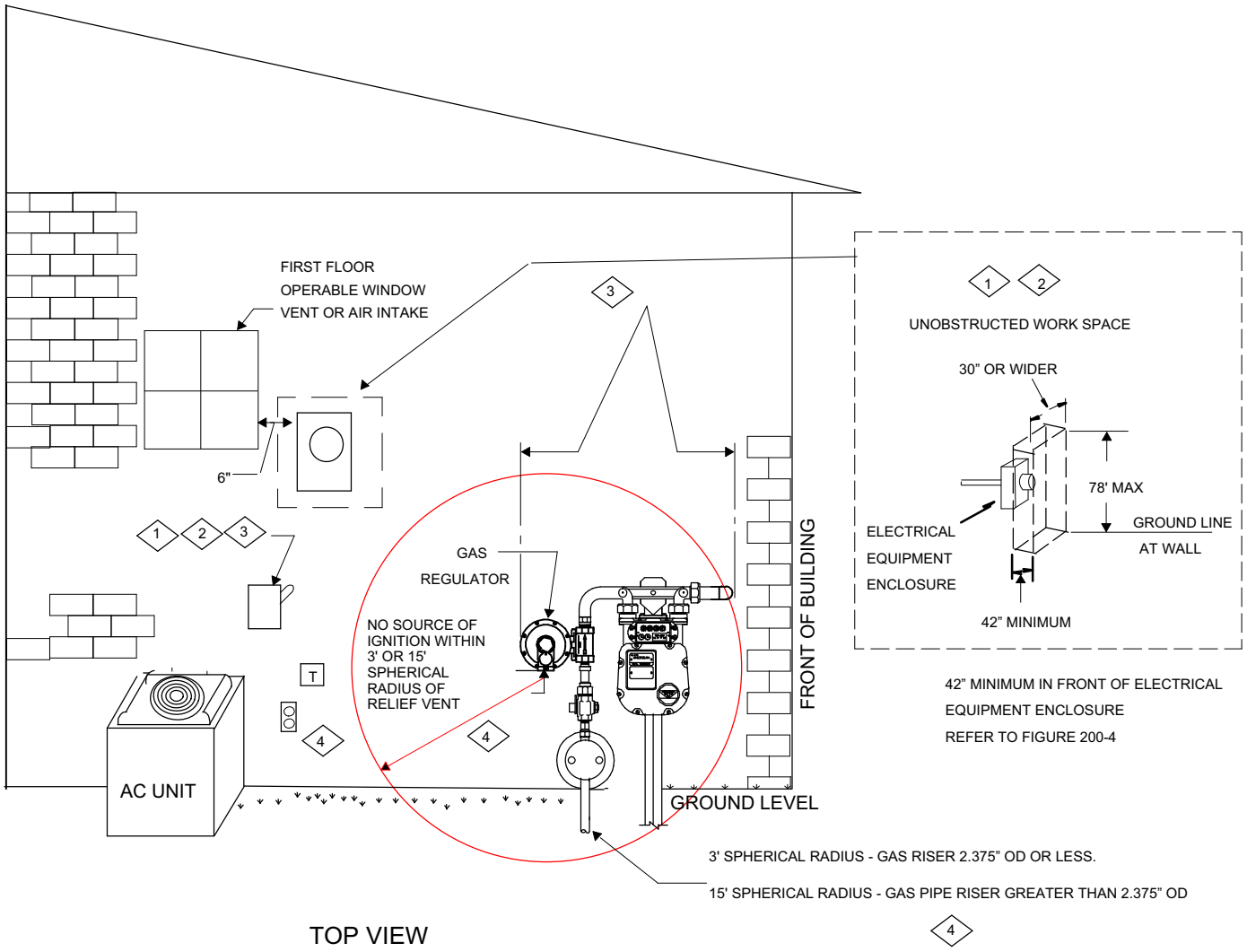
LOCATION FOR POINT OF DELIVERY ON BUILDINGS IN MISSOURI
Figure 200-3B



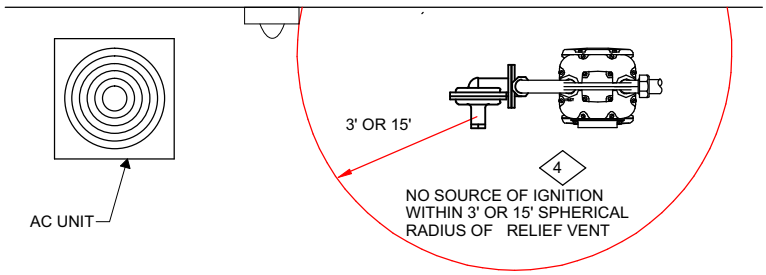
CONSTRUCTION NOTE(s): (FIGURE 200-3B)

1) In Missouri, an approved location for the point of delivery to a customer's premised will normally be within 10' of nearest corner front or side of the home if proper clearance can be maintained to the service connection on the front or side of the home where possible.
2) 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 600-6** and **ASM Section 200.01**.
3) In Ameren Missouri, distribution point from Ameren System may be overhead or underground.
4) Applicable charges are governed by State tariffs. Contact your local Ameren Representative for an explanation of charges that may apply.

ELECTRICAL AND GAS EQUIPMENT LOCATED ON SIDE OF HOUSE OR COMMERCIAL BUILDING
Figure 200-4



TOP VIEW



ELECTRICAL AND GAS EQUIPMENT LOCATED ON SIDE OF HOUSE OR COMMERCIAL BUILDING
Figure 200-4

CONSTRUCTION NOTE(s): (FIGURE 200-4)

1. Depth of working space in front of energized electrical equipment shall not be less than 42” per **NEC 110.26 A(1)**.
2. Width of working space in front of energized electrical equipment shall be the width of the equipment or 30”, whichever is greater and shall permit 90 degree opening of equipment doors or hinged panels per **NEC 110.26 A (2)**.
3. Height of Working Space shall extend from the grade, floor, or platform to a minimum of 78” per **NEC 110.26 A(3)**. Further clarification: No electrical equipment such as but not limited to metering equipment, disconnects, and solar inverters shall be located above or below fixed objects such as but not limited to gas meters, air conditioners, and standby generators.
4. No source of ignition from electrical equipment such as but not limited to metering equipment, disconnects, receptacles, and solar inverters shall be located within a 3 ft. spherical distance from the Gas Relief Vent on Gas Pipe Risers with 2.375" OD or less as measured on bare pipe. For Gas Pipe Risers with greater than 2.375" OD as measured on bare pipe, the required spherical distance is 15 ft. Refer to **National Fuel Gas Code 5.14**, Ameren Gas O & M Plan, and American Gas Association Catalog # XL1001.

300.01 CUSTOMER'S SERVICE EQUIPMENT

1. The location of the main service disconnect shall be located either adjacent to the metering installation or at the nearest point of entry on the building or structure. Where two to six main service disconnects are permitted, they shall be grouped together. If the nearest point of entry is not readily accessible, the main service disconnect(s) must be located outdoors and shall be of NEMA type 3R weatherproof construction.
   A. Exception 1: One of the two to six main service disconnects can be located remotely if it only serves a water pump also intended to provide fire protection.
   B. Exception 2: Main service disconnects that serve fire pumps, emergency systems, legally required standby, or optional standby services shall be located remotely from the one to six main service disconnects for the normal building service to improve reliability of power to important safety equipment or systems.
   C. Exception 3: Service disconnects associated with parallel power production systems or systems designed for connection to multiple sources of supply for the purpose of enhanced reliability may be located remotely from the one to six main service disconnects.
   D. Where multiple service disconnects serve a building or structure and a service disconnect(s) is located more than 10 ft. from the other service disconnect(s) or all service disconnects are not visible from one location, placards must be posted at each main service disconnect showing where the other sources of power to the building or structure are located.
2. In accordance with changes made in the **2020 NEC Article 230.85**, outside disconnects are now required for one- and two-family dwelling units. This change was implemented primarily based upon providing first responders an accessible, outdoor emergency disconnect or service disconnecting means in an emergency such as fire, gas leak, structural damage, or flooding. This allows emergency responders to de-energize the dwelling without having to enter the building and search for the disconnecting means which might be in the basements of some dwellings. This requirement enhances the safety of all emergency responders.
   Ameren requires this outdoor emergency disconnecting means to function as the service disconnecting means with built-in overcurrent protection. This outdoor service disconnecting means must be labeled per NEC as “Emergency Disconnect / Service Disconnect”.
3. Service equipment / main disconnecting means shall consist of either externally operable fused switches, dead-front panels with pullout fused disconnects, or manually operable automatic circuit breakers.
   A. Service equipment / main disconnecting means that have fused overcurrent protection less than the enclosure rating, shall have a permanent placard stating the enclosure rating and the max fuse trip in the form of XX AS / YY AT MAX FUSE (e.g., 100 AS / 80 AT MAX FUSE).
   Exception: If service conductor rating meets or exceeds that of the enclosure, placard is not required.

B. Service equipment / main disconnecting means that have circuit breaker overcurrent protection that has a trip rating or setting less than the enclosure shall have a permanent placard stating the enclosure rating and the max trip rating in the form of XX AS / YY AT MAX (e.g., 3000 AS / 2000 AT MAX).
Exception: If service conductor rating meets or exceeds that of the enclosure, placard is not required.

C. A & B are applicable to main disconnecting means as well as DER / DG and ESS disconnecting means that include overcurrent protection.

D. Placards shall be phenolic and when secured to the outer cover of the electrical enclosure shall be adhered using permanent adhesive. When the surface area of the electrical enclosure does not permit attachment, the placard is permitted to be adhered to a wall or immediately adjacent surface. Placards shall not overlay critical equipment information such as ON / OFF designations or equipment ratings and shall not overhang the surface of the equipment to which they are attached.

4. A building or other structure served by the Company shall be supplied by only one service which could be multiple runs of conductors connected at the supply end or connected at both the supply end and meter point. Allowed exceptions to this but not limited to:
   A. Fire pumps
   B. Emergency Systems
   C. Legally required standby systems
   D. Optional standby systems
   E. Parallel production systems
   F. Systems designed for connection to multiple sources of supply for the purpose of enhanced reliability
   G. Buildings or structures too large causing excessive voltage drop on customer distribution or demand greater than the Company can serve from a single point.

   For any of the above exceptions allowed per the latest edition of the NEC, these connections will be subject to Company approval. Contact Company during the engineering / planning phase to ensure the needs of Company and Customer will be met.

5. More than one disconnect or circuit breaker for the service equipment:
   A. The service equipment shall contain no more than six operative switch positions, and all shall be grouped together as allowed per **2020 NEC Article 230.71 (B)**:
      1) Separate enclosures with a main service disconnecting mean per enclosure.
      2) Panelboards with a main service disconnecting means in each panelboard.
      3) Switchboard(s) where there is only one main service disconnecting means in each separate vertical section where there are barriers separating each vertical section.
      4) Main service disconnects in switchboard or metering centers where each main service disconnect is in a separate compartment.
   B. No more than two service entrance masts per meter point location when served overhead, without prior Company approval.

6. **Main Service Disconnect(s)** serving native customer loads for an electric service must be grouped together. Where the main service disconnecting means is comprised of more than a single switch but not greater than six switches as allowed per NEC, each must be labeled "Main Service Disconnect" – 1 of the totals (i.e., 1 of 6). When a customer adds generation, these Lockable AC Generation Source Disconnect(s) must also be grouped together. This does not mean they have to be in the same room or located beside Main Service Disconnect(s). **The Lockable AC Generation Source Disconnect**(s) (not to exceed 6) are located outside, and the Main Service Disconnect(s) may be either inside or outside. As customers expand their Renewable Sources, they may also install an **Energy Storage System (ESS)**. ESS Disconnect(s) must also be grouped together (not to exceed 6) but may not be necessarily in the same vicinity as the Main Service Disconnect(s) and the Lockable AC Generation Source Disconnect(s).

   The label or placard found on these alternate generation and storage systems must state "**Lockable AC Generation Source Disconnect**" and "**Energy Storage System Disconnect**". In addition, where two to six Lockable AC Generation Source Disconnects and / or two to six Energy Storage System Disconnects exist, they must also be labeled as such (i.e.: 1 of 6).

   Where multiple sources of power (utility grid, parallel generation, energy storage system, and standby generation, etc.) serve a premises, and the associated service disconnects are located more than 10 ft. apart or not visible from one location, placards must be posted at each service disconnect showing where each source of power to the premises is located. Each category of service disconnects (categories include PV, ESS, main service disconnects, etc.) must be grouped together and visible from one location (each category must be on same side of wall and not separated by partitions).

   These placards shall be in the form of a site map (preferred) or a directory clearly listing the locations of each disconnect category. The placards or directories shall be permanently adhered to the front-facing surface of the disconnect(s), without overhang, or on the adjacent wall. When applied to electrical equipment, these can only be adhered using permanent adhesive (not screws or rivets). These placards or directories must be made of two layered engraved plastic (phenolic) material.

   This extensive labeling or placarding is required so that first responders (i.e.: homeowners, utility workers, emergency responders) can quickly identify all sources of power that supply a premises.

7. Equipment must be certified by an approved independent testing laboratory using the appropriate UL standard(s) for certification. At present Ameren recognizes UL (Underwriters Laboratories) and ETL (Electrical Testing Laboratories) as approved testing laboratories for equipment installed on the Ameren system.

8. Equipment being used as Service Disconnecting Means (Main Service Disconnect, AC Generation Source Disconnect, Energy Storage System Disconnect, Fire Pump Disconnect, etc.) must be labeled as “Suitable for Use as Service Equipment" (SUSE) or “Suitable Only for Use as Service Equipment.” See definitions in **ASM Section 150**.

9. The Customer or the Customer's representative is responsible for specifying disconnecting means rated and listed for the overcurrent, fault current (duty), and arc flash energy present at that specific location. Contact your local Ameren engineering representative for fault and impedance data available at the point of delivery.

** Disclaimer: The provided values are based on Ameren's current system configuration. Due to the dynamic nature of the subtransmission and distribution systems, the possibility exists for the values to change with future projects and maintenance work. The provided values do not account for other customer equipment on the system, only for Ameren owned equipment. Equipment must be appropriately selected to allow for potential future changes. Ameren is not responsible for re-engineering or re-sizing of customer's equipment.

10. Disconnects designed for vertical mounting will indicate “ON” when in the “up” position and “OFF” when in the “down” position. When in the “ON” position, the handle shall not exceed 6 ft. 7 in. above the floor or working platform.
11. A gang operated disconnecting means shall be located on the supply side of ALL fused service entrance equipment installations that simultaneously disconnects all ungrounded service conductors it controls from premises wiring systems.
12. The grounded circuit conductor shall not normally be switched or be protected with an overcurrent device. Exceptions are required for separately derived systems. All exceptions must be approved by Ameren.
13. In accordance with the **2020 NEC Article 230.67**, all dwelling units are now required to be provided with surge protection equipment. The surge protection device (SPD) must be an integral part of the service equipment or located immediately adjacent to the service equipment unless it is supplied at each next level distribution equipment downstream toward the load.

    Type 1 SPD is hardwired and permanently connected, without overcurrent protection, and located between the revenue meter and the line side of the main service disconnect overcurrent device.

    Type 2 SPD is permanently connected on the load side of the main service disconnect overcurrent device, including SPDs located at branch panels.

    Type 3 SPD is located at the point of utilization.

    Type 4 SPD is part of a component assembly in listed end-use products.

    Ameren does not allow customer owned Type 1 SPDs to be installed. A SPD(s) is required to be installed when service equipment is being replaced.
14. Ground-fault protection of service equipment shall be provided for solidly grounded wye electric services of more than 150 volts to ground but not exceeding 1000 volts phase-to-phase for each service disconnect rated 1000 amps or greater.
15. For ungrounded service, refer to **ASM Section 500** for special requirements.

300.02 UNAUTHORIZED USE OF DEDICATED SPACE FOR AMEREN EQUIPMENT

Meter sockets and metering equipment enclosures are not to be used as junction boxes or raceways for customer owned distribution circuit wiring or alternate power source(s) circuity and monitoring equipment. Only service entrance conductors are permitted in those enclosures. Once service entrance conductors leave the meter socket or metering equipment enclosure(s), they cannot re-enter the enclosure for any reason. Customer owned current transformers (CTs) and cabling used to monitor their loads and / or DER production output are not allowed inside the meter socket or metering equipment enclosure(s). Unauthorized wiring and equipment shall be removed by the customer at no expense to Company.

300.03 UNAUTHORIZED AFTERMARKET EQUIPMENT

Unauthorized Aftermarket Customer Owned Equipment including but not limited to surge protection device(s), alternative generator connections using insulated connectors (e.g., Polaris, NSI, or Self Piercing Hot Taps) associated with making POIs for DER and emergency/standby generator connections shall not be used in meter sockets, CT / PT Enclosures, or other Ameren equipment. Communication inter-system bonding attachments using clips / straps shall not be connected to the meter socket, CT / PT enclosure(s) or other Ameren equipment.

- Company standard service is 60 Hertz alternating current.

400.01 THREE-PHASE AVAILABILITY

Customers should contact the Company regarding the need for three-phase service prior to the purchase of equipment or construction of facilities. In outlying and residential areas where three-phase service is not readily available, greater than 7.5 horsepower single-phase motors ***may*** be permitted, but only with the prior approval of the Company.

Three-phase service is not normally available for residential customers.

400.02 STANDARD SERVICE VOLTAGES

1. Single-Phase

- 120/240 volts, 3-wire, grounded neutral, limited to 800 amperes maximum
- 240/480 volts, 3-wire, grounded neutral, limited to 400 amperes maximum when served from OH transformer and 200 amperes maximum when served from padmount transformer for specialized applications such as area lighting and irrigation systems.
- 120/208 volts, 3-wire, grounded neutral, limited to 200 amperes max (provide by 2 phases and neutral - sometimes referred to as network metering)

This voltage is derived from 3-phase 208Y/120 volts, 4-wire system, typically used to serve large multi-tenant residential locations.

2. Three-Phase

Where the Ameren primary voltage (transformer high side voltage) is 4.16 kV:

- 208Y/120 volts, 4-wire, grounded-wye, limited to 500 kVA* of utility peak demand
- 480Y/277 volts, 4-wire, grounded-wye, limited to 500 kVA* of utility peak demand

* Due to transformer primary fuse coordination considerations with substation protective devices, higher peak demands require approval by the Division / Region Supervising Engineer

Where the Ameren primary voltage (transformer high side voltage) is 12.5 kV or 13.2 kV:

- 208Y/120 volts, 4-wire, grounded-wye, limited to 1000 kVA of utility peak demand
- 480Y/277 volts, 4-wire, grounded-wye, limited to 2500 kVA of utility peak demand

Where the Ameren primary voltage (transformer high side voltage) is 34.5 kV:

- 208Y/120 volts, 4-wire, grounded-wye, limited to 750 kVA of utility peak demand
- 480Y/277 volts, 4-wire, grounded-wye, limited to 3000 kVA of utility peak demand

In all cases outlined above, the customer or their agent is responsible for reviewing the Customer Obligations in the Warranties and Disclaimer section along with **ASM Section 100**.

Ameren understands that NEC load calculations will sometimes exceed the maximum size transformer Ameren has to serve the calculated load. Ameren will work with the customer and their agents to determine what a realistic anticipated demand will be while also allowing for some amount of load growth.

In addition, the transformer's primary fusing must be taken into consideration for achieving proper coordination with substation protection devices. For these reasons, Ameren requests that Customer contact Ameren early in the Customer's design phase for any service greater than or equal to 1600 amperes at 208Y/120 or 800 amperes at 480Y/277.

400.03 NON-STANDARD THREE-PHASE SERVICE VOLTAGES

The Company is presently supplying service at other voltages and configurations throughout its service territory in Illinois and Missouri. Existence of service in a voltage type listed is not a guarantee of future availability for new connections or expansion of existing services. Customers are strongly encouraged to discuss changes in their equipment with the Company prior to the purchase of said equipment or changes in premise wiring. Non-standard services by their nature do not provide the well-balanced voltages required by modern electrical devices. Therefore, the Company discourages their use.

In areas of limited three-phase primary circuitry, or for other engineering reasons, the following delta voltages may only be available at the Company's discretion. It is the Company's sole discretion over whether this service is available to any new customer. Existing customers adding load, or any customer that may add load in the future will be required to take a standard service offering.

- 240 volts, 3-wire, corner-grounded delta, limited to 600 amperes maximum
- 480 volts, 3-wire, corner-grounded delta, limited to 600 amperes maximum
- 240 volts, 3-wire, un-grounded delta, limited to 600 amperes maximum (see requirement in **ASM Section 500.01**)
- 480 volts, 3-wire, un-grounded delta, limited to 600 amperes maximum (see requirements in **ASM Section 500.01**)
- 240/120 volts, 4-wire delta, grounded center tap, limited to 600 amperes maximum.

It is the Company's intent to limit the availability of these service voltage for the following reasons:

- Unequal loading of transformer coils which naturally occur with these connections and requires the de-rating of the transformers.
- The Company's cost associated with owning and stocking 3-phase padmount transformers at these voltages.
- Power quality issues that may occur depending on the combination of the customer's equipment, customer loads, and distribution system loading.
- Imbalance that can occur on the Company's distribution system because of these connection types.

For the reasons stated above, the following limitations are being placed on these non-standard service voltages which will be offered at the Company's discretion.

- Limited to 600 amperes
- In areas where 3-phase aerial primary is available, full-delta and open-delta service from overhead transformers may be provided. However, the customer may be required to take a wye service.

- In areas where 2-phase primary is available, open-delta service from overhead transformers may be provided.
- Open-delta service may be provided from two single-phase banked, padmount transformers or two single-phase, banked pole mount transformers. When this may be the case and 3-phase primary become available in the future, the customer will be required to upgrade to a wye secondary voltage if they require additional capacity. For this reason, the customer and their electrician should choose and configure their equipment so that future impact on the customer is minimized.
- No additional 3-phase padmount transformers at these voltages will be installed. If a transformer at an existing installation fails, service at this voltage will be maintained by the Company. The customer may be required to upgrade to a wye secondary voltage if they require additional capacity. For this reason, the customer and their electrician should choose and configure their equipment so that future impact on the customer is minimized.
- The Company reserves the right to provide 3-phase services from an open-delta installation to serve small 3-phase loads. One example would be a small lift station in a residential area.

Again, all non-standard voltages were not, and are not available in all areas served by the Ameren Companies. **Check with local Ameren contacts to verify the service voltage and configurations available.**

400.04 NON-STANDARD SERVICE AVAILABILITY

Request for amperages and / or configurations not specified above will be evaluated on a case-by-case basis. Company at its sole discretion may elect to provide non-standard service provided customer pays all excess costs or charges relating to providing the non-standard service.

Refer to **ASM Section 500** regarding un-grounded services.

400.05 PRIMARY DISTRIBUTION SERVICE 69 KV AND BELOW

Primary service is offered at voltages designated by the Company. Primary voltages are defined in the posted rates. Such a service is normally supplied by extending primary distribution lines to a substation or customer switchgear located on the customer's premises. The substation transformers may be Company or Customer owned. For engineering, economic, or other reasons, the Company may, in some cases, elect to supply primary service from a substation located on Customer Property. The Customer must submit the power requirements to the Ameren project contact and must be approved by the appropriate Supervising Engineer before purchasing equipment and wiring work is started with a minimum of nine months or longer due to lead time of material and complexity of the work prior to the desired in-service date.

The Company will provide primary metered service specifications specific to Ameren Illinois or Ameren Missouri requirements. This will provide detailed information pertaining to physical connection, overcurrent protection, gang disconnect, system metering, and other site requirements. For special circumstances such as primary metered locations in bottom ground that normally floods greater than 5 ft. deep, customer provided staircase and landing will be required to access elevated meter socket (see **ASM Section 100**).

500.01 GROUNDING REQUIREMENT

All **standard services** that operate below 1000 volts as defined in **ASM Section 400** shall contain a grounded neutral conductor.

A **non-standard** service that operates below 1000 volts as defined in **ASM Section 400** may have a grounded phase conductor used as a circuit conductor in the system.

The grounded neutral or grounded phase conductor is earth grounded at the utility transformer and is extended to the self-contained meter socket, CT enclosure, meter disconnect, and to each service disconnect in accordance with the latest edition of the NEC.

For underground systems, the service riser conduit(s) on the supply side of the customer's meter disconnect, self-contained meter socket, or CT enclosure shall not contain the grounding electrode conductor. If a customer chooses to secure / protect the grounding electrode conductor in conduit, this conduit shall be dedicated solely for this purpose.

Customers requiring an ungrounded service for operations as permitted by the NEC shall submit an exception request detailing the special circumstances necessitating the request. In addition, the customer shall state in the exception request that they are aware of and accept the increased risks of personal safety associated with an ungrounded service. Customers who receive an ungrounded service from the Company **MUST INSTALL** ground-fault detection sensing equipment on the load side of the main overcurrent protective device(s) (e.g., Erickson ground-fault detection equipment). When supplying an ungrounded service result in an additional cost to the Company, this may be passed on to the customer.

For electric service installations where galvanized steel RMC, aluminum RMC, or galvanized steel EMT is used on the supply side of the main service disconnect, bonded bushings or threaded hubs shall only be used at one end of the conduit to prevent appreciable circulating currents from flowing on the equipment enclosures. An exception to this would be when using metallic conduit for protection of the grounding electrode conductor. In this case, the NEC requires bonded bushings on both ends of this metallic conduit to prevent causing a high impedance path or inductive choke.

500.02 INTER-SYSTEM BONDING

The National Electrical Code requires in most situations an inter-system bonding termination to be made between the electrical system and other communication / broadband (CATV, Fiber, Telephone, etc.) systems located external to the main service disconnect, CT enclosure, or self-contained meter socket to minimize the potential differences between equipment of different systems. This inter-system bond shall not be attached to the meter socket, meter socket lid, or CT enclosure. This connector must be listed for the intended purpose and solidly affixed to the premises wall or other substantial premises structure.

500.03 GROUNDING METHODS

These notes relate to the drawings found in the Grounding ASM Section 500.

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 NEC and the requirements of the Authority Having Jurisdiction for the area the work is taking place.

3. Ameren requires, on most installations, an external grounding electrode to be electrically connected to the case and grounded conductor for self-contained meter sockets, meter disconnects, and CT enclosures that are mounted outdoors.

    - This electrode may act either as the sole or supplemental electrode for the service equipment associated with the premises. Installation and material used for the Ameren required external grounding electrode must meet all NEC requirements for size, material, and installation. If an external grounding electrode system is connected in an outdoor location at the self-contained meter socket or CT enclosure provided by the customer to meet NEC grounding requirements, then this grounding electrode system will also meet Ameren's requirement for an external grounding electrode.

    - Where other electrodes are available inside a premises, these become the grounding electrode system and **MUST NOT** be connected to the driven outside electrode that terminates within the self-contained meter socket, meter disconnect, or the CT enclosure, **EXCEPT** via the grounded (neutral) conductor. This wiring method will ensure that normal neutral currents **WILL NOT** flow on equipment grounding conductors. This method is allowed by the NEC where certain conditions are met. Reference the latest **NEC 250.142(A)** for use of the grounded circuit conductor for equipment grounding.

    - Where the customer has a main service disconnect within 10 feet and in sight of the Ameren self-contained meter socket or CT enclosure, connection of an external grounding electrode system to the main service disconnect is acceptable in lieu of landing in the utility metering equipment.

4. For a location where metering CT or CT / PT instruments are mounted inside customer owned switchgear, the grounding electrode conductor(s) is terminated inside the switchgear. The outdoor meter socket is grounded only by the equipment ground provided in the 11-conductor meter cable (**Missouri**) or the #10 copper equipment ground conductor run inside the meter cable conduit (**Illinois**).

5. Exceptions to the grounding methods found in **ASM Section 500** must be approved by Ameren Engineering prior to construction.

500.04 DRAWINGS

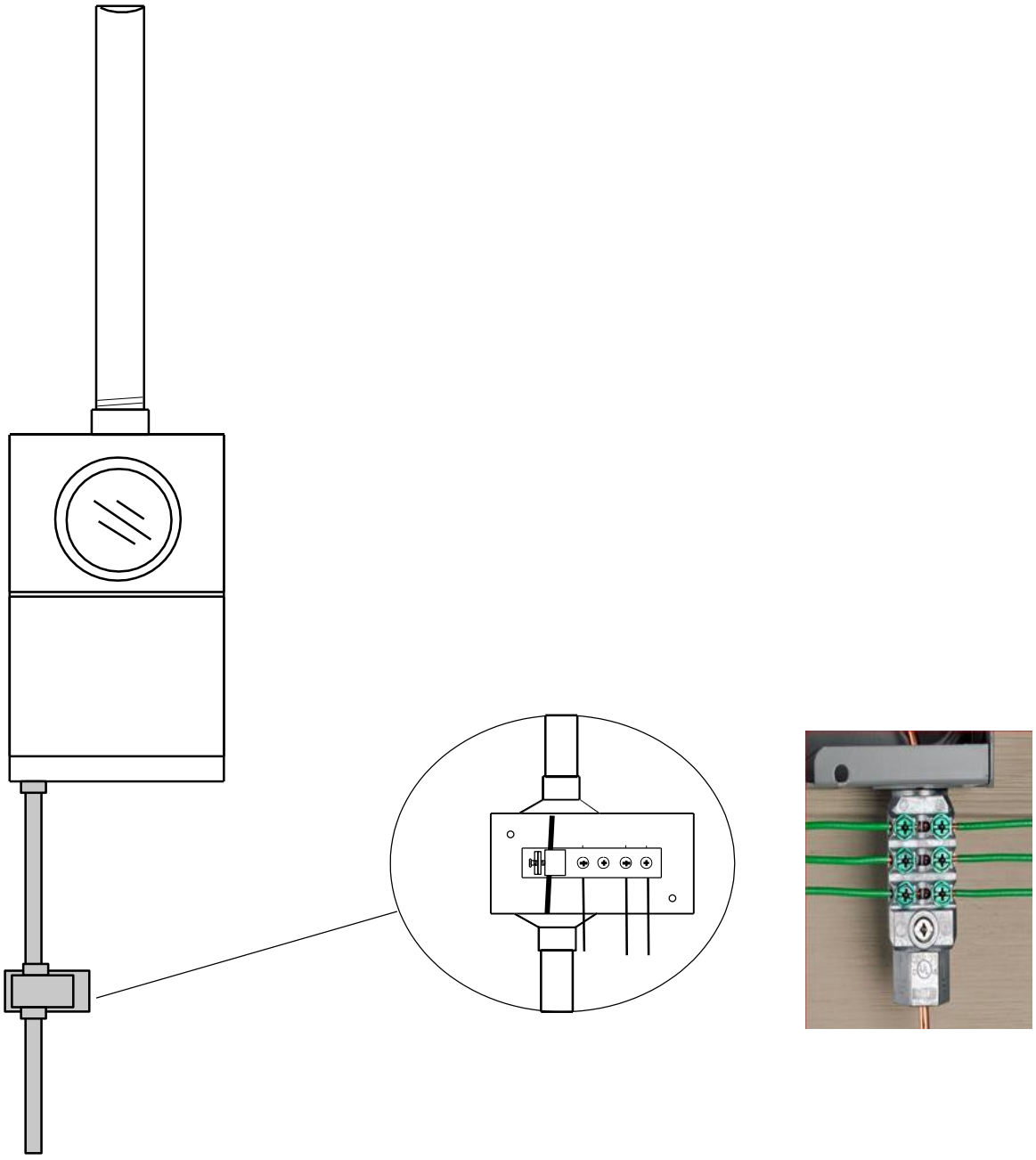
Figure 500-1 INTER-SYSTEM BONDING

Figure 500-2 1Ø AND 3Ø SELF-CONTAINED METERING LESS THAN 480 VOLTS
OPTION 1 - INTERIOR MAIN DISCONNECT

Figure 500-3 1Ø AND 3Ø SELF-CONTAINED METERING LESS THAN 480 VOLTS
OPTION 2 - EXTERIOR MAIN SERVICE DISCONNECT

Figure 500-4 1Ø AND 3Ø SELF-CONTAINED COLD SEQUENCE METERING 480 VOLTS (METER DISCONNECT / METER SOCKET IN SEPARATE ENCLOSURES)
OPTION 1 - INTERIOR MAIN SERVICE DISCONNECT

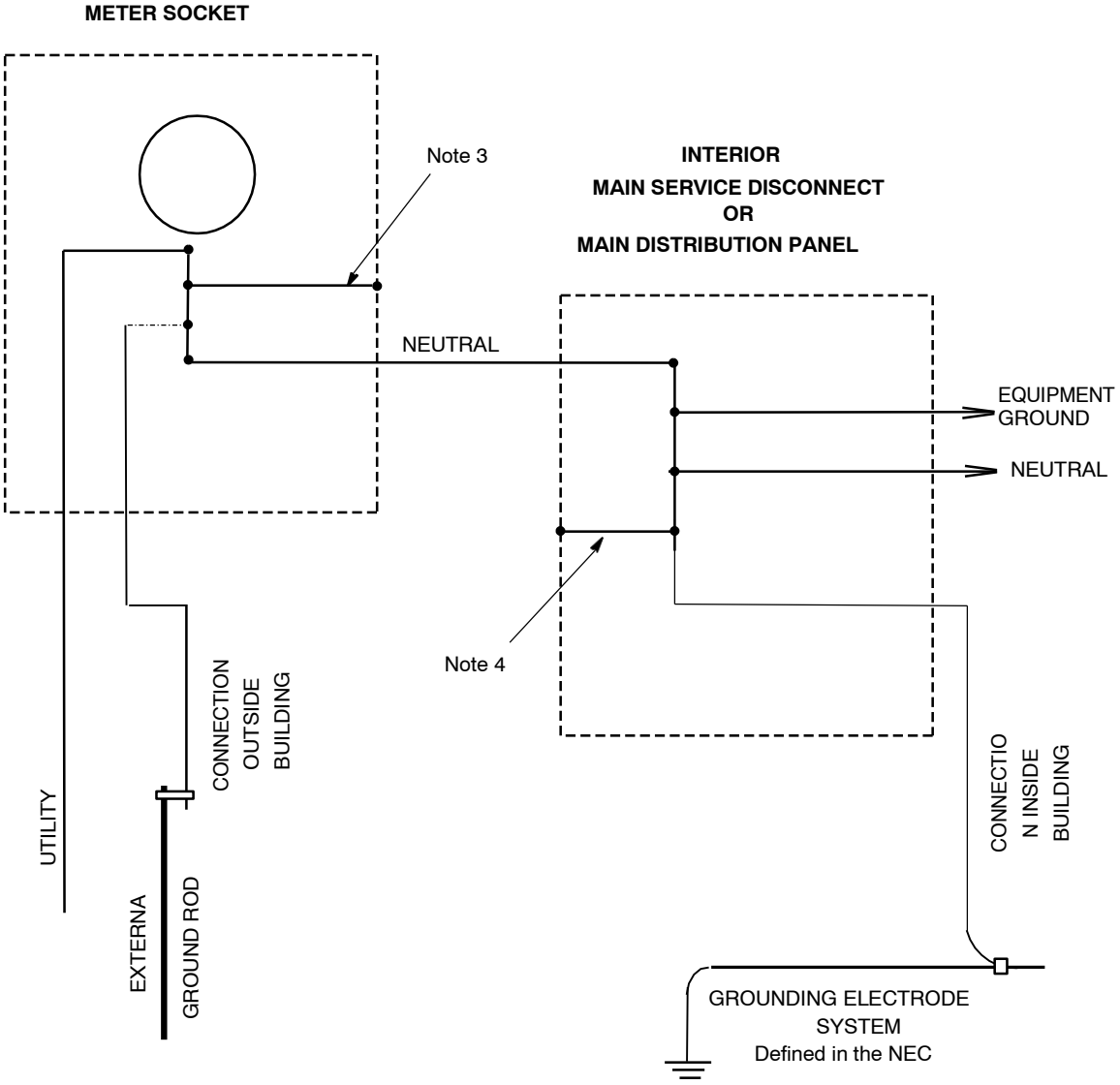
TYPICAL INTER-SYSTEM BONDING
Figure 500-1



CONSTRUCTION NOTE(s): (FIGURE 500-1)

1. Two types of inter-system bonding connectors are shown here. Refer to **ASM Section 500.02.**

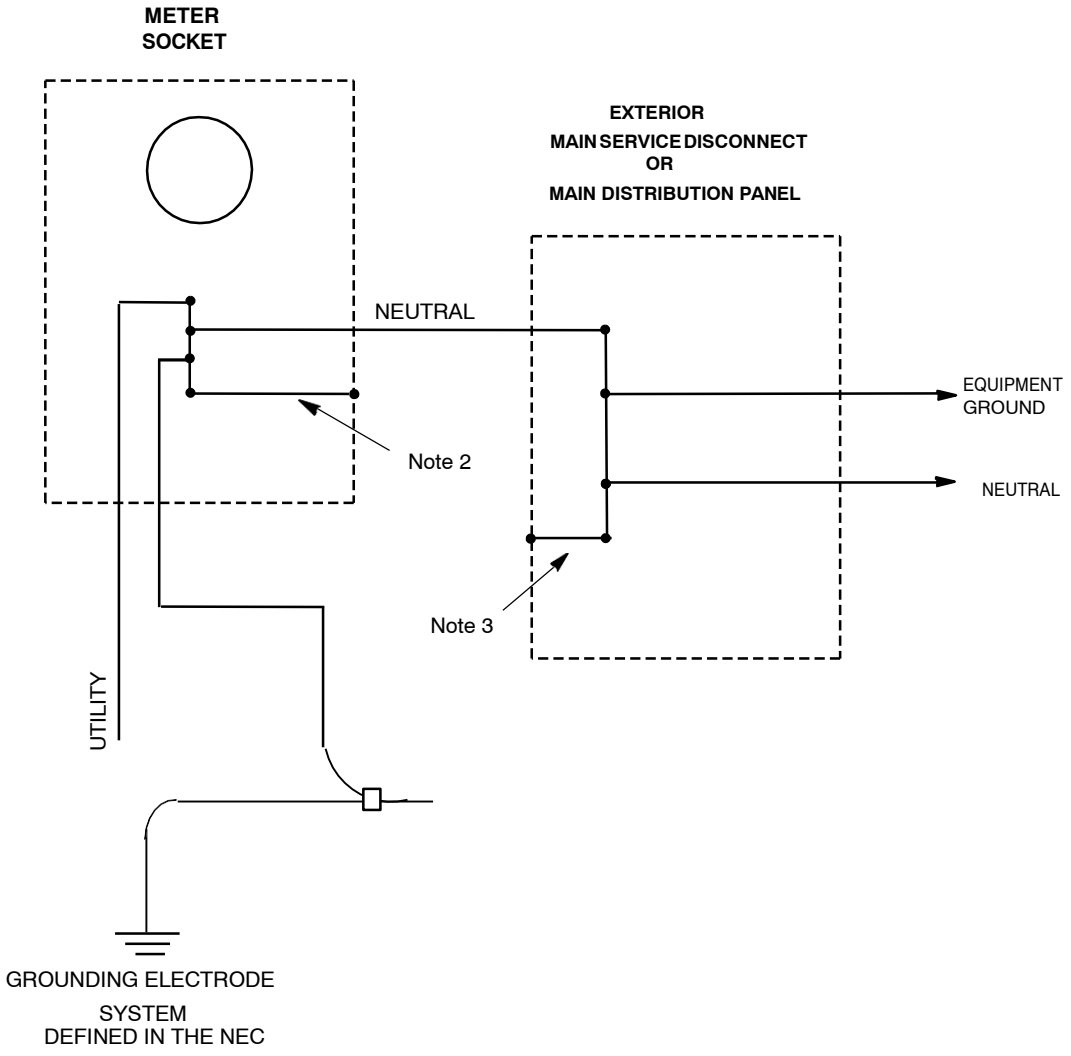
1Ø AND 3Ø SELF-CONTAINED METERING LESS THAN 480 VOLTS
OPTION 1 - INTERIOR MAIN SERVICE DISCONNECT
Figure 500-2



CONSTRUCTION NOTE(s): (FIGURE 500-2)

1. Refer to **ASM Section 500.03**.
2. If an external grounding electrode system is connected in an outdoor location at the self-contained meter socket provided by the customer to meet NEC grounding requirements, then this grounding electrode system will also meet Ameren's requirement for an external grounding electrode.
3. Bonding jumper between neutral and case.
4. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø SELF-CONTAINED METERING LESS THAN 480 VOLTS
OPTION 2 - EXTERIOR MAIN SERVICE DISCONNECT
Figure 500-3

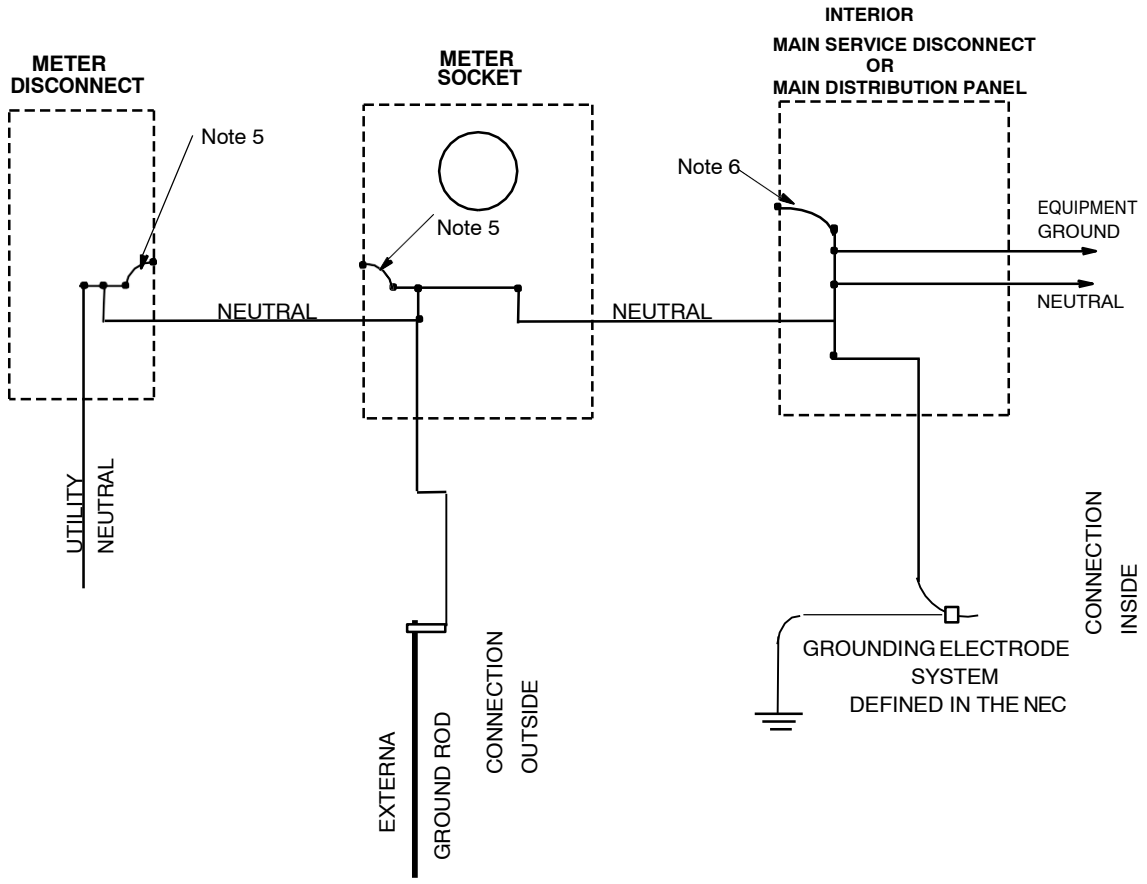


CONSTRUCTIO NOTE(s): (FIGURE 500-3)

1. Refer to **ASM Section 500.03**.
2. Bonding jumper between neutral and case.
3. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø SELF-CONTAINED COLD SEQUENCE METERING - 480 VOLTS
OPTION 1 - INTERIOR MAIN SERVICE DISCONNECT

Figure 500-4

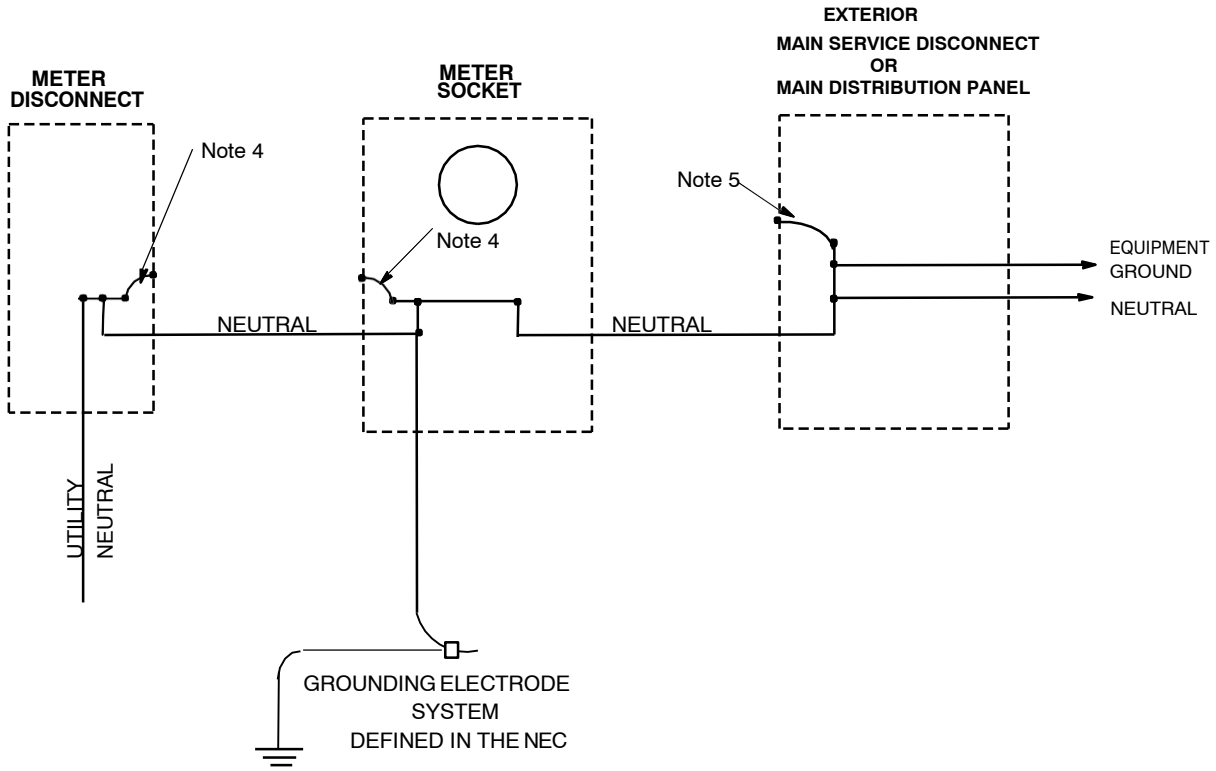


CONSTRUCTION NOTE(s): (FIGURE 500-4)

1. Refer to **ASM Section 500.03**.
2. The Ameren preferred external ground rod termination is in the meter socket. However, an alternate location for this external ground rod termination would be in the meter disconnect.
3. If an external grounding electrode system is connected in an outdoor location at the self-contained meter socket or meter disconnect provided by the customer to meet NEC grounding requirements, then this grounding electrode system will also meet Ameren's requirement for an external grounding electrode.
4. Meter disconnect must be a knife blade switch, with no over-current protection.
5. Bonding jumper between neutral and case.
6. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø SELF-CONTAINED COLD SEQUENCE METERING - 480 VOLTS (METER DISCONNECT / METER SOCKET IN SEPARATE ENCLOSURES) OPTION 2 - EXTERIOR MAIN SERVICE DISCONNECT

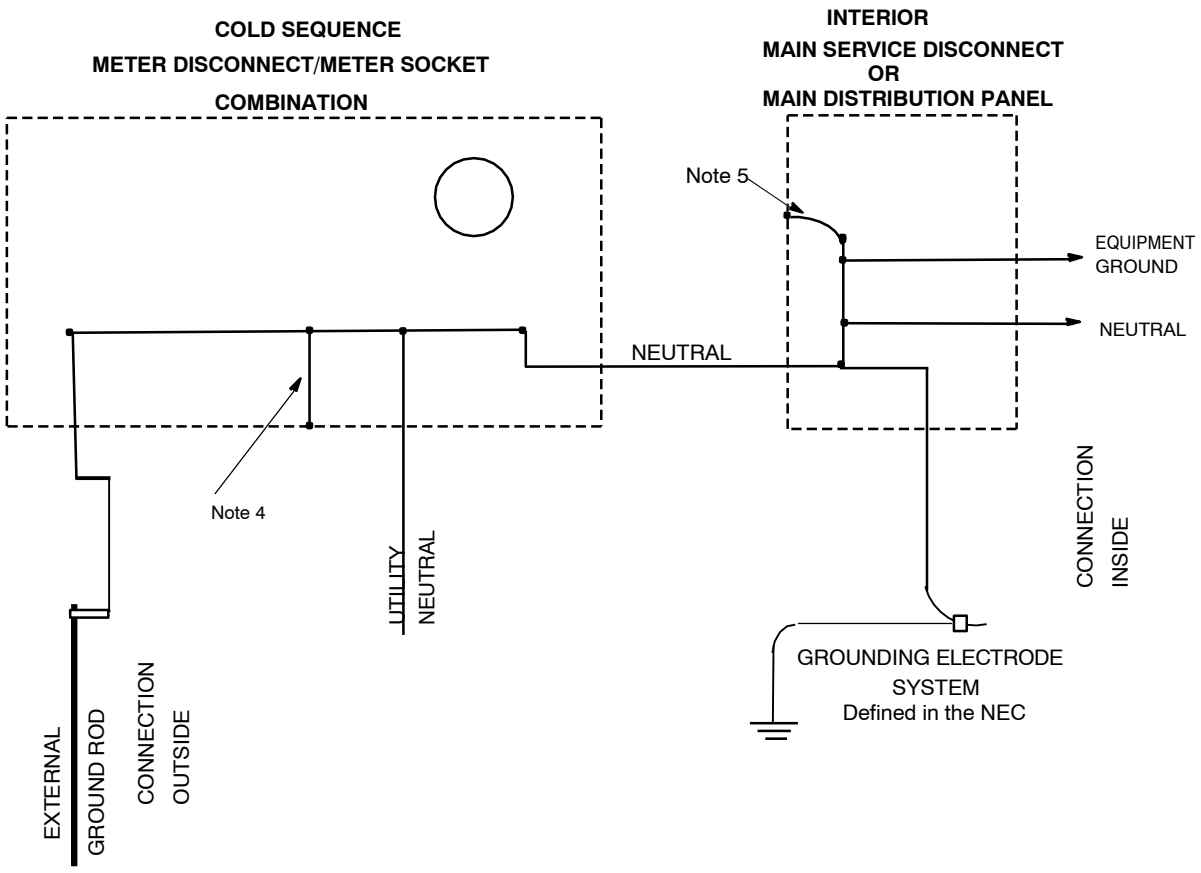
Figure 500-5



CONSTRUCTION NOTE(s): (FIGURE 500-5)

1. Refer to **ASM Section 500.03**.
2. When the main service disconnect is **exterior** of building and within 10 ft of metering, the Ameren preferred location to terminate the grounding electrode system is at the meter socket or meter disconnect. An alternate location allowed by NEC is at the Main Service Disconnect.
3. Meter disconnect must be a knife blade switch, with no over-current protection.
4. Bonding jumper between neutral and case.
5. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø SELF-CONTAINED COLD SEQUENCE METERING - 480 VOLTS METER DISCONNECT / METER SOCKET COMBINATION OPTION 1 - INTERIOR MAIN SERVICE DISCONNECT
Figure 500-6

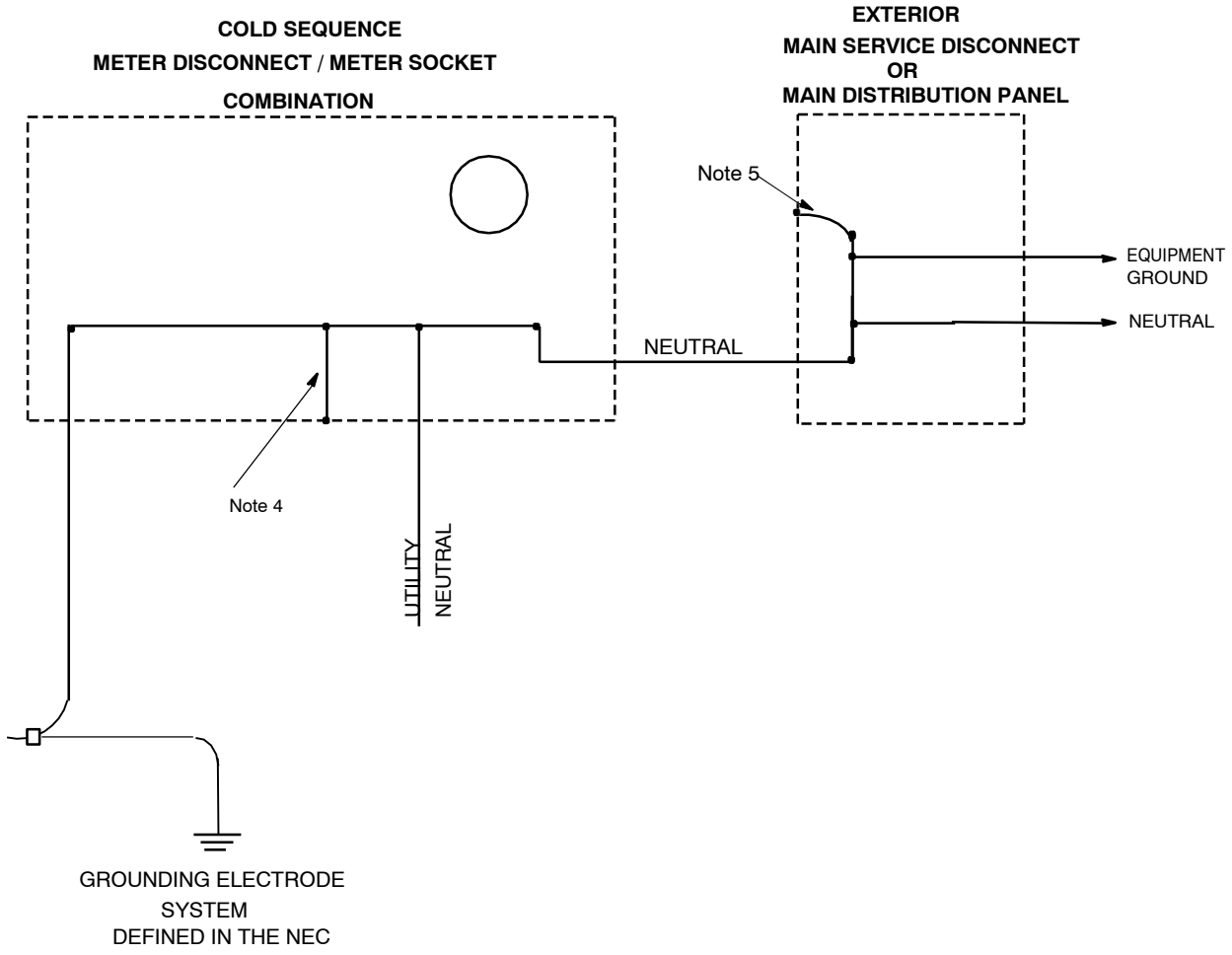


CONSTRUCTION NOTE(s): (FIGURE 500-6)

1. Refer to **ASM Section 500.03**.
2. If an external grounding electrode system is connected in an outdoor location at the self-contained meter disconnect / meter socket combination enclosure provided by the customer to meet NEC grounding requirements, then this grounding electrode system will also meet Ameren's requirement for an external grounding electrode.
3. Meter disconnect must be a knife blade switch, with no over-current protection.
4. Bonding jumper between neutral and case.
5. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø SELF-CONTAINED COLD SEQUENCE METERING - 480 VOLTS METER DISCONNECT / METER SOCKETCOMBINATION OPTION 2 - EXTERIOR MAIN SERVICE DISCONNECT

Figure 500-7

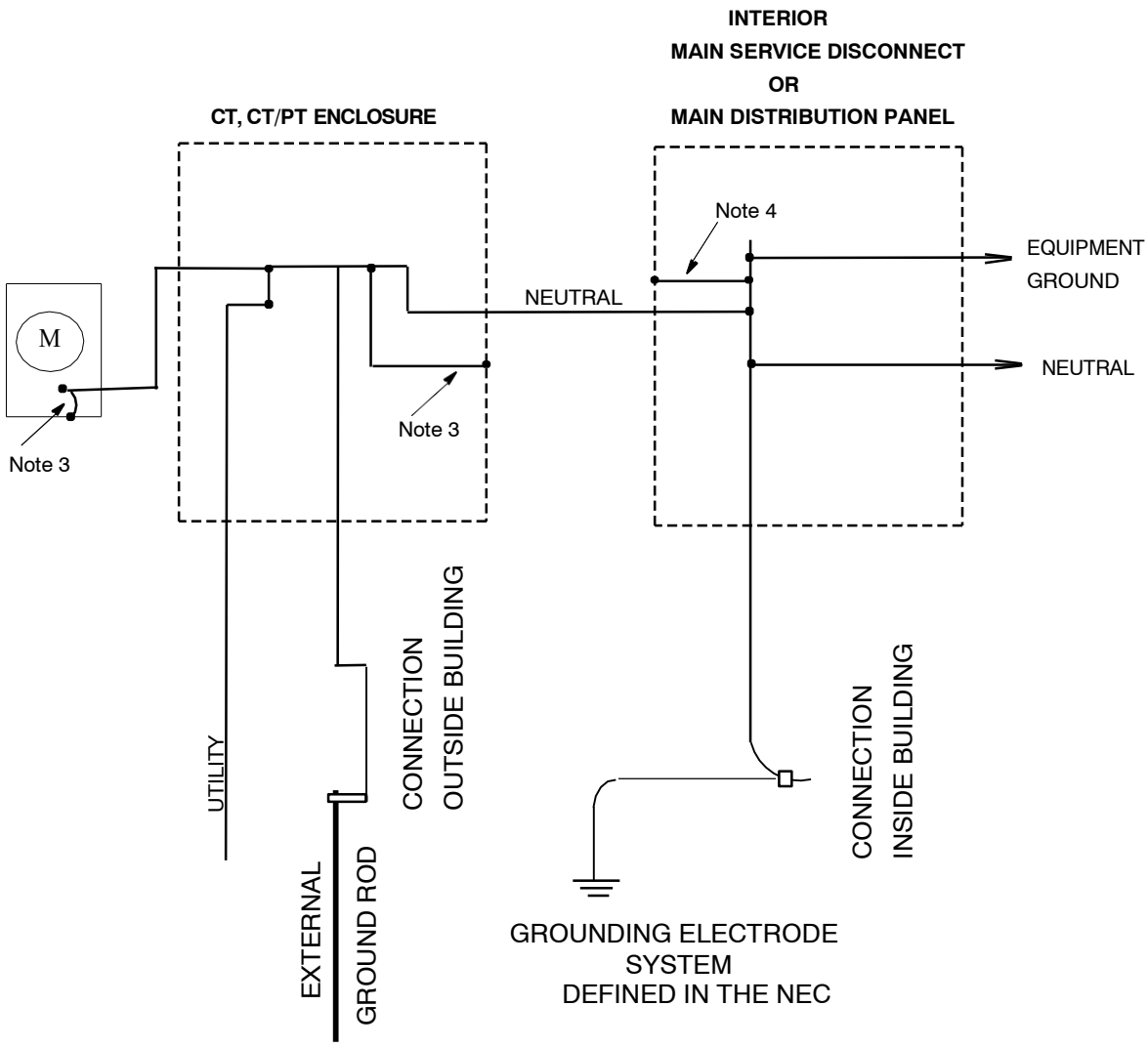


CONSTRUCTION NOTE(s): (FIGURE 500-7)

1. Refer to **ASM Section 500.03**.
2. When the main service disconnect is **exterior** of the building and within 10 ft of the metering, the Ameren preferred location to terminate the grounding electrode system is at the meter disconnect / meter socket combination enclosure. An alternate location allowed by NEC is at the Main Service Disconnect.
3. Meter disconnect must be a knife blade switch, with no over-current protection.
4. Bonding jumper between neutral and case.
5. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø INSTRUMENT TRANSFORMER METERING OPTION 1 – INTERIOR MAIN SERVICE DISCONNECT

Figure 500-8

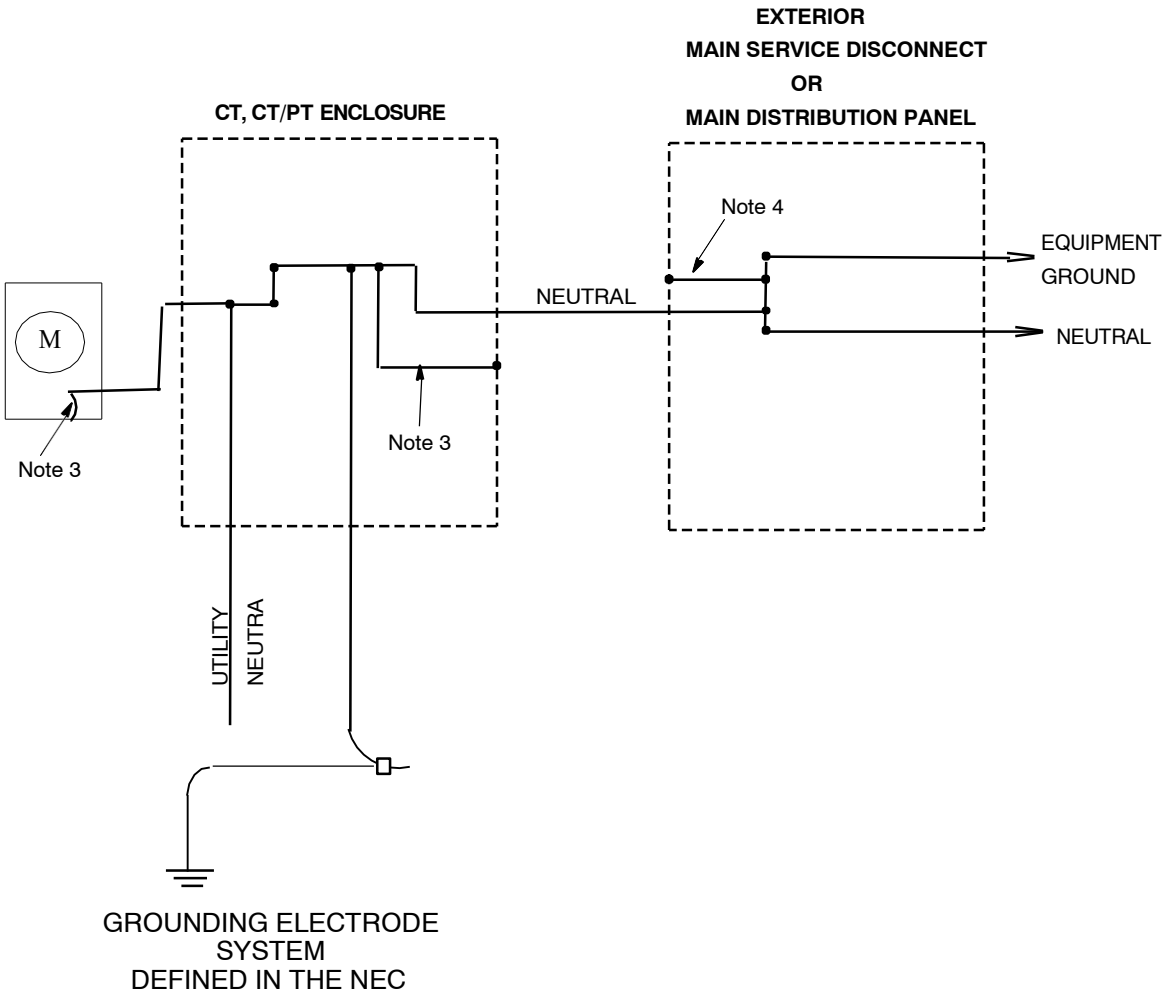


CONSTRUCTION NOTE(s): (FIGURE 500-8)

1. Refer to **ASM Section 500.03**.
2. If an external grounding electrode system is connected in an outdoor location at the CT enclosure provided by the customer to meet NEC grounding requirements, then this grounding electrode system will also meet Ameren's requirement for an external grounding electrode.
3. Bonding jumper between neutral and case.
4. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø INSTRUMENT TRANSFORMER METERING OPTION2–EXTERIOR MAIN SERVICE DISCONNECT

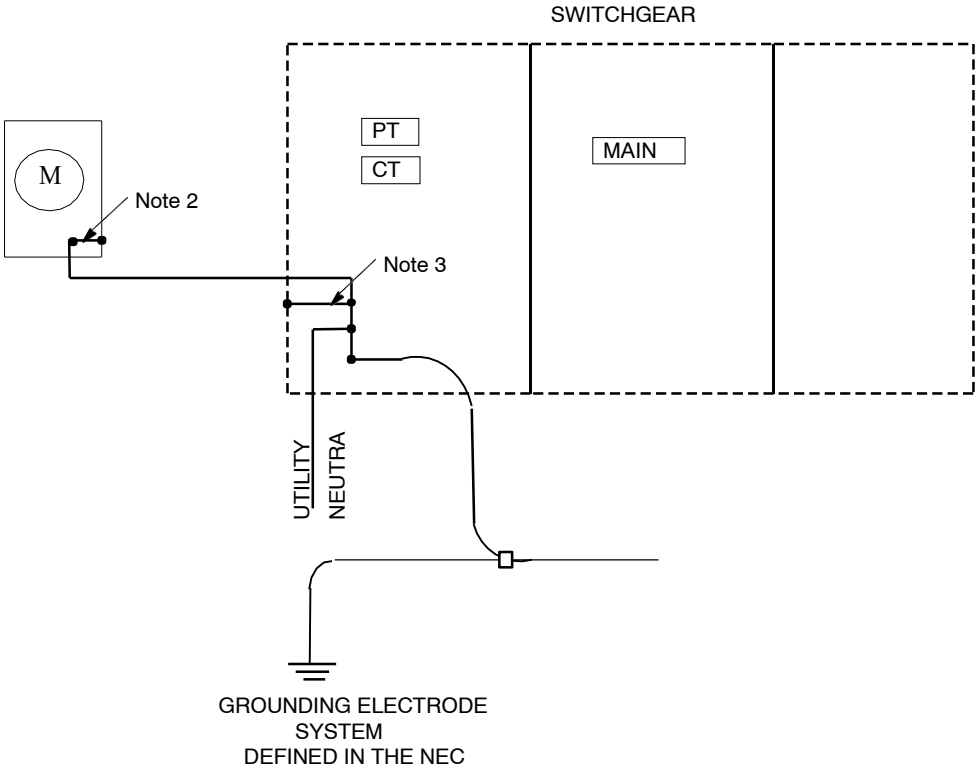
Figure 500-9



CONSTRUCTION NOTE(s): (FIGURE 500-9)

1. Refer to **ASM Section 500.03**.
2. When the main service disconnect is **exterior** of the building and within 10 ft of the CT or CT / PT enclosure, the Ameren preferred location to an alternate location to terminate the grounding electrode conductor is in the CT enclosure. An alternate location allowed by the NEC is at the main service disconnect.
3. Bonding jumper between neutral and case.
4. **MAIN** bonding jumper between neutral and case.

1Ø AND 3Ø INSTRUMENT TRANSFORMER METERING OPTION 3 - CT OR CT / PT MOUNTED IN SWITCHGEAR
Figure 500-10



CONSTRUCTION NOTE(s): (FIGURE 500-10)

1. Refer to **ASM Section 500.03**.
2. Bonding jumper between equipment ground and case.
3. **MAIN** bonding jumper between neutral and case.

600.01 SERVICE AVAILABILITY

1. It is the customer's responsibility to contact the Company to obtain service availability information, approved point of delivery and meter location, and to sign construction agreements when required. Some service characteristics, such as certain voltages or number of phases may not be available at or near the customer's location. Customers or their representatives should contact the Company to confirm service availability prior to purchasing and installing equipment. Requests for assistance should be made early in the customer's planning process. Sufficient time must be allowed for the Company to plan and make changes that may be necessary to its distribution system.
2. In Ameren Illinois, all new permanent services shall be installed underground unless good engineering practice dictates otherwise. Although Ameren Illinois desires all services to be underground, for existing overhead services where the customer is replacing equipment or upgrading the service, the service will be allowed to remain overhead if the ampacity of the new service equipment does not exceed 800 amperes. Other exceptions to this underground policy must be approved by Ameren Illinois in advance of construction. Temporary services can be provided overhead when served from an overhead distribution system. Check with your Ameren Illinois Engineering Representative to verify the latest policies.
3. The use of flexible metallic conduit, liquid tight flexible metallic conduit, and liquid tight flexible non-metallic conduit for service riser mast is prohibited.

600.02 SERVICE DROP ATTACHMENT

The Company has the right to designate the "spot or point of attachment" of its service drops to the customer's structure. The point of attachment is designated as the location where the Company's facilities attach to the customers facilities. This point of attachment of the overhead service to the customer's building / structure should be designated such as to reasonably minimize the length of the service drop.

The Company shall be contacted for approval of the feasibility of service route and attachment location. If, after so designating the attachment point, the length of the service would be excessively long and would create undue stress on the customer's attachment device and / or structure, a service support pole, including necessary guying, additional service cable, and other items will be installed and may be billable.

This ASM section provides Customer's guidance for acceptable placement of points of attachment. If the customer is not certain about the proper location of an attachment point, the Company shall be contacted to obtain specific direction. If a customer ignores the guidance given, making a service drop pole or other additional facilities necessary, the additional cost shall be borne by the customer. If the customer requests for a non-standard attachment point, and Company agrees, the additional facilities for the Company to reach (instead of one that would be preferable by the Company) as the economic choice for Customer's special requirements, the customer shall pay the installed cost of such facilities.

The customer shall provide safe, substantial support for the Company's service conductors. Failure to maintain safe and substantial support for Ameren facilities may lead to termination of service until the condition is corrected. The Company will not be responsible for the condition of, or damage to, a customer's building or structure to which the service drop is attached. Cinder block, stucco, veneer, and other similar type walls generally require galvanized bolts with metal backing plates to provide adequate support. Parapet walls, fire walls, and rooftop or fireplace chimneys are not acceptable supports for the point of attachment. Ranch style homes or buildings with flat roofs may require service masts to provide proper clearances.

Where through the roof service masts are installed, the customer assumes all responsibility for roof leaks. This mast must be constructed of galvanized steel RMC. Service masts must be of adequate strength or be supported by braces or guy wires to safely withstand the strain imposed by the service drop. The Attachment point must have sufficient height to meet clearance requirements stated in **ASM Section 800**. The service drop is not permitted to be secured to the mast between the weatherhead and a coupling installed above the last point where the conduit is secured to a building or structure. Only Company owned electric overhead service drop conductors shall be permitted to be attached to the service mast.

600.03 METER POLES - LESS THAN 1000 VOLTS

Meter service pole installations less than 1000 volts shall be supplied and installed by the customer at no cost to the Company for temporary services, portable buildings, mobile homes, trailers, recreational vehicles, and where several buildings are served from a single point. Consult with local Company engineering representative for approval for meter pole installations in Missouri. In Illinois, meter poles are not allowed for residential services. Poles are required to be of adequate strength and sufficiently supported, and must have a tag or brand stating height, class, and type of treatment at 6 ft above embedded depth. Failure to maintain safe and substantial support for Company facilities may lead to termination of service until the condition is corrected. A weatherproof main service disconnecting means with over current protection shall be provided by the customer where a service drop terminates on a privately owned meter pole structure. GFCI protection shall be provided as required by applicable codes.

600.04 TEMPORARY ELECTRIC SERVICE

When a temporary electric service is supplied for construction jobs, traveling shows, and mobile homes not deemed to be permanent, the Company will provide temporary service provided it has service in the area and has sufficient capacity available. The customer shall pay the cost of installing and removing the temporary line extensions or service connections and any other facilities of a temporary nature.

The customer shall provide a service entrance which meets the requirements of a permanent installation with respect to service drop clearances, safety, structure stability, and guying / bracing as required by the Company. Temporary electric service installations do not require a lever bypass for 200 amp and less.

Customer using temporary service is expected to give prompt notice to the Company when such service is to be disconnected. Notice shall include account number, location, and meter number to ensure proper identification.

The customer furnishes and installs the meter pole near the Company's power pole at least 10 ft away but no farther than 75 ft from the power source. See **ASM Section 800** for clearance requirements.

600.05 ELEVATED CT METERING (EXTERNAL POLE MOUNT / BIRD CAGE CTs) (NON-STANDARD)

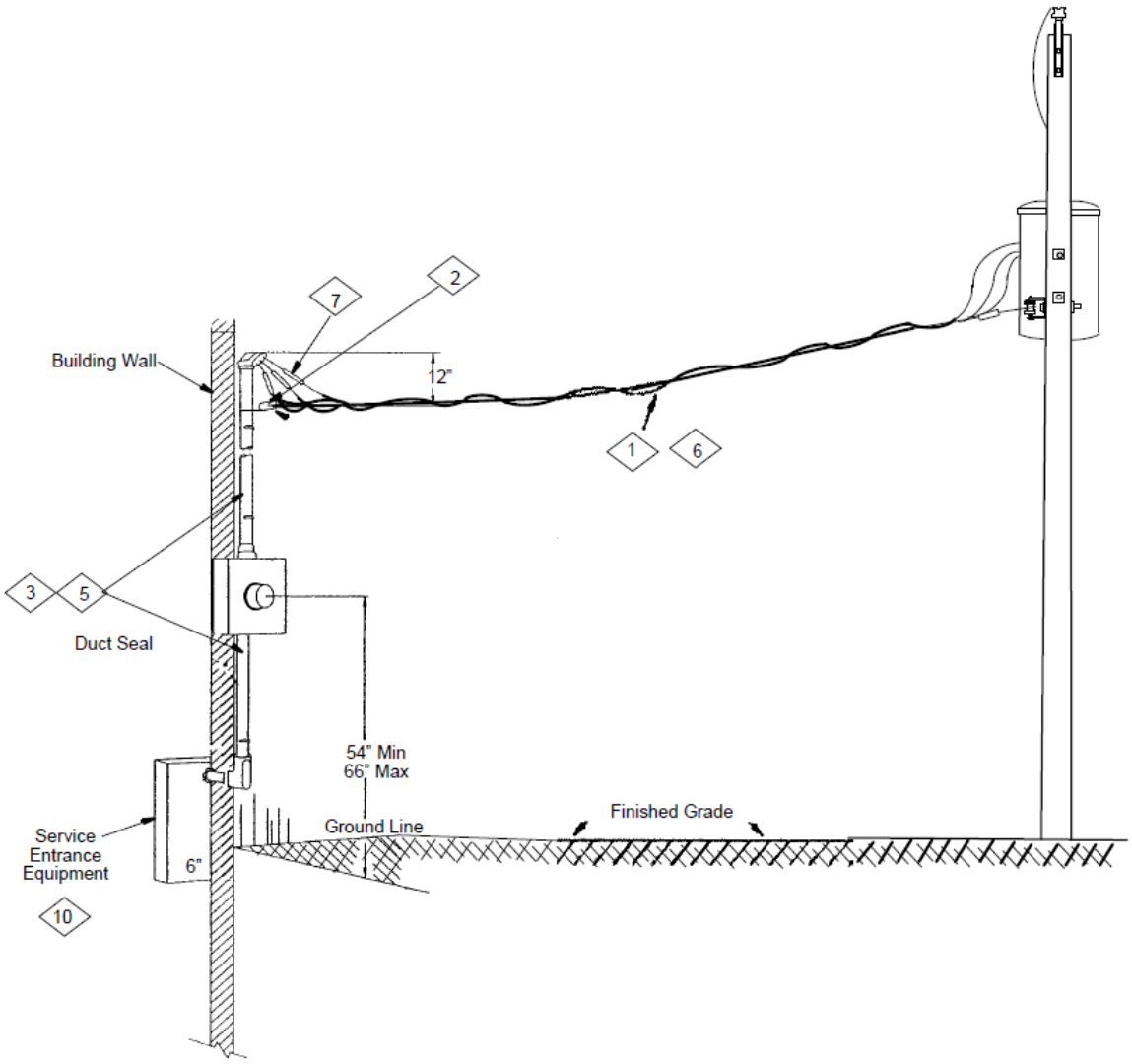
Elevated CT metering (commonly referred to as external pole mounted donut CTs or bird cage CTs) is non-standard. The Rewire Policy in **ASM Section 200** will apply to any installations that the customer desires to upgrade.

The Rewire Policy would also apply to these installations where an installer requests to make a Line (Supply) Side Tap for their DER Point of Interconnection.

600.06 DRAWINGS

Figure 600-1	TYPICAL PERMANENT SERVICE DROP
Figure 600-2	MAX IMUM STANDARD SERVICE DROP ATTACHMENT TO GALVANIZED STEEL CONDUIT MASTS
Figure 600-3	OVERHEAD SERVICE TO MULTIPLE WEATHERHEADS
Figure 600-4	CUSTOMER OWNED - TEMPORARY OVERHEAD METER POLE INSTALLATION
Figure 600-5	CUSTOMER OWNED - PERMANENT OVERHEAD METER POLE INSTALLATION - 100, 200, OR 320 AMPERES CONTINUOUS / 400 AMPERES MAX
Figure 600-6	OVERHEAD SERVICE CLEARANCES FOR ATTACHMENT TO BUILDINGS (0 TO 600 VOLTS)
Figure 600-7	OVERHEAD SERVICE ATTACHED TO BUILDINGS (0 TO 600 VOLTS)
Figure 600-8	NON-STANDARD ELEVATED CT METERING (EXTERNAL POLE / MAST MOUNTED CTs ON BIRD CAGE CTs)

TYPICAL PERMANENT SERVICE DROP
Figure 600-1



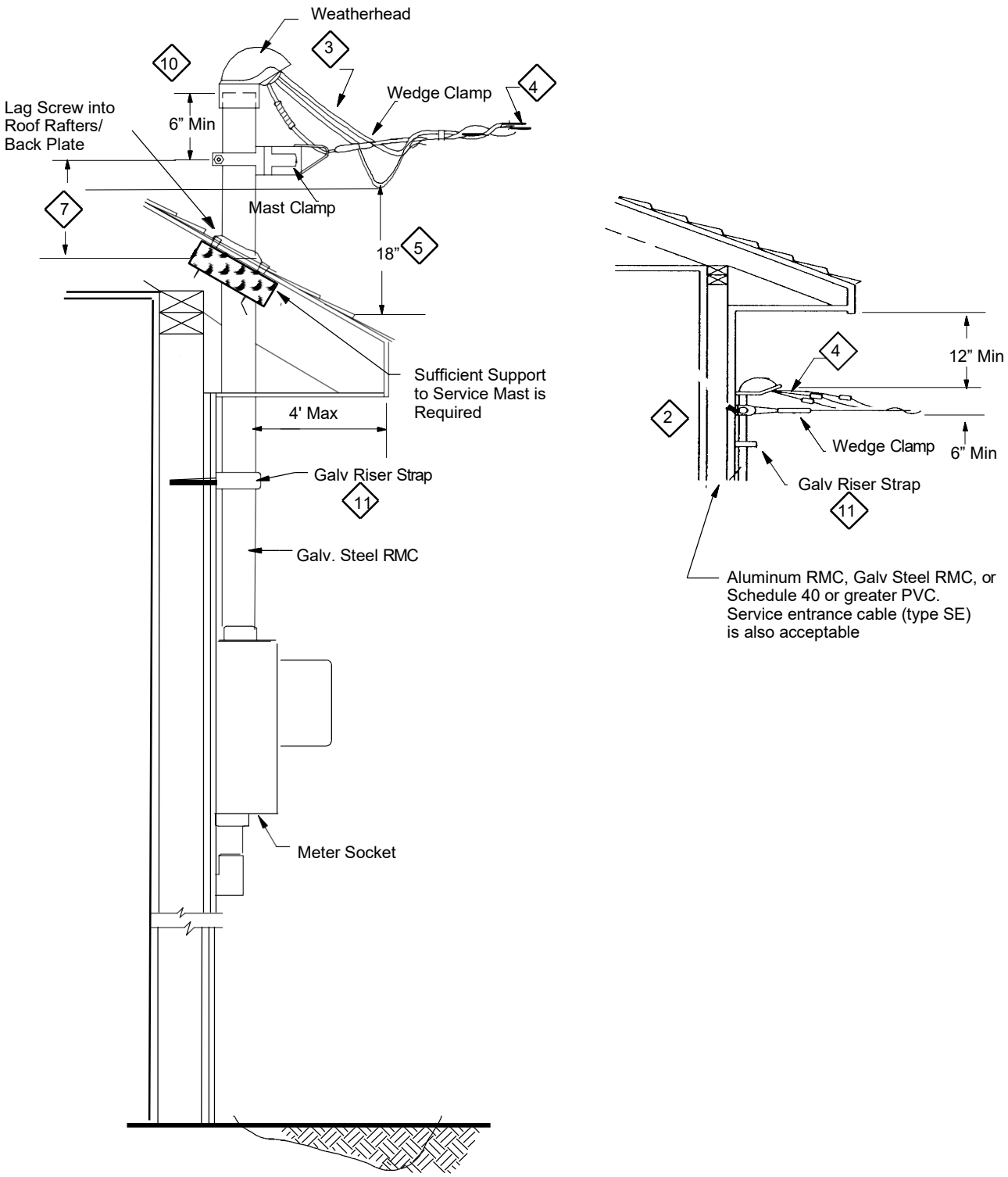
TYPICAL PERMANENT SERVICE DROP
Figure 600-1

CONSTRUCTION NOTE(s): (FIGURE 600-1)

1. Overhead service drops and the connections at each end of the service drop (service clamp or chicken catcher) will be owned, installed, and maintained by Ameren.
2. In Missouri, service attachment hardware is provided by Ameren and installed by customer. In Illinois, service attachment hardware with adequate strength for attachment of Ameren's service drop conductors is provide and installed by customer. **See ASM Figure 600-2**.
3. The weatherhead service raceway or conduit, service entrance conductors, service knob attached to the house, grounding electrode system, meter socket, and service entrance equipment will be installed, owned, and maintained by the customer. This installation shall meet the requirements of the latest edition of the National Electrical Code (NEC) or the requirements of the Authority Having Jurisdiction.
4. Grounding shall meet the requirements of the latest edition of the National Electrical Code (NEC) or the requirements of the Authority Having Jurisdiction.
5. Refer to **ASM Section 200 and ASM Figures 200-1, Figure 200-3A (IL) & 3B (MO), and Figure 600-6** for details regarding the location, installation, and placement of customer owned facilities.
6. For maximum residential service drop length, see **ASM Figure 600-2, Note 4**. For the maximum lengths of commercial overhead services, contact your local Ameren representative. Large service sizes, uneven grades, or a combination of these may require reduced service lengths or additional poles to maintain the required ground clearances. Additional charges may apply. Clearance requirements are outlined in **ASM Section 800**.
7. Service entrance conductors will extend approximately 3 ft from the weatherhead.
8. If the installation is an instrument rated installation, refer to **ASM Section 1001** for additional information.
9. Service entrance cable (type SE) consisting of a multiconductor assembly provided with an overall covering is permitted for use as a service riser and / or between the self-contained meter socket and main service disconnect.

MAXIMUM STANDARD SERVICE DROP ATTACHMENT HEIGHT TO GALVANIZED STEEL CONDUIT MAST

Figure 600-2



MAXIMUM STANDARD SERVICE DROP ATTACHMENT HEIGHT TO GALVANIZED STEEL CONDUIT MAST

Figure 600-2

CONSTRUCTION NOTE(s): (FIGURE 600-2)

1. Before installing electrical facilities, check for compliance with local codes as well as NEC.
2. The house knob screw shall be imbedded at least 2 in. into a vertical stud or masonry of the house. Another acceptable attachment such as clevis, bolt and backing plate may be substituted. If customer chooses to use mast clamp on conduit instead of house knob, then riser must be galvanized steel RMC. In Missouri, service attachment hardware is provided by Ameren and installed by customer. In Illinois, service attachment hardware with adequate strength for attachment of Ameren's service drop conductors is provide and installed by customer.
3. Approximately 36 in. or longer of customer's conductor will extend from weatherhead.
4. Max services drop lengths: #2 triplex - 125 ft; 1/0 triplex and quadplex - 100 ft; 4/0 triplex and quadplex - 75 ft.
5. Where the service riser mast is not more than 4 ft from the edge of the roof and the service is terminated on the service riser mast, with voltage between conductors not exceeding 300 volts, the service drop(s) and drip loop(s) are permitted to be not less than 18 in. above the roof line when within 6 ft of the service mast
6. Refer to **ASM Section 800** for required clearances.
7. Heights greater than shown in Table are possible provided that adequate guying and support are provided and approved by Ameren.
8. The conduit size specified below are the minimum requirement for either conduit fill capacity or strength requirement to support the overhead service, whichever is greater. Service drops can only be attached to risers made of galvanized steel RMC.
9. Ranch style homes or buildings with flat roofs may require service masts to provide proper clearance. When through the roof service masts are installed, the customer assumes all responsibility for roof leaks. Service masts must be of adequate strength or be supported by brackets or guy wires to safely withstand the strain imposed by the service drop. This mast must be galvanized steel RMC. The attachment point must have sufficient height to meet clearance requirements found in **ASM Section 800**.
10. The service drop is not permitted to be secured to the mast between the weatherhead and a coupling that is installed above the roof penetration or the last point where the conduit attaches to the building.
11. Riser straps must be placed at
    1) One no more than 12 in. above the meter socket hub.
    2) Subsequent straps at no greater than 30 in. spacing all the way to the roof decking.

MAXIMUM STANDARD SERVICE DROP ATTACHMENT HEIGHT TO GALVANIZED STEEL CONDUIT MAST

Figure 600-2

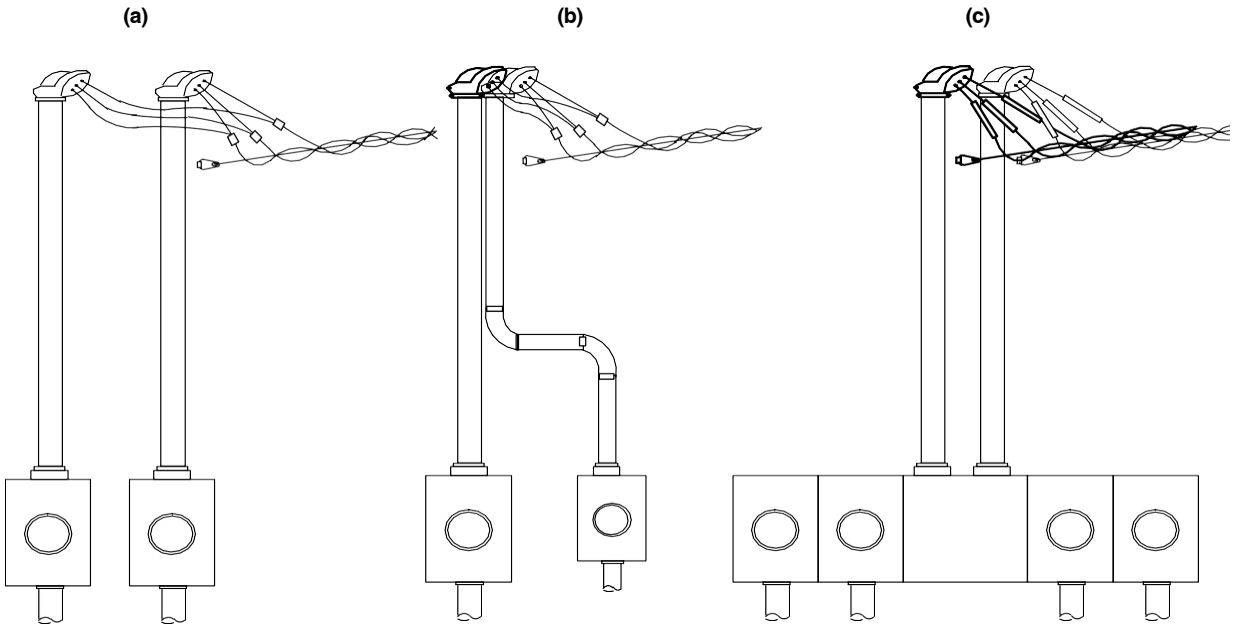
CONSTRUCTION NOTE(s): (FIGURE 600-2) (CONTINUED)

12. The roof support plate provides the main means of support for the mast. It shall be securely lagged to roof rafters. This can be accomplished by reinforcing underneath the roof decking with 2 in. X 6 in. wood material or by utilizing the following manufacturer roof support plate.

Manufacturer	2 in. Conduit	2-1/2 in. Conduit
PPC Insulators	7510	7511

Table - Maximum Attachment Height Above Roof (Note 8)					
Amperes	Phase	Utility Supplied Service Drop	2 in. Galvanized Steel RMC	2 ½ in. Galvanized Steel RMC	3 in. Galvanized Steel RMC
100 A	1	#2 Al, Triplex	2 ft 2 in.	4 ft 1 in.	-
200 A	1	#2 Al, Triplex	2 ft 2 in.	4 ft 1 in.	-
200 A	1	1/0 Al Triplex	2 ft 2 in.	4 ft	-
200 A	3	1/0 Al, Quadruplex	-	4 ft	-
400 A	1	4/0 Al. Triplex	-	-	4 ft
400 A	3	4/0 Al, Quadruplex	-	-	4 ft

OVERHEAD SERVICE TO MULTIPLE WEATHERHEADS
Figure 600-3



CONSTRUCTION NOTE(s): (FIGURE 600-3)

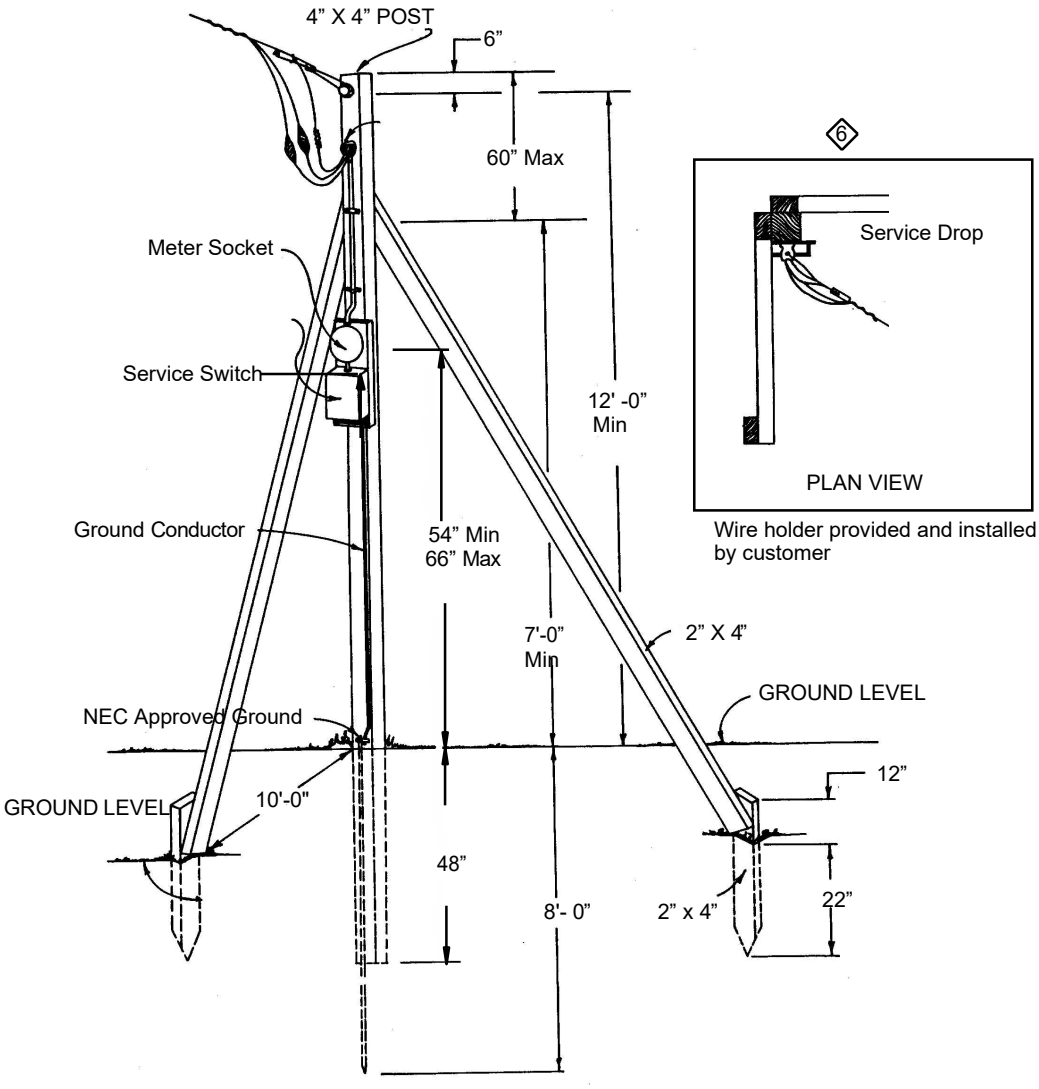
1. Ameren will connect to two (2) sets of service entrance conductors at a service point. If more than two (2) sets will be required, contact your local Ameren Representative for approval.
2. Service entrance conductors shall extend a minimum of 3 ft from the weatherhead or to the service landing point, whichever is greater. In addition, all service entrance conductors must be of adequate length to allow the parallel connection of conductors at a single point.
3. Overhead service drops and the connections at each end of the service drop will be owned, installed, and maintained by Ameren.
4. In Missouri, service attachment hardware is provided by Ameren and installed by customer. In Illinois, service attachment hardware with adequate strength for attachment of Ameren's service drop conductors is provided and installed by customer.
5. Contact your local Ameren Representative to discuss whether a parallel service will be required. If so, additional service drop attachments will be required.
6. The weatherhead, service raceway or conduit, service entrance cables, grounding electrode system, meter socket, and service entrance equipment will be installed, owned, and maintained by the customer. This installation shall meet the requirements of the latest edition of the National Electrical Code (NEC) or the requirements of the Authority Having Jurisdiction.

OVERHEAD SERVICE TO MULTIPLE WEATHERHEADS
Figure 600-3

CONSTRUCTION NOTE(s): (FIGURE 600-3) (CONTINUED)

7. Refer to **ASM Section 200 and ASM Figures 200-1, Figure 200-3A (IL) & 3B (MO), and Figure 600-6** for details regarding the location, installation, and placement of customer owned facilities.
8. Refer **ASM Figure 600-2** for maximum service drop length. Large service sizes, uneven grades, or a combination of these may require reduced service lengths or additional poles to maintain the required ground clearances. Additional charges may apply. Clearance requirements are outlined in **ASM Section 800**.
9. Refer to **ASM Section 1001** for a Current Transformer rated installation.

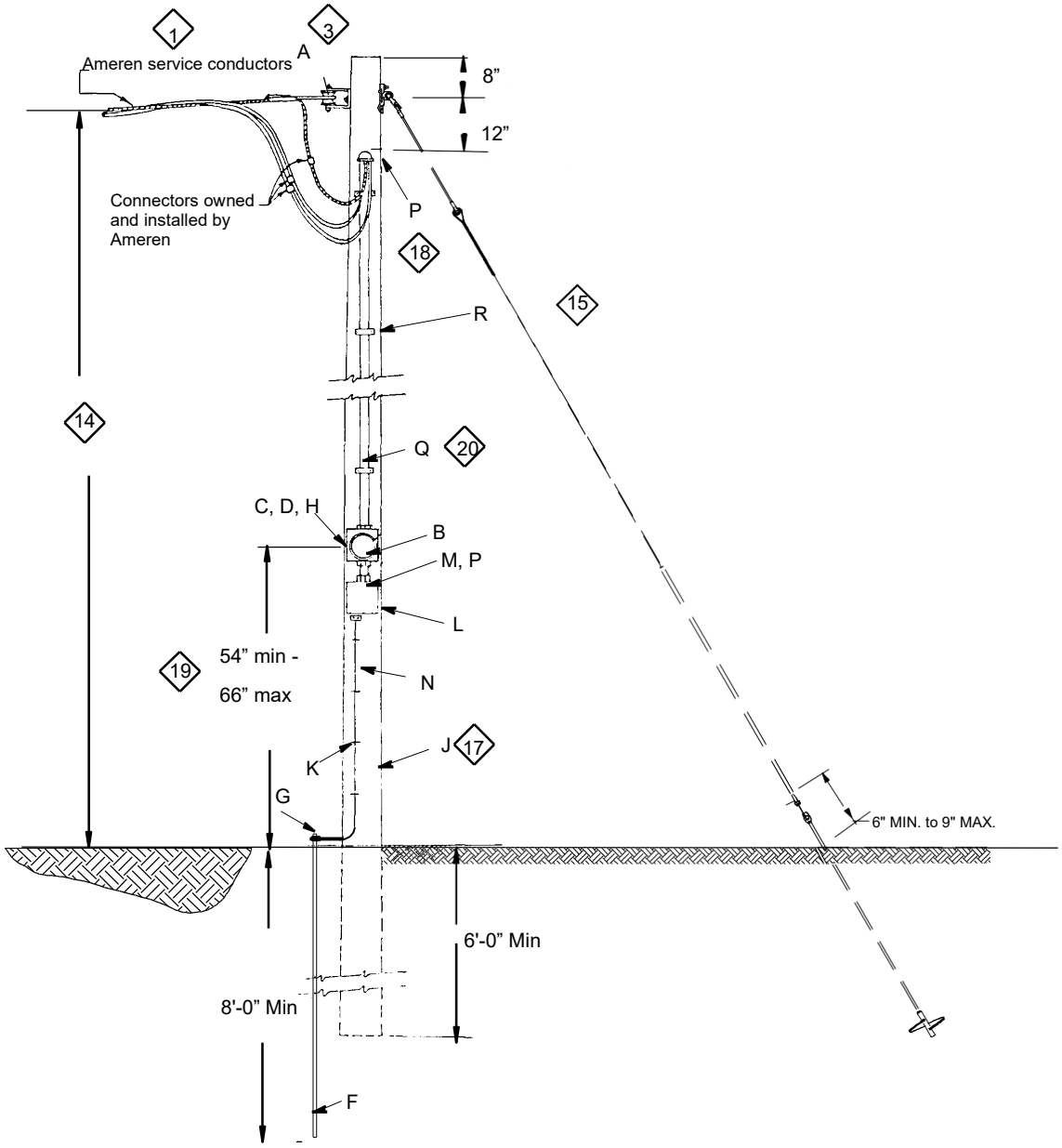
CUSTOMER OWNED - TEMPORARY OVERHEAD METER POLE INSTALLATION (200 AMPERES OR LESS)
Figure 600-4



CONSTRUCTION NOTE(s): (FIGURE 600-4)

1. Where practical, the service to the temporary connection should be installed in a manner suitable for transfer to the permanent location.
2. Temporary pole shall be located between 10 ft to 75 ft away from an Ameren pole.
3. GFCI protection is required on all temporary wiring per NEC.
4. Refer to **ASM Section 1000** for the approved meter socket.
5. Refer to **ASM Section 800** for clearance requirement.
6. Service Entrance Cable (Type SE) is permitted for use as a riser or between the self-contained meter socket and main service disconnect.

CUSTOMER OWNED - PERMANENT OVERHEAD METER POLE INSTALLATION
100, 200, or 320 AMPERES CONTINUOUS / 400 AMPERES MAX
Figure 600-5



CUSTOMER OWNED - PERMANENT OVERHEAD METER POLE INSTALLATION 100, 200, or 320 AMP CONTINUOUS / 400 AMPERES MAX Figure 600-5

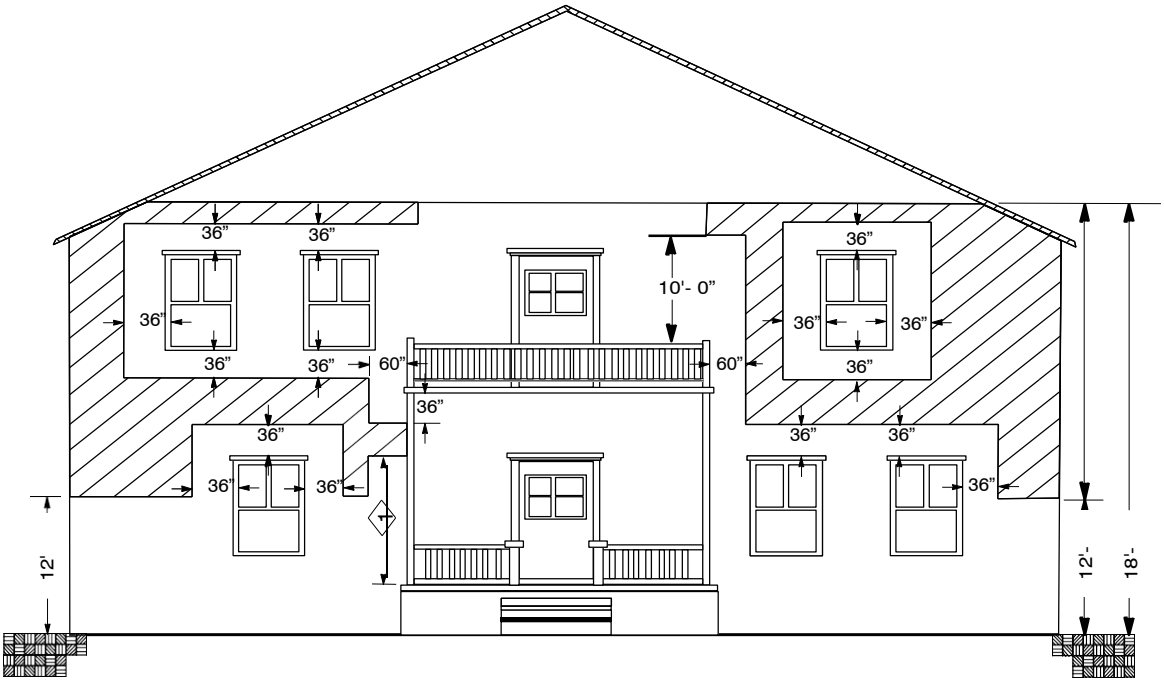
CONSTRUCTION NOTE(s): (FIGURE 600-5)

1. Service drop conductors, grips and connectors are provided, installed, and owned by Ameren.
2. See **ASM Figure 600-2** for maximum length of residential service drop. For all other services contact Ameren for maximum service lengths. Reduced distance or higher attachment point may be required for large service or to maintain minimum clearances.
3. In Missouri, service attachment hardware is provided by Ameren and installed by customer. In Illinois, service attachment hardware with adequate strength for attachment of Ameren's service drop conductors is provide and installed by customer.
4. Service entrance conductors to be connected to meter socket terminals by Customer. Service entrance conductors to extend a minimum of 36 in. or longer if required by local Authority Having Jurisdiction, outside the weatherhead for connection to service drop.
5. Service raceway and service entrance conductors to be owned, maintained, and installed by Customer.
6. Customer's installation to meet the requirements of all applicable local codes as well as the NEC.
7. Grounding shall meet the requirements of the latest edition of the National Electrical Code (NEC) or the requirements of the Authority Having Jurisdiction (AHJ).
8. Insulated conduit bushings are required for raceways terminating in the meter socket.
9. The use of flexible metallic conduit, liquid tight flexible metallic conduit, or liquid tight flexible non-metallic conduit for service riser mast is prohibited unless approved by the local Authority Having Jurisdiction (AHJ).
10. Liquid tight flexible non-metallic conduit is permitted between the self-contained meter socket and the main service disconnect where contoured surfaces or obstruction(s) exist.
11. Service entrance cable (type SE) is permitted for use as a riser or between the self-contained meter socket and main service disconnect.
12. The use of electrical grade schedule 40 or 80 PVC conduit for service mast, if it is not supporting service drop is allowed unless prohibited by the local Authority Having Jurisdiction (AHJ).
13. Customer to provide and install support for service attachment and meter socket.
14. Refer to **ASM Section 800** for required clearances.
15. When conductor tension exceeds the holding capacity of the pole, customer is required to install down guy and anchor of sufficient strength, and guy lead length to be same as service attachment height.
16. If customer installs a yard light on this pole, such yard light shall maintain a clearance to Ameren service conductors of not less than 24 in.
17. Meter pole provided by customer must have a tag or brand stating pole height, pole class and type of treatment at 6 ft above embedded depth.
18. Riser mast clamp must be within 6” of weatherhead.
19. When a meter base is over walkways less than 36 in. wide or in areas where flooding occurs, the center of the meter glass can be 78 in. above walking surface.
20. Riser mast clamps must be 30 in. or less apart.

CUSTOMER OWNED - PERMANENT OVERHEAD METER POLE INSTALLATION 100, 200, or 320 AMP CONTINUOUS / 400 AMPERES MAX Figure 600-5

NOTE	ITEM	DESCRIPTION (FIGURE 600-5)	QTY
MATERIAL INSTALLED AND OWNED BY AMEREN			
	B	Meter	1
MATERIAL INSTALLED AND OWNED BY CUSTOMER			
3	A	Clevis - Secondary	1
	C	Lock nuts	1
	D	Insulated Bushings	1
	F	Rod - Ground ½ in. x 8 ft	1
	G	Clamp - Ground ½ in.	1
	H	Meter Socket, Clamp Jaw Lever Bypass, refer to **BuildWithAmeren.com**	1
17	J	Pole, 25 ft Class 5 (Minimum) - New	1
	K	Staple	#
	L	Main Service Disconnect	1
	M	Nipple	1
	N	Ground Wire	#
	P	Entrance Cap	1
	Q	Conduit or Cable	#
	R	Clamp - Conduit or Type SE Cable	#
15	S	Guy and Anchor	1

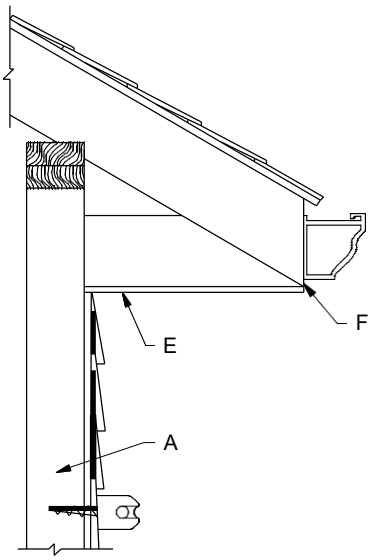
**OVERHEAD SERVICE CLEARANCES
FOR ATTACHMENT TO BUILDINGS
0 TO 600 VOLTS
Figure 600-6**



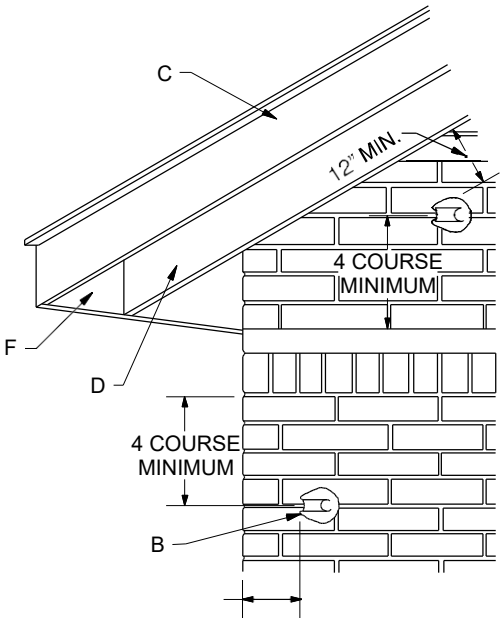
CONSTRUCTION NOTE(s): (FIGURE 600-6)

1. The point of attachment for service drop conductors shall be in the shaded spaces or higher. The minimum height of attachment is determined so that the lowest point of sag on the service drop meets NESC clearance requirements. A service mast may extend above the roof to meet minimum clearances. The point of attachment should be approved by Ameren and should not be located as to limit ladder access or crossing above deck, hot tub, spa, swimming pool, or stairwell.
2. Customer's weatherhead must be within 2 ft. of the point of attachment for service drop and remain in shaded areas.
3. The point of attachment for a service drop may exceed 18 ft. above groundline with the approval of the local Supervising Engineer. It is expected that alternative means such as utilizing a clearance pole or underground service would be used to maintain minimum clearances.
4. Ameren no longer provides triplex conductor or open conductor service busses on buildings. When opportunities present themselves, existing installations constructed in this manner should be eliminated.
5. Service conductors passing by doors, porches, fire escapes or similar locations shall have a clearance of not less than 36 in. Service conductors passing by windows shall have a clearance of not less than 36 in.
6. Service conductors shall not be installed beneath openings through which materials may be moved, such as openings in farm barn loft doors or commercial building openings. Overhead conductors shall run so they do not obstruct entrance to these building openings.

OVERHEAD SERVICES ATTACHED TO BUILDINGS
0 TO 600 VOLTS
Figure 600-7



Frame-Composition Shingle or
Brick Veneer Construction



Brick or Solid Masonry Construction

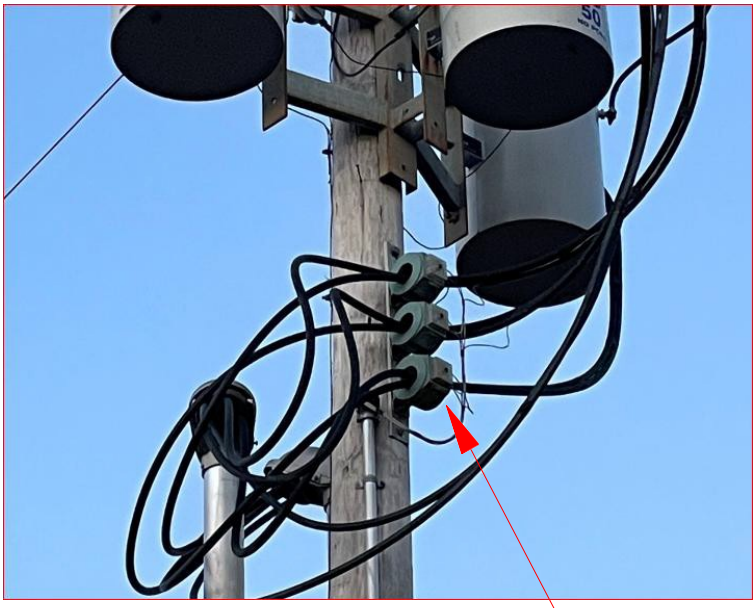
ITEM	DESCRIPTION	ACCEPTABLE/ UN-ACCEPTABLE POINT IF ATTACHMENT
A	Building Studs	Acceptable
B	Mortar Joints	Acceptable
C	Outside Trim Board	Attachment allowed only if adequately reinforced
D	Inside Trim Board (Brick Building)	Attachment allowed only if adequately reinforced
E	Soffit Board	Attachment allowed only if adequately reinforced
F	Fascia Board	Un-Acceptable
G	Fire Walls, Parapet Walls or Chimneys	Un-Acceptable

NON-STANDARD ELEVATED CT METERING (EXTERNAL POLE / MAST MOUNTED BIRD CAGE CTS)
Figure 600-8

Elevated (bird cage) CT Metering On a Meter Pole

Elevated (bird cage) CT Metering On Service Riser Mast

NON-STANDARD ELEVATED METERING CTS
(EXTERNAL POLE / MAST MOUNTED BIRD CAGE CTS)
Figure 600-8
(CONTINUED)



Elevated Donut Style CT on Pole

700.01A BASELINE REQUIREMENTS

1. Customers contemplating underground services should contact the Company as soon as possible so that the necessary arrangements, cost determinations, engineering, estimating, customer requirements and installation of facilities can be completed by the desired date.

2. Customer conduit options and requirements vary, based upon class of Customer, (residential vs. non-residential) location of the installation (Missouri vs. Illinois) and finished surface area above conductors (dirt vs. pavement). Contact Company for specifics.

3. Where the Company installs or has an underground system, only underground services will be available.

4. In an area with an overhead distribution system, Customer may request an underground service in Missouri. Each request for such service will be evaluated on an individual basis. The Company reserves the right to refuse underground service where it does not conform to good engineering practices. In Illinois, all new residential premises will be served UG, with limited exceptions. If applicable, please speak with your local Company engineering representative about variances to this Illinois policy.

5. Any removal of obstructions or restoration of sod or other landscaping features which become necessary because of the installation, maintenance, or replacement of service conductor shall be the Customers' responsibility.

6. Customer / Developer shall furnish:

   a. All easements required for installation, operation, and maintenance of Company facilities.

   b. Company will assist with obtaining easements from other landowners as required for line extensions. However, Company will not be held liable for the inability to obtain such easements. Customer may be asked by Company to assist with negotiations. Legal documents associated with such easements shall be prepared and executed by the Company.

   c. Clearly staked property corners.

   d. Conductor routes clear of all obstructions and within 6 in. of final grade.

7. For service installation(s) fed from underground systems, the service riser conduit(s) on the supply side of the customer's meter disconnect, self-contained meter socket, or CT enclosure shall not contain the grounding electrode conductor or an equipment grounding conductor.

8. All meter structures will be constructed using galvanized steel RMC and uni-strut material. Meter structures from wooden members will not be acceptable. Refer to **ASM Figures 700-10 & 700-11** for self-contained meter support.

9. The use of flexible metallic conduit, liquid tight flexible metallic conduit, and liquid tight flexible non-metallic conduit for service riser(s) is prohibited unless approved by the local Authority Having Jurisdiction.

700.01B AMEREN ILLINOIS

1. All new residential electric services will be installed underground by Ameren Illinois. Any exception to this must have Ameren Illinois approval in advance of construction.

2. Residential services will be installed by direct burial unless the customer provides a complete conduit system.

3. Non-Residential customers will install their own underground service conductor(s) to the Ameren Point of Delivery. Customer owned service conductor may be installed in conduit or direct buried.

4. Subdivisions - all Ameren line extensions (primary and secondary conductors) and street lighting will be placed underground.

5. Contact Ameren Illinois in advance of construction to learn about customer installed conduit system options and specifications.

6. Specific Ameren Illinois downtown areas of Bloomington, Champaign, Danville, Decatur, Galesburg, Normal, Ottawa, Peoria and Urbana are designated as heavy underground, grid networks, and / or spot networks. Service restrictions are specific to their corresponding area and Customer should consult Company to determine the voltage and method of supply that will be available prior to beginning customer engineering or purchasing of equipment. See **ASM Section 1350** for more details.

700.02 COMPANY OWNED RESIDENTIAL SERVICE INSTALLATIONS

A. Direct Buried Residential (Illinois ONLY)

1. The customer will provide and install the meter socket(s) or enclosure(s) and the line-side riser conduit(s) of Schedule 80 electrical grade PVC. This line conduit(s) shall extend from the meter socket(s) to a minimum of 18 in. below the groundline for a continuous conduit system or 24 in. for direct burial.

2. The customer provided conduit described in the previous item shall include a PVC male adapter, lock nut, and insulated bushing at the meter socket. If the required expansion coupling includes a male adapter end, only the lock nut and insulated bushing are required. At the below grade end of the conduit, a PVC male adapter and insulated bushing, or PVC coupling, or PVC end bell shall be installed to protect the direct buried conductor. If local authorities require rigid metal service conduits, then bonded bushings are required. Refer to **ASM Section 500** for metallic conduit bonding requirements.

3. Protection from mechanical damage and future access shall be provided and installed by customer for conductor under paved surfaces such as public or private driveways, roadways, streets, alleys, sidewalks, patios, etc. by installation of conduit at a minimum depth of 24 in.

4. Underground service conductors are not permitted beneath a pool, spa, or hot tub nor are underground service conductors allowed in the area extending 5 ft horizontally from the inside wall of a pool, spa, or hot tub.

   Where underground service conductors exist and a customer desire to install a new pool, spa, or hot tub, it is the customer / installer's responsibility to locate the pool, spa, or hot tub in adherence with the requirements above. This may require Ameren to relocate the underground service at the customer / installer's expense.

5. The conductor route must be cleared of all obstructions, both above and below grade, and within 6 in. of final grade for Company installations.

6. Customer must mark all customer owned buried facilities on their property prior to Ameren arriving on site to install underground facilities. If customer fails to mark buried facilities and damage occurs during installation of Company facilities, repairs will be made by the customer at no cost to the Company. Direct buried conductor(s) shall have a minimum burial depth of 24 in.

7. The maximum service length shall be determined by the Company. It is the customers' responsibility to secure information from the Company pertaining to allowable lengths for service installations.

8. In Illinois, Company will install, own, and maintain service conductors for one or two residential dwelling units on a single deeded lot. For three or more residential dwelling units on a single deeded lot, it is the customer's responsibility to install, own, and maintain service conductors. For locations where dwellings are constructed with zero lot line construction (e.g., a shared common wall, but separated deeds), the Company will install, own, and maintain the service conductor to each dwelling unit. If three or more service installations are grouped together in an assembly for zero lot line construction, the service conductors will be owned, installed, and maintained by the customers.

B. Continuous Conduit (Missouri - REQUIRED, Illinois - OPTIONAL)

1. The customer will provide and install the meter socket(s) or enclosure(s) and line-side riser conduit(s) of Schedule 80 electrical grade PVC. This conduit(s) shall include a PVC male adapter, lock nut, and insulated bushing at the meter socket(s). If the required expansion coupling includes a male insulated metal (or PVC) adapter end, only the lock nut and insulated metal (or PVC) bushing are required. The bottom lower left knockout of the meter socket is intended for Ameren's underground supply service conductors. All conduit sections shall be securely fastened together using standard grade cement. Refer to **ASM Figure 700-9** for customer owned and installed service conduit drainage at meter or pole if required.

2. The service riser conduit to the meter socket shall include an expansion coupling that allows for 12 in. fall for 2-1/2 in. conduit and 8 in. fall for 3 in. conduit.

3. Customer installed conduit shall be installed along the shortest route, and the number of bends (sweeps) shall be kept to a minimum. There shall be a maximum of 3 - 90^{o}, 36 in. radius bends (sweeps) for 2-1/2 in. conduit or 3 in. conduit installations. 24 in. radius bends (sweeps) are permitted where rock or foundation problems exist.

4. All sections shall be securely fastened together using standard grade cement.

5. Minimum burial depth in trenchable earth is 24 in. In rock or untrenchable soil, this depth may be reduced to 12 in. if service conductor is installed in Schedule 80 PVC conduit or encased in concrete. Depths of less than 12 in. are not permitted.

6. If it is not possible to achieve uniformity in the trench bottom it must be over-excavated 4 in. to 6 in. and the bottom refilled with good quality properly compacted bedding material. Approved materials: Sand, limestone screenings, concrete slurry, or concrete.

7. Service conduits to an energized pedestal or padmount transformer shall be terminated as follows:

    7.1 In Illinois, terminate the conduit 18 in. from the secondary pedestal and padmount transformer. Contact the Company in advance to determine what quadrant of the Ameren equipment should be utilized. Coordination with the Company is required to arrange for Company to complete the trenching and installation of customer provided conduit and bend (sweep).

    7.2 In Missouri, attach conduit to the previously installed flexible conduit marked by the red marker with 48 in. beyond the edge of the pedestal and / or transformer pad. After removing the cover, plug and conduit marker, join the flexible conduit to the rigid conduit using standard grade cement.

    7.3 In Missouri, Customer will install conduit into the secondary side of padmount transformers and secondary pedestals that do not have previously installed flexible conduit / stub-out.

        A. Only approved and licensed electrical contractors are allowed to perform this work. Contact the Ameren Missouri Customer Service Department at **800-552-7583** within the St. Louis Metropolitan area to open the transformer or pedestal and to cover the primary and secondary voltage connection points and conductors for safety purposes.

        B. Ameren Missouri will not allow the electrical contractor to install conduit into either a live front transformer (the primary voltage connections are exposed) or aluminum pedestal and will either:

            1) Replace the live front transformer or aluminum pedestal prior to an electrical contractor installing conduit or

            2) Electrical contractor to terminate conduit 18 in. from the edge of transformer pad. Contact Ameren Missouri for coordination.

8. For customer installed conduit extensions to overhead poles, Company will designate the quadrant of the pole for the customer to stub up the conduit bend. Customer must provide and install bell end couplings for cut primary and secondary conduits.

    8.1 In Illinois, customer will provide one (1) 10 ft. section of Schedule 80 electric grade PVC conduit for use on the bottom section of the service riser and then must provide additional 10 ft. sections of either Schedule 40 or 80 electric grade PVC conduit to reach the Ameren secondaries level on the pole. If the conduit system is for Ameren owned residential service or customer owned non-residential service conductors, a weatherhead must be provided by the owner. Ameren will provide / install the conduit riser brackets. Customer shall terminate conduit bend (sweep) 6 in. from the Ameren designated quadrant of the pole.

    8.2 In Missouri, Ameren provides and installs riser conduit up pole and associated conduit riser brackets. Customer will provide schedule 80 bend (sweep) at base of pole for complete conduit system. Customer shall terminate conduit bend (sweep) 6 in. from the Ameren designated quadrant of the pole.

9. Customer shall provide, install, and secure at each end a polyester pulling tape of 2500 lb. capacity when access inside Ameren equipment is not needed. Pulling tape must be extended a minimum of 10 ft. beyond each end of the conduit system. Ameren personnel will be responsible for providing and installing the pulling tape when access inside Ameren equipment is required to complete installation.

10. In Illinois, Company will install, own, and maintain service conductors for one or two residential dwelling units on a single deeded lot. For three or more residential dwelling units on a single deeded lot, it is the customer's responsibility to install, own, and maintain service conductors. In cases where a developer has a single deeded parcel that contains multiple dwelling structures (e.g., multiple structures that may be single or multiple dwelling occupancies), it is the developer's responsibility to install, own, and maintain all service conductors. For locations where dwellings are constructed with zero lot line construction (e.g., a shared common wall, but separated deeds), the Company will install, own, and maintain the service conductors. If three or more service installations are grouped together in an assembly for zero lot line construction, the service conductors will be owned, installed, and maintained by the customers.

11. In Missouri, Company owns, installs, and maintains the residential service conductors if the customer installs a complete conduit system. Customer has option to not install a conduit system, but in this case, they must own / install / maintain the service conductors. If the customer wants to install the service installation at a location farther than allowed by Ameren, this option is allowed if the customer installs, owns and maintains the service conductor for either direct buried or conduit system installation.

700.03 NON-RESIDENTIAL INSTALLATIONS

A. Requirement

The developer of non-residential property is required to install the continuous conduit system within the boundaries of the development project for Ameren owned primary and secondary conductors to the Point of Delivery shown in **ASM Figures 200-3A (IL) & 3B (MO)**.
Construction requirements for **Ameren Illinois** can be found:
"**SPECIFICATIONS FOR CUSTOMER-INSTALLED UNDERGROUND DISTRIBUTION FACILITIES (NON-RESIDENTIAL)",** and
Ameren Missouri can be found:
"SPECIFICATION FOR CUSTOMER AND AMEREN CONTRACTOR INSTALLED UNDERGROUND DISTRIBUTION FACILITIES (NON-RESIDENTIAL)" which should be secured from appropriate Company Operating Center when first considering such development plans.

1. Ameren does not install non-residential underground services.

2. Customer conduit shall be a minimum of schedule 40, electrical grade PVC, except the lowest (minimum of 5 ft. of) exposed conduit on the riser pole and the underground riser below the metering equipment, and conduit bend (sweep) which shall be a minimum of schedule 80. Galvanized Steel RMC will be acceptable at the metering equipment if required by the AHJ. Refer to **ASM Section 500** for metallic conduit bonding requirements.

3. For secondary voltage conductor owned by Ameren, the burial depth to the top of the conduit shall be no less than 24 in. For customer-owned service conductor, the burial depth to the top of the conduit shall be no less than 18 in. (24 in. If under paved roadways, alleys, driveways, parking lots, etc.) per the latest edition of **NEC Article 300.5**.
4. For primary voltage, 36 in. minimum burial depth, 36 in. minimum radius bends (sweep).

B. Service from a pole

Customer shall furnish, own, and maintain the materials for the service to the Company's pole and provide sufficient access space for the purpose of installing or changing Company equipment.

1. Customer shall furnish, own, and maintain all the materials for the service to the Company's conductors.
2. The customer shall install their facilities to the quadrant of the pole designated by the Company.
3. For a continuous conduit installation, the customer shall extend the facilities to the pole and include a 90-degree schedule 80 conduit bend (sweep) at the base of the pole at a Company designated location.
4. In Illinois, Customer shall furnish a 10 ft section of schedule 80 PVC (per riser) of appropriate size, the remaining section of schedule 40 PVC of appropriate size coupling(s), adapter(s), and weatherhead(s) for attachment to the riser pole and supply sufficient conductor to reach the Company's secondary transformer bushings or secondary conductors.
5. In Missouri, Company furnishes all conduits, coupling, and adapters for attachment to the riser pole.
6. Any conduits on a pole will require standoff brackets, supplied by Ameren.
7. Installation of facilities on the Company pole must be coordinated with local Company personnel. Company will make final connections.

C. Service from a padmount transformer

1. Customer shall furnish, own, and maintain all the materials for the service to the Company's padmount transformer and provide sufficient space for transformers, switches, and related equipment adjacent to paved surfaces intended for normal vehicular traffic or parking for the purpose of installing or changing Company equipment.
2. The customer must provide adequate length of service conductors for connection to the transformer secondary bushings, typically 6 ft above the transformer pad.

3. In Illinois, excavate to 18 in. from the face of existing padmount transformers. Coordination with the Company is required to arrange for Company to complete the trenching and installation of customer provided conduit and bend(s) (sweeps). For proposed new transformer installations, the customer is required to excavate to a point designated by Company and install all conduit, bend(s) (sweeps), and customer furnished service conductors. Customer is also required to backfill, level, and properly tamp the location for the new transformer installation. Bends (sweeps) should extend approximately 6 in. above the surface and have a protective bushing to smooth the conduit edge. Metallic conduit and / or metallic bends (sweeps) are not allowed in transformers, pedestals, or switch cabinets unless required by the local AHJ. Refer to **ASM Section 500** for metallic conduit bonding requirements.

4. In Missouri, for single phase padmount transformers rated 120/240 volts or three phase padmount transformers rated 208Y/120 volts:

   Customer will install conduit and conductor into the secondary voltage side of transformer, and ONLY approved and licensed electrical contractors are allowed to perform this work.

   Contact the Ameren Missouri Customer Service Department at **800-552-7583** within the St. Louis Metropolitan area to arrange for Ameren Missouri to open the transformer and to cover the primary and secondary voltage connection points and conductors for safety purposes.

   Ameren Missouri will not allow the electrical contractor to install conduit into a live front transformer (the primary voltage connections are exposed). Live front transformers will either:

   a.) Be replaced by Company prior to an electrical contractor installing conduit or

   b.) Electrical contractor to terminate conduit 18 in. from edge of transformer pad. Contact Ameren Missouri for coordination.

   The electrical contractor is required to coordinate with the Company to arrange for Company to complete the trenching and installation of customer provided conduit, bend, and conductor.

5. In Missouri for three phase energized transformers rated 480Y/277 volts, electrical contractor to terminate conduit 18 in. from the edge of the transformer pad. Contact Ameren Missouri for coordination.

   The electrical contractor is required to coordinate with the Company to arrange for Company to complete the trenching and installation of customer provided conduit, bend (sweep) and conductor.

D. Service from a pedestal

1. Customer shall furnish, own, and maintain all the materials for the service to the Company's pedestal.

2. Service conduits to an energized pedestal or padmount transformer shall be terminated as follows:

2.1 In Illinois, terminate the conduit 18 in. from the secondary pedestal and padmount transformer. Contact the Company in advance to determine what quadrant of the Ameren equipment should be utilized. Coordination with the Company is required to arrange for Company to complete the trenching and installation of customer provided conduit and bend (sweep).

2.2 In Missouri, attach conduit to the previously installed flexible conduit marked by the red marker with 48 in. beyond the edge of the pedestal and / or transformer pad. After removing the cover, plug and conduit marker, join the flexible conduit to the rigid conduit using standard grade cement.

2.3 In Missouri, Customer will install conduit into the secondary side of padmount transformers and secondary pedestals that do not have previously installed flexible conduit / stub-out.

A. Only approved and licensed electrical contractors are allowed to perform this work. Contact the Ameren Missouri Customer Service Department at **800-552-7583** within the St. Louis Metropolitan area to open the transformer or pedestal and to cover the primary and secondary voltage connection points and conductors for safety purposes.

B. Ameren Missouri will not allow the electrical contractor to install conduit into either a live front transformer (the primary voltage connections are exposed) or pedestal and will either:

1) Replace the live front transformer or aluminum pedestal prior to an electrical contractor installing conduit or

2) Electrical contractor to terminate conduit 18 in. from the edge of the transformer pad. Contact Ameren Missouri for coordination.

3. Company will complete the service connection in all cases.

700.04 TEMPORARY SERVICES

1. When a temporary service is supplied for construction jobs or other approved uses, customer shall pay the cost for installing and removing the temporary line extension or service connection and any other facilities of a temporary nature.

2. Temporary underground service for construction in underground distribution system areas will be provided to the customer only when the permanent underground distribution system has been installed. Customer requests for temporary service prior to the completion of the permanent underground distribution system shall be negotiated and furnished at the customer's expense.

3. The customer shall provide and install the meter socket or enclosure and service conductors from the supply side of the meter socket to the transformer or power pedestal. Company shall make the connection between the customer's conductors and the Company's distribution equipment.

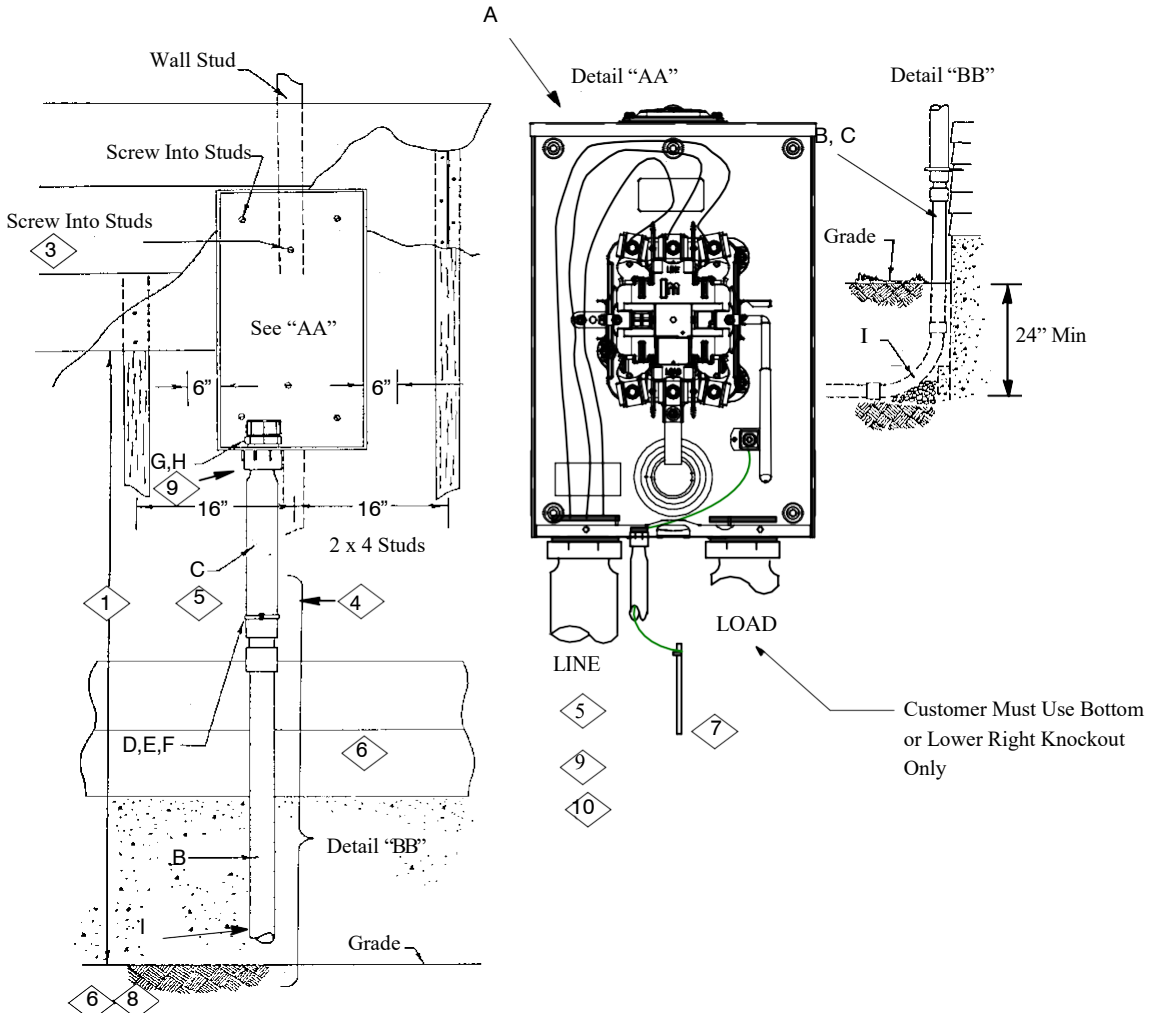
4. In Illinois, the structure supporting the meter installation shall be located within 15 ft. of, but no closer than 5 ft. to the Company's designated point of service.

5. In Missouri, if Customer temporary service is installed per **ASM Figure 700-14A &14B**, the meter structure shall not exceed 6 ft. but be no less than 3 ft. from the Company padmount transformer or secondary pedestal.

700.05 DRAWINGS

Figure 700-1	SINGLE SERVICE INSTALLATION: RESIDENTIAL / NON-RESIDENTIAL (SINGLE PHASE 200 AMP)
Figure 700-2	SINGLE SERVICE INSTALLATION: RESIDENTIAL / NON-RESIDENTIAL (SINGLE PHASE 320 AMP CONTINUOUS / 400 AMP MAX)
Figure 700-3	MULTIPLE SERVICE INSTALLATIONS FOR 2 TO 6 METERS SINGLE PHASE ONLY
Figure 700-4	TYPICAL VERTICAL GANGED METER STACK: UNDERGROUND SERVICE 4, 5, OR 7 TERMINAL METER SOCKET; ONE OR TWO MAIN SERVICE DISCONNECT(S)
Figure 700-5	AMEREN SERVICE CONDUCTOR - CONTINUOUS SERVICE CONDUIT INSTALLATION: RESIDENTIAL CUSTOMERS - **ILLINOIS ONLY**
Figure 700-6	CUSTOMER OWNED AND INSTALLED SERVICE CONDUIT: RESIDENTIAL SUBDIVISION - **MISSOURI ONLY**
Figure 700-7	CUSTOMER OWNED AND INSTALLED, DIRECT BURIED SERVICE CONDUCTOR; CONNECTION TO PEDESTAL, PADMOUNT TRANSFORMER, OR POLE: NON-RESIDENTIAL - **ILLINOIS ONLY**
Figure 700-8A	CUSTOMER OWNED AND INSTALLED SERVICE CONDUCTOR & CONTINUOUS CONDUIT SYSTEM: CONNECTION AT POLE - NON-RESIDENTIAL
Figure 700-8B	CUSTOMER OWNED AND INSTALLED SERVICE CONDUCTOR IN CONTINUOUS CONDUIT SYSTEM: CONNECTION AT PEDESTAL, PADMOUNT TRANSFORMER FOR ALL VOLTAGES: NON-RESIDENTIAL
Figure 700-9	CUSTOMER OWNED AND INSTALLED SERVICE CONDUIT DRAINAGE AT METER OR POLE IF REQUIRED
Figure 700-10	CUSTOMER PROVIDED METER STRUCTURE FOR SINGLE POSITION SELF-CONTAINED METER / MAIN DISCONNECT(S)

SINGLE SERVICE INSTALLATION
RESIDENTIAL / NON-RESIDENTIAL (SINGLE PHASE 200 Amp)
Figure 700-1



SINGLE SERVICE INSTALLATION
RESIDENTIAL / NON-RESIDENTIAL (SINGLE PHASE 200 Amp)
Figure 700-1

CONSTRUCTION NOTE(s): (FIGURE 700-1)

1. See **ASM Section 200** for mounting height, approved locations, and requirements for mechanical protection.

2. All materials except the supply conductors shall be furnished, installed, and connected by customer.

3. The meter socket shall be secured to solid wood and use #14 x 3 in. wood screws or stainless-steel screws. In brick, use expansion shields and lag screws. No drywall screws accepted.

4. The conduit hanger shall be securely fastened, preferably by a lag screw into the floor joist. If attached to the foundation, a lead expansion shield shall be used. An alternative to the expansion shield is a stud shot into the foundation.

5. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser). The expansion coupling should be installed with the outer sleeve fitted into the meter socket with the inner sleeve positioned at the manufacturer's midway mark.

6. The area underneath the bend (sweep) shall consist of good quality fill material and dirt free of debris. The area shall be compacted around the foundation wall. Acceptable fill materials: sand, limestone screenings, or concrete slurry, concrete.

7. Approved NEC bonding / grounding required.

8. For services 200 amperes and less, 2-1/2 in. electrical grade PVC conduit, expansion coupling, bends (sweeps), and connectors shall be used. Minimum bend (sweep) radius of 36 in. is required, but a 24 in. radius bend (sweep) is permitted where rock or foundation problems exist.

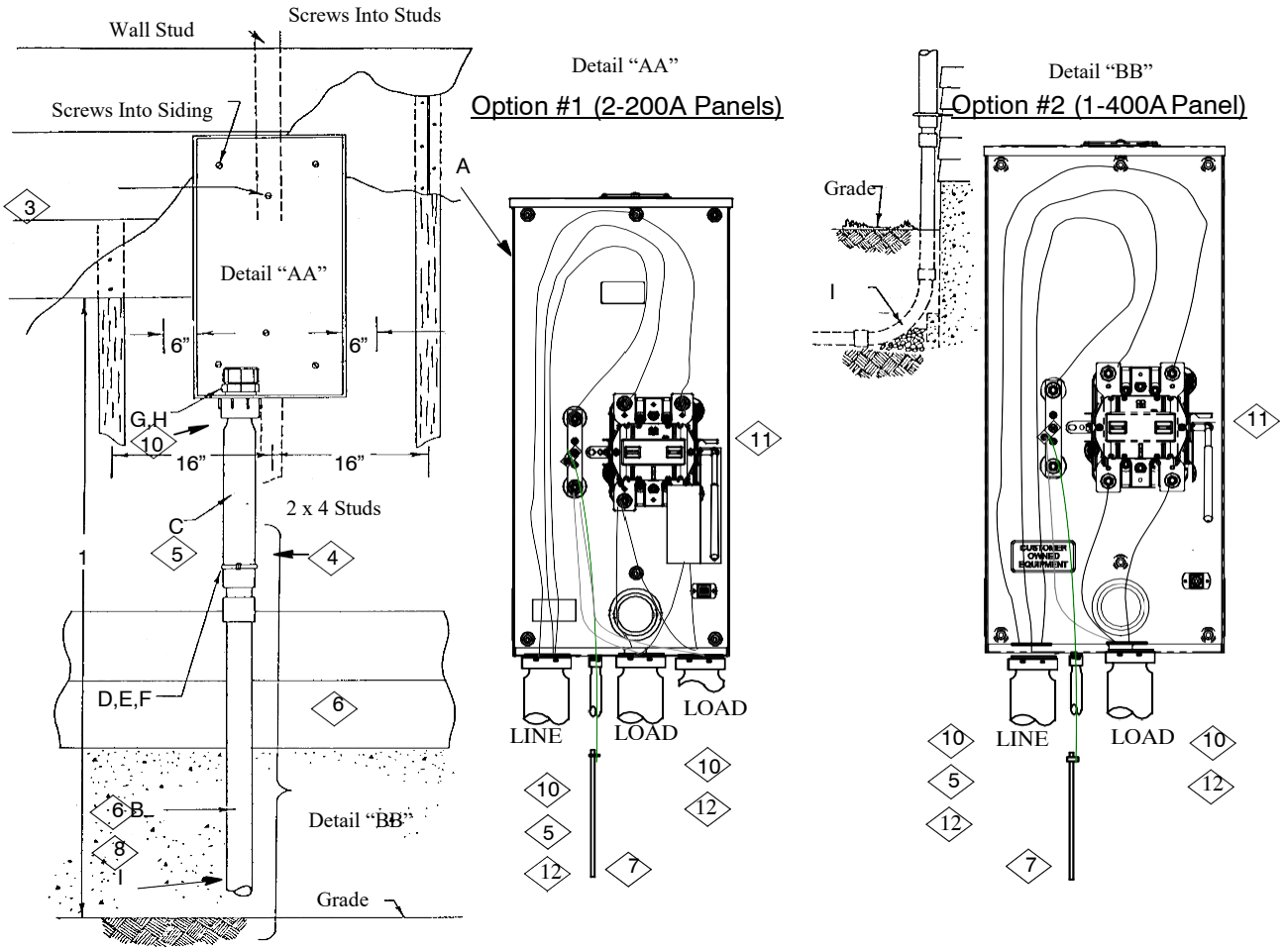
9. Ameren installed supply service conductor and Customer owned supply service conductor will only enter through the bottom left-hand knockout. No load side meter wiring is permitted on the left-hand side of the enclosure where the conduit that would contain Ameren's / Customer's supply service conductor enters the enclosure. The area must be kept clear to permit installation and potential replacement of supply service conductor and to eliminate the possibility of premature failure due to conductors coming in contact with each other. If improper wiring is performed, the supply service conductor will NOT be installed by Ameren.

10. Customer owned and installed service conduit drainage at meter or pole if required, refer to **ASM Figure 700-9**.

SINGLE SERVICE INSTALLATION
RESIDENTIAL / NON-RESIDENTIAL (SINGLE PHASE 200 AMP)
Figure 700-1

NOTE	ITEM	DESCRIPTION – MATERIAL LIST FOR FIGURE 700-1
1	A	Meter Socket, Clamp Jaw Lever Bypass. Refer to **BuildWithAmeren.com**
	B	Conduit, Electrical Grade Sch 80 PVC, 2-1/2 in.
5	C	Coupling, Expansion, Sch 40, PVC, 2-1/2 in. with 12 in. fall
	D	Hanger, Conduit
	E	Screw, Lag
	F	Shield, Expansion
	G	Nut, Lock, 2-1/2 in.
	H	Insulated (or PVC) Bushing, Conduit 2-1/2 in.
8	I	Bend (Sweep), Conduit, 90 Deg., 36 in. Radius, electrical grade Sch 80, PVC, 2-1/2in when required. 24 in radius bends are permitted where rock or foundation problems exist.

SINGLE SERVICE INSTALLATION
RESIDENTIAL / NON-RESIDENTIAL
SINGLE PHASE 320 AMP CONTINUOUS / 400 AMP MAX
Figure 700-2



SINGLE SERVICE INSTALLATION
RESIDENTIAL / NON-RESIDENTIAL
SINGLE PHASE 320 AMP CONTINUOUS / 400 AMP MAX
Figure 700-2

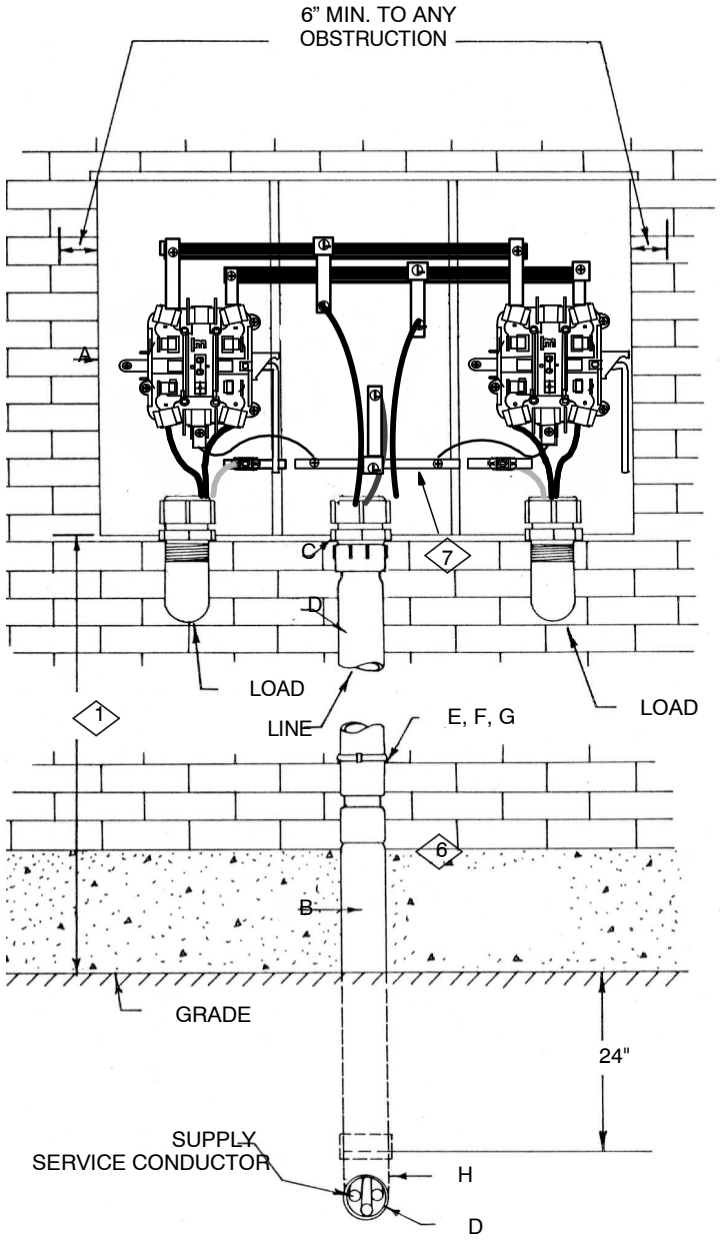
CONSTRUCTION NOTE(s): (FIGURE 700-2):

1. See **ASM Section 200** for mounting height, approved locations, and requirements for mechanical protection.
2. All materials except the supply conductors shall be furnished, installed, and connected by customer.
3. The meter socket shall be secured to solid wood, use #14 x 3 in. wood screws or stainless-steel screws. In brick, use expansion shields and lag screws. No drywall screws accepted.
4. The conduit hanger shall be securely fastened, preferably by a lag screw into the floor joist. If attached to the foundation, a lead expansion shield shall be used. An alternative to the expansion shield is a stud shot into the foundation.
5. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser). The expansion coupling should be installed with the outer sleeve fitted into the meter socket with the inner sleeve positioned at the manufacturer's midway mark.
6. The area underneath the bend (sweep) shall consist of good quality fill material and dirt free of debris. The area shall be compacted around the foundation wall. Acceptable fill materials: sand, limestone screenings, concrete slurry, or concrete.
7. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
8. For services 201 amperes to 320 amperes continuous / 400 amperes max, 3 in. electrical grade PVC conduit, expansion coupling, bends (sweeps), and connectors shall be used. Minimum radius bend (sweep) is 36 in., EXCEPT where rock or foundation limit the installation to 24 in. Radius bends (sweeps).
9. All conduits on a pole will require standoff brackets, supplied by Ameren.
10. The supply side service conductors coming from Ameren facilities will only enter through the bottom left-hand knockout. No load side conductors of the meter wiring are permitted on the left-hand side of the socket where the supply conduit enters the meter socket. The area must be kept clear to permit installation and potential replacement of supply conductor and to eliminate the possibility of premature failure due to conductors coming in contact with each other. If improper wiring is performed, the service installation will NOT be energized.
11. Not more than one conductor per lug barrel unless the lug is designed and UL or ETL approved for more than one conductor.
12. Customer owned and installed service conduit drainage at meter or pole if required, refer to **ASM Figure 700-9.**

SINGLE SERVICE INSTALLATION
RESIDENTIAL / NON-RESIDENTIAL
SINGLE PHASE 320 AMP CONTINUOUS / 400 AMP MAX
Figure 700-2

NOTE	ITEM	DESCRIPTION – MATERIAL LIST FOR FIGURE 700-2
1	A	Meter Socket, Clamp Jaw Lever Bypass Refer to **BuildWithAmeren.com**
	B	Conduit, Electrical Grade Sch 80 PVC, 3 in.
5	C	Coupling, Expansion, Sch 40, PVC, 3 in., 8 in. fall
	D	Hanger, Conduit
	E	Screw, Lag
	F	Shield, Expansion
	G	Nut, Lock, 3 in.
	H	Insulated (or PVC) Bushing, Conduit 3 in.
8	I	Bend, Conduit, 90 Deg., 36in. Radius, Electrical Grade Sch 80, PVC, 3 in.

MULTIPLE SERVICE INSTALLATIONS FOR 2 To 6 METER SINGLE PHASE
Figure 700-3



MULTIPLE SERVICE INSTALLATIONS FOR 2 To 6 METER SINGLE PHASE Figure 700-3

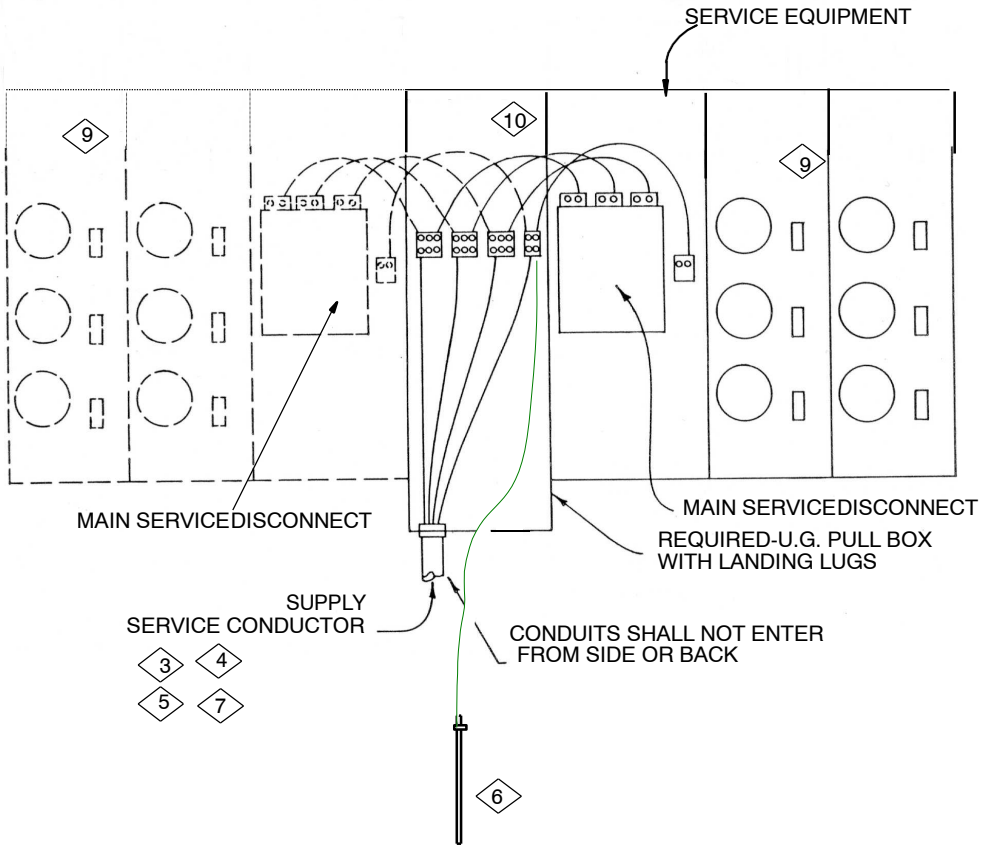
CONSTRUCTION NOTE(s): (FIGURE 700-3)

1. See **ASM Section 200** for mounting height, approved locations, premises labels, and requirements for mechanical protection.
2. In Missouri, all material except supply service conductors shall be furnished by the customer where there are two to six meters for residential installations. For non-residential installation, it's the customer's responsibility to install, own and maintain all material including the supply service conductor.
3. In Illinois, refer to **ASM Section 700.02 (B) 9 and ASM Section 700.02(B) 10** to determine who installs, owns, and maintains the supply service conductor.
4. When concrete sidewalks, driveways, patios, etc. are located within 3 ft of meter location, extend continuous conduit from the meter riser to 12 in. beyond the edge of pavement. In the scenario above and with continuous conduit systems, an expansion coupling is required below the meter socket.
5. Where authorized by local inspection authorities, rigid metal conduit (RMC) may be used, with necessary male adapter, lock nut, and insulated bonded bushing in the enclosure, and the bell end fitting at the lower end of the riser may be substituted for the bushing and the lock nut.
6. Sweeps are to be installed where the footing provides an obstruction to or possible mechanical damage to supply service conductor entrance in the meter riser. No triple 90 degrees bends (sweeps).
7. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
8. Services 200 amperes or less, the conduit riser shall be 2-1/2 in. schedule 80 electrical grade PVC. The expansion coupling, connectors, and bends (sweeps) shall be schedule 80 electrical grade PVC. Minimum bend (sweep) radius is 36 in. for 2-1/2 in. conduit. Where limitations encountered from rock or foundations prevent using 36 in. bends (sweeps), then 24 in. bends (sweeps) are allowed. For service greater than 200 amperes, the conduit size must be increase or use parallel runs.
9. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser). The expansion coupling should be installed with the outer sleeve fitted into the meter socket with the inner sleeve positioned at the manufacturer's midway mark.
10. Permanently marked “Premise Labels” are required for each tenant and adhered adjacent to the breaker. Refer to **ASM Section 200.01 Note 7.**
11. When service conduit drainage is required, the Customer will own and install this material at the meter or pole. Refer to **ASM Figure 700-9.**

MULTIPLE SERVICE INSTALLATIONS
2 To 6 Meters Single Phase Only
Figure 700-3

NOTE	ITEM	DESCRIPTION – MATERIAL LIST FOR FIGURE 700-3
1	A	Meter Socket, Clamp Jaw Lever Bypass. Refer to **BuildWithAmeren.com**
8	B	Conduit, Electrical Grade Sch 80 PVC, 2-1/2 or 3 in.
	C	Nut, Lock, 2-1/2 or 3 in.
8	D	Coupling, Expansion, Sch 40, PVC, 2-1/2 in. Conduit with 12 in fall or 3 in. Conduit with 8 in. fall
	E	Bushing, Conduit, Insulating
	F	Conduit, Straps, Galv.
	G	Screw, Lag
8	H	Bend (sweep), Conduit, 90 Deg., 36 in. Radius, Electrical Grade Sch 80, PVC, 2-1/2 or 3 in.

TYPICAL VERTICAL GANGED METER STACK; UNDERGROUND SERVICE 4, 5, OR 7 TERMINAL METER SOCKET ONE OR TWO MAIN SERVICE DISCONNECT(S)
Figure 700-4



TYPICAL VERTICAL GANGED METER STACK; UNDERGROUND SERVICE 4, 5, OR 7 TERMINAL METER SOCKET ONE OR TWO MAIN SERVICE DISCONNECT(S) Figure 700-4

CONSTRUCTION NOTE(s): (FIGURE 700-4)

1. See **ASM Section 200** for mounting height, approved location, Premises Labels, and requirement for mechanical protection.
2. In Missouri:

   * Residential - Ameren provides supply service conductor, and Ameren must review and approve installation for conductor pulling and landing.

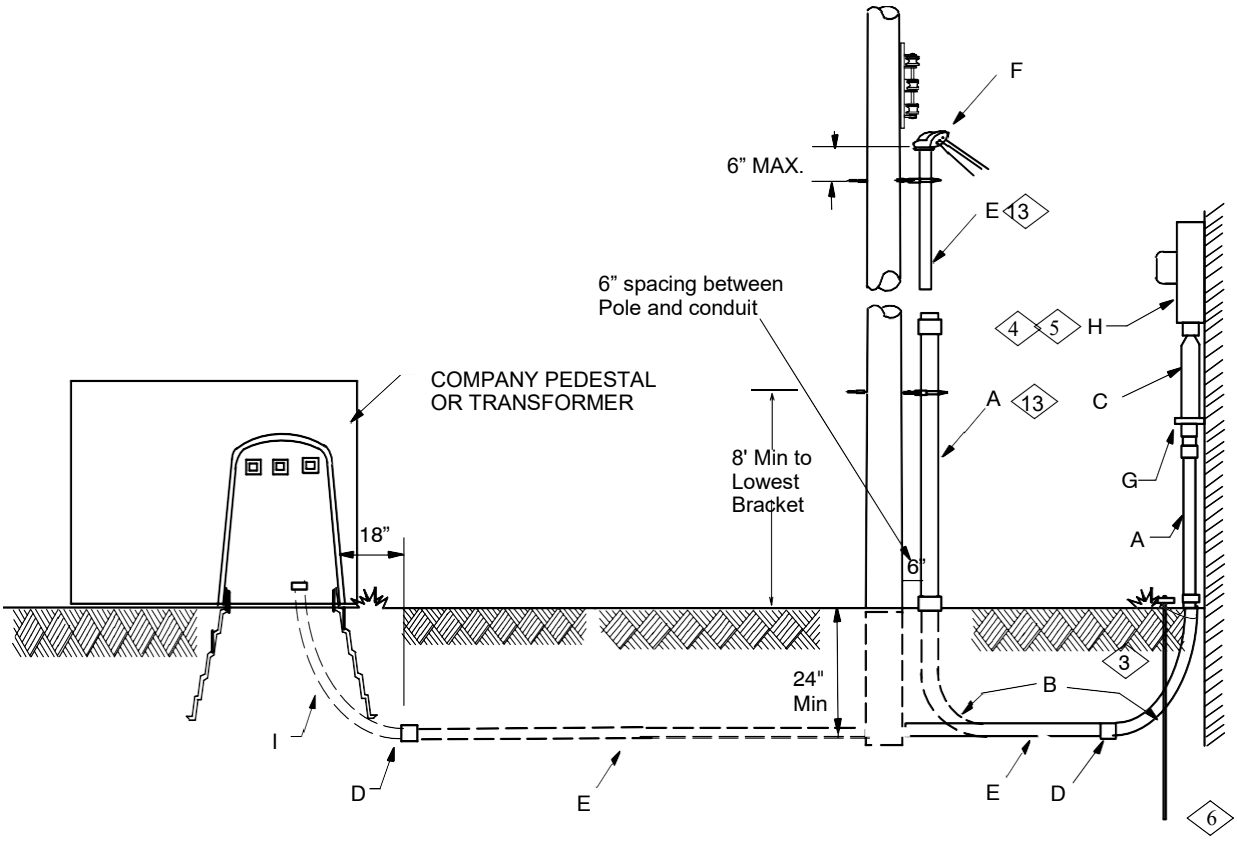
   * Non-residential - Customer provides, installs, and maintains supply service conductors.

   In Illinois:

   * Residential - Customer provides, installs, and maintains supply service conductors for more than two residential.

   * Non-residential - Customer provides, installs, and maintains supply service conductors.
3. When concrete sidewalks, driveways, patios, etc. are located within 3 ft of meter location, extend continuous conduit from the meter riser to the edge of pavement. In the scenario above and with continuous conduit systems, an expansion coupling is required below the meter socket.
4. Where authorized by local inspection authorities, rigid metal conduit (RMC) may be used, with necessary male adapter, lock nut, and insulated bonded bushing in the enclosure, and the bell end fitting at the lower end of the riser may be substituted for the bushing and the lock nut.
5. Customer installed conduit shall be installed along the shortest route, and the number of bends shall be kept to a minimum. There shall be a maximum of 3 - 90^0, 36 in. radius bends (sweeps), EXCEPT where rock or foundations limit the installation to 24 in. radius bends (sweeps). Conduit bends (sweeps) may be installed where the footing provides an obstruction to or possible mechanical damage to service conductor entrance in the meter riser.
6. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
7. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser). The expansion coupling should be installed with the outer sleeve fitted into the meter socket with the inner sleeve positioned at the manufacturer's midway mark.
8. Ameren to seal lids on main service disconnect panel(s), pull box section, and meter cover to prevent public access to the un-metered section.
9. Permanently marked “Premise Labels” are required for each tenant and adhered adjacent to the breaker. See **ASM Section 200.01, Note 7**.
10. Conductor connection from landing lugs to service disconnect(s) by Customer.
11. When service conduit drainage is required, the Customer will own and install this material at the meter or pole. Refer to **ASM Figure 700-9.**

AMEREN SERVICE CONDUCTOR - CONTINUOUS SERVICE CONDUIT INSTALLATION RESIDENTIAL CUSTOMERS - ILLINOIS ONLY
Figure 700-5



CONSTRUCTION NOTE(s): (FIGURE 700-5)

1. Customer installed conduit shall be installed along the shortest route, and the number of bends (sweeps) shall be kept to a minimum. There shall be a maximum of 3 - 90-degree, 36 in. min radius bends (sweeps) for 2-1/2 in. or 3 in. conduit installations, EXCEPT where rock or foundations limit the installation to 24 in. radius bends (sweeps). All sections shall be securely fastened together using standard grade cement. Minimum burial depth in trenchable earth is 24 in. In rock or untrenchable soil, depth may be reduced to 12 in. depths less than 12 in. are not permitted.
2. The trench bottom shall be undisturbed, firm, and uniform for its entire length. If it is impossible to achieve uniformity in the trench bottom it must be over-excavated 4 in. to 6 in. and the bottom refilled with good quality properly compacted bedding material. Approved materials: sand, limestone screening, concrete slurry, or concrete.
3. Conduit seals on customer service conduit are the customer responsibility and should be installed at the building wall.

AMEREN SERVICE CONDUCTOR - CONTINUOUS SERVICE CONDUIT INSTALLATION RESIDENTIAL CUSTOMERS - ILLINOIS ONLY Figure 700-5

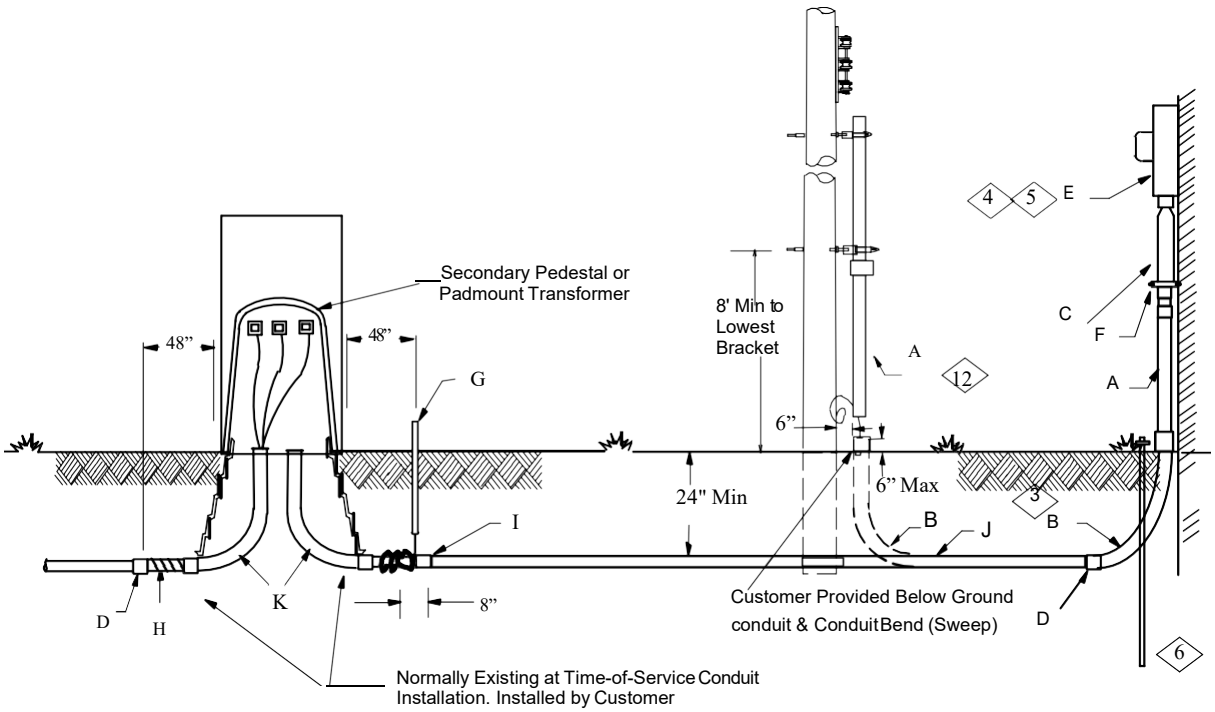
CONSTRUCTION NOTE(s): (FIGURE 700-5) (CONTINUED)

4. Refer to **ASM Figure 700-1** for required meter socket and riser attachment.
5. Refer to **ASM Section 200** for meter socket mounting height.
6. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
7. If Ameren pole, pedestal, or padmount transformer is not in place, the location where it will be installed shall be obtained from Company representative before conduit installation. The customer shall seal and mark the conduit end nearest the proposed Ameren equipment.
8. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser). The expansion coupling should be installed with the outer sleeve fitted into the meter socket with the inner sleeve positioned at the manufacturer's midway mark.
9. For continuous customer conduit systems, the pole riser conduit must have a weather-head supplied by customer.
10. Any Conduits on a pole will require standoff brackets, supplied by Ameren.
11. Customer owned and installed service conduit drainage at meter or pole if required, refer to ASM **Figure 700-9**.
12. For Customer installed continuous conduit extensions to overhead poles, Company will designate the quadrant of the pole for the customer to stub up the conduit bend (sweep). Actual installation of the conduit varies by Ameren area. Contact your local Ameren representative for direction.
13. Customer shall provide, install, and secure at each end a polyester pulling tape of 2500 lb. capacity when access inside Ameren equipment is not needed. Pulling tape must be extended a minimum of 10 ft beyond each end of the conduit system. Ameren personnel will be responsible for providing and installing the pulling tape when access inside Ameren equipment is required to complete installation.
14. 200 ampere service requires 2 -1/2 in. conduit, and 320 amperes continuous / 400 amperes max requires 3 in. conduit.
15. Customer is required for locations where Ameren supplies the service cable to supply the conduit at the pole for residential continuous conduit applications. Ameren will supply and install the standoff brackets. The first 10 ft of conduit must be schedule 80 on pole, and the remainder up pole can be schedule 40.

AMEREN SERVICE CONDUCTOR - CONTINUOUS SERVICE CONDUIT INSTALLATION RESIDENTIAL CUSTOMERS - ILLINOIS ONLY
Figure 700-5

NOTE	ITEM	DESCRIPTION – MATERIAL LIST FOR FIGURE 700-5
	A	Conduit - Electrical Grade Sch. 80 PVC for first 8 ft above grade
3	B	Bend (Sweep) - Conduit 36 in. Min, 90 Deg. Radius, Electrical Grade Sch. 80, PVC
7	C	Expansion Coupling (allow 12 in. fall for 2-1/2 in. Conduit or 8 in. Fall for 3 in. Conduit) Electrical Grade Sch. 40, PVC
	D	Coupling-Conduit, Electrical Grade Sch. 40, PVC
	E	Conduit - Electrical Grade Sch. 40 PVC
	F	Weather-head
	G	Hanger-Conduit
	H	Meter Socket, Clamp Jaw Lever Bypass. Refer to **BuildWithAmeren.com**
	I	Bend (Sweep) - Conduit 36 in. Min. 90 Deg Radius, Electrical Grade Sch 40, PVC

CUSTOMER OWNED AND INSTALLED SERVICE CONDUIT: RESIDENTIAL SUBDIVISION - MISSOURI ONLY Figure 700-6



CONSTRUCTION NOTE(s): (FIGURE 700-6)

1. Customer installed conduit shall be installed along the shortest route and the number of bends (sweeps) shall be kept to a minimum. There shall be a maximum of 3 - 90^0, 36 in. min radius bends (sweeps) for any installation. All sections shall be securely fastened together using standard grade cement, EXCEPT where rock or foundations limit the installation to 24 in. radius bends (sweeps). For untrenchable soil, depth may be reduced to 12 in, and depths less than 12 in. are not permitted. For services 200 amperes or less, 2-1/2 in. electrical grade PVC conduit, expansion coupling, bends (sweeps), and connectors shall be used. For 201 amperes to 320 amperes continuous / 400 amperes max, 3 in. electrical grade PVC conduit, expansion coupling, bends (sweeps), and connectors shall be used. Minimum bend radius is 36 in. for 2-1/2 or 3 in. Conduit, EXCEPT where rock or foundations limit the installation to 24 in. radius bends (sweeps).

2. The trench bottom shall be undisturbed, firm, and uniform for its entire length. If it is impossible to achieve uniformity in the trench bottom it must be over-excavated 4 to 6 in. and the bottom refilled with good quality properly compacted bedding material. Approved materials: sand, limestone screenings, concrete slurry, or concrete.

3. Conduit seals on customer service conduit are the customer's responsibility and should be installed at the building wall.

CUSTOMER OWNED AND INSTALLED SERVICE CONDUIT: RESIDENTIAL SUBDIVISION - MISSOURI ONLY Figure 700-6

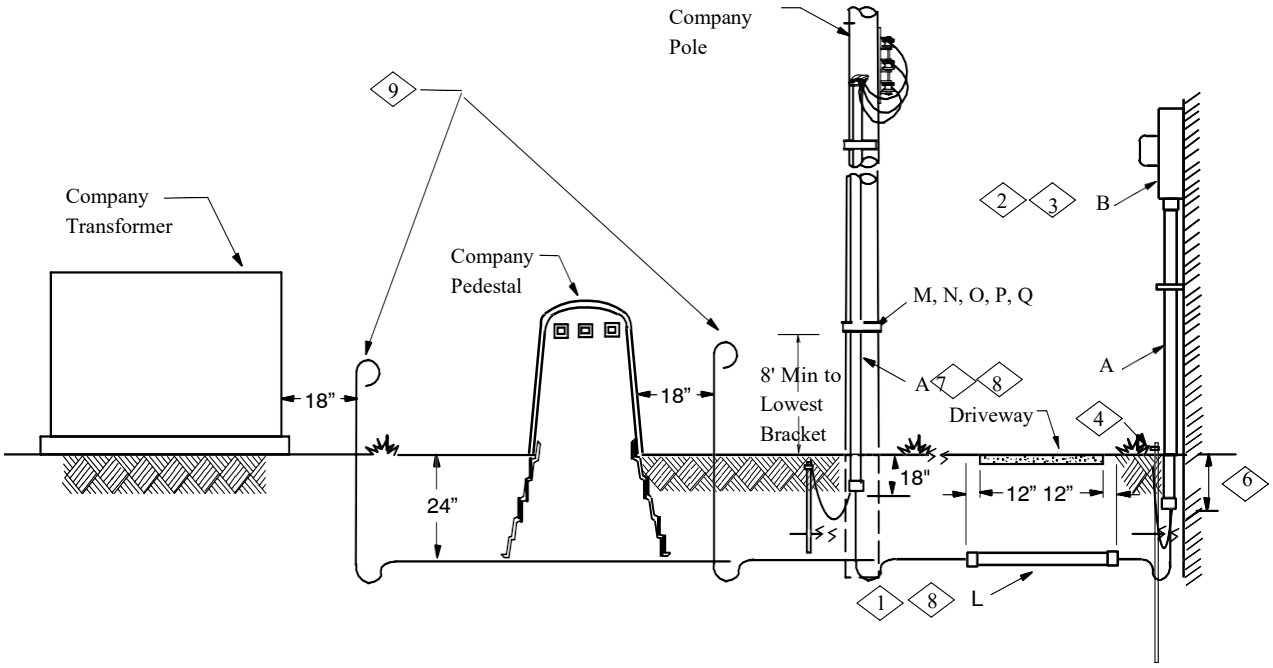
CONSTRUCTION NOTE(s): (FIGURE 700-6) (CONTINUED)

4. See **ASM Figure 700-1** for required meter socket and riser attachment.
5. See **ASM Section 200** for meter socket mounting height.
6. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
7. If Ameren pole, pedestal, or transformer is not in place, the location where it will be installed shall be obtained from Company representative before conduit installation. The customer shall seal and mark the conduit end nearest the proposed Ameren equipment.
8. Contractor installed flexible conduit shall point in the direction of the service. The conduit will extend 48 in. beyond the edge of the pedestal or transformer pad. End is marked with red tape or similar manner.
9. To attach the conduit to the previously installed flexible conduit, first locate the end of the conduit by digging down by the red marker until the protective PVC cover is located. After removing the cover, plug, and conduit marker, join the flexible conduit to the rigid conduit using standard grade cement. In cases where the service conduit and conduit stubbed out of a pedestal or transformer differ in size, the customer will be responsible for making the conduit connection.
10. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser). The expansion coupling should be installed with the outer sleeve fitted into the meter socket with the inner sleeve positioned at the manufacturer's midway mark.
11. For customer conduit extensions to overhead poles, Company will designate the quadrant of the pole for the customer to stub up the conduit bend (sweep). Actual installation of the conduit varies by Ameren area. Contact your local Ameren representative for direction.
12. For customer conduit extensions to overhead poles, Company will designate the quadrant of the pole for the customer to stub up the conduit bend (sweep). Actual installation of the conduit varies by Ameren area. Contact your local Ameren representative for direction.
13. Ameren provides and installs the conduit riser up the pole, and the first 10 ft of conduit on the pole must be schedule 80, and remainder up pole can be schedule 40.
14. Customer owned and installed service conduit drainage at meter or pole if required, refer to **ASM Figure 700-9**.
15. Customer shall provide, install, and secure at each end a polyester pulling tape of 2500 lb. capacity when access inside Ameren equipment is not needed. Pulling tape must be extended a minimum of 10 ft beyond each end of the conduit system. Ameren personnel will be responsible for providing and installing the pulling tape when access inside Ameren equipment is required to complete installation.

CUSTOMER OWNED AND INSTALLED SERVICE CONDUIT: RESIDENTIAL SUBDIVISION - MISSOURI ONLY
Figure 700-6

NOTE	ITEM	DESCRIPTION - Material List for Figure 700-6
12	A	Conduit - Electrical Grade Sch. 80 PVC, 2-1/2 or 3 in.
3	B	Bend (sweep) - Conduit 2-½ or 3 in., 90 Deg, 36 in. min Radius, Electrical Grade Sch. 80, PVC
10	C	Expansion Coupling, 2-½ in. or 3 in. (allow 8 in. fall) Electrical Grade Sch 40 PVC
1	D	Coupling-Conduit, 2-½ in. or 3 in., Electrical Grade Sch 40, PVC
	E	Meter Socket, Clamp Jaw Lever Bypass. Refer to **BuildWithAmeren.com**
	F	Hanger-Conduit
	G	Marker-Buried Conduit, Red, 1 in w x 7 ft - 4 in L
	H	Conduit Plastic Flexible, Corrugated, 2-½ in. or 3 in.
	I	Plug-Conduit, 2-½ in. or 3 in.
1	J	Conduit - Electrical Grade Sch. 40 PVC or greater, 2-½ or 3 in.
	K	Bend (sweep) - conduit 2-1/2 or 3 in., 90 Deg, 36 in. Min Radius, Electrical Grade Sch 40, PVC

CUSTOMER OWNED AND INSTALLED, DIRECT BURIED SERVICE CONDUCTOR; CONNECTION TO PEDESTAL, PADMOUNT TRANSFORMER, OR POLE: NON-RESIDENTIAL - ILLINOIS ONLY
Figure 700-7



CONSTRUCTION NOTE(s): (FIGURE 700-7)

1. The trench bottom shall be undisturbed, firm, and uniform for its entire length. If it is impossible to achieve uniformity in the trench bottom it must be over-excavated 4 to 6 in. and the bottom refilled with good quality properly compacted bedding material. Approved materials: Sand, limestone screening, concrete slurry, or concrete.
2. Refer to **ASM Figure 700-1** for required meter socket and riser attachment.
3. Refer to **ASM Section 200** for meter socket mounting height.
4. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500.**
5. If Ameren equipment is not in place, the location where it will be installed shall be obtained from Company representative before conduit installation.
6. End of riser conduit at side of home / pole should be buried 18” minimum depth.

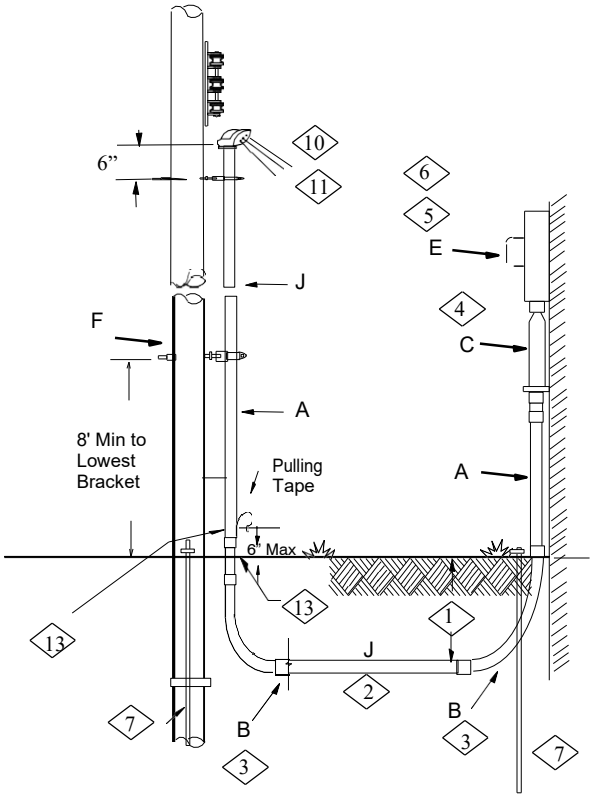
CUSTOMER OWNED AND INSTALLED, DIRECT BURIED SERVICE CONDUCTOR; CONNECTION TO PEDESTAL, PADMOUNT TRANSFORMER, OR POLE: NON-RESIDENTIAL - ILLINOIS ONLY
Figure 700-7

CONSTRUCTION NOTE(s): (FIGURE 700-7) (CONTINUED)

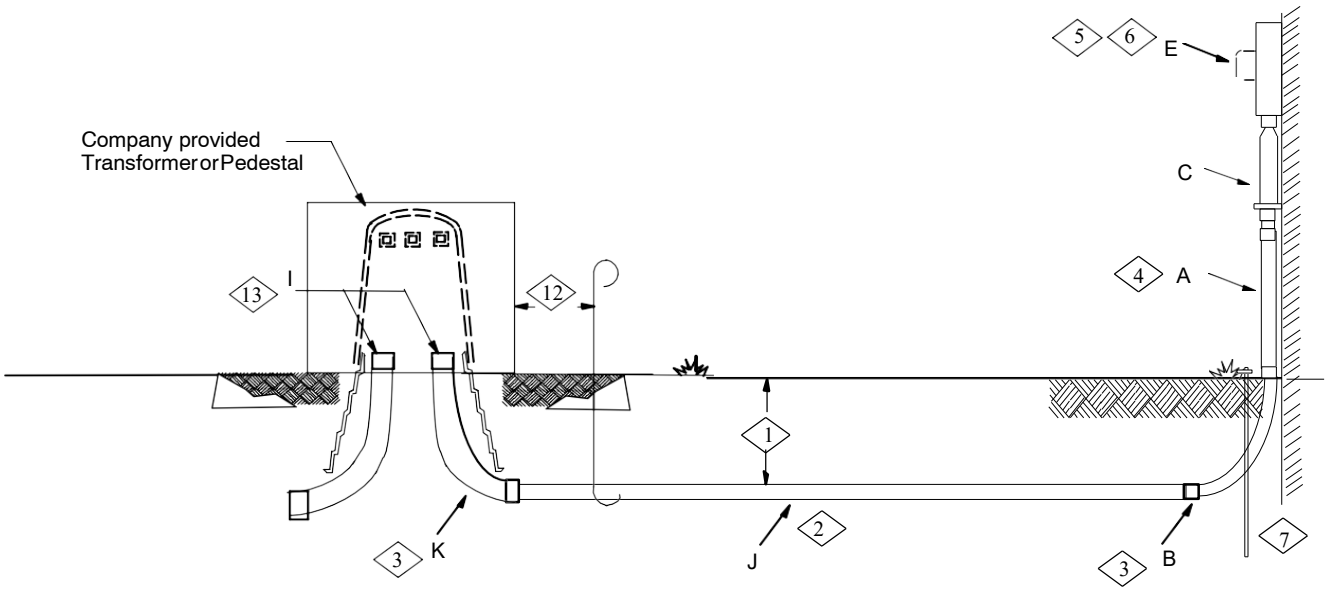
7. Customer is required to supply the conduit at the pole for non-residential direct buried applications. Ameren will supply and install the standoff brackets. The first 10 ft of conduit must be schedule 80 on pole, and the remainder up pole can be schedule 40.
8. For single phase, 200 ampere service requires 2-½ in. conduit, and for three phase, conduit size determined by conductor selection.
9. Customer to leave enough conductor for Company to make connections inside pedestal or transformer (Refer to **ASM Section 700.03**)

	ITEM	DESCRIPTION - Material List for Figure 700-7
7,8	A	Conduit - Electrical Grade Sch. 80 PVC
	B	Meter Socket - Clamp Jaw Lever Bypass Refer to **BuildWithAmeren.com**
8	L	Conduit - Electrical Grade Sch. 40 PVC
7	M	Bracket - Standoff, ½ in.
	N	Strap - Conduit
	O	Bolt - Arming Double, ⅝ in. x 18 in.
	P	Jam Nut - ⅝ in.
	Q	Washer - Curved, ¾ in.

CUSTOMER OWNED AND INSTALLED SERVICE CONDUCTOR & CONTINUOUS CONDUIT SYSTEM: CONNECTION AT POLE - NON-RESIDENTIAL
Figure 700-8A



CUSTOMER OWNED AND INSTALLED SERVICE CONDUCTOR IN CONTINUOUS CONDUIT SYSTEM: CONNECTION AT PEDESTAL, PADMOUNT TRANSFORMER FOR ALL VOLTAGES: NON-RESIDENTIAL
Figure 700-8B



CONSTRUCTION NOTE(s): (FIGURE 700-8A & 8B)

Meter Socket on side of structure is representative of both self-contained and instrument rated metering installations.

1. Customer installed conduit shall be installed along the shortest route, and the number of bends (sweeps) shall be kept to a minimum. There shall be a maximum of 3 - 90°, 36 in. min radius conduit bends (sweeps). All sections shall be securely fastened together using standard grade cement. For burial depths, refer to **NEC, Article 300.5.** Conduit installation for **Ameren Illinois** can be found: "**SPECIFICATIONS FOR CUSTOMER-INSTALLED UNDERGROUND DISTRIBUTION FACILITIES (NON-RESIDENTIAL)",** and **Ameren Missouri** can be found: **"SPECIFICATION FOR CUSTOMER AND AMEREN CONTRACTOR INSTALLED UNDERGROUND DISTRIBUTION FACILITIES (NON-RESIDENTIAL)".**
2. The trench bottom shall be undisturbed, firm, and uniform for its entire length. If it is impossible to achieve uniformity in the trench bottom it must be over-excavated 4 to 6 in. and the bottom refilled with good quality properly compacted bedding material. Approved materials: Sand, limestone screening, concrete slurry, or concrete.
3. Minimum bend (sweep) radius 36 in., EXCEPT where rock or foundations limit the installation to 24 in. radius bend (sweeps).

CUSTOMER OWNED AND INSTALLED SERVICE CONDUCTOR IN CONTINUOUS CONDUIT SYSTEM: CONNECTION AT POLE, PEDESTAL, PADMOUNT TRANSFORMER FOR ALL VOLTAGES: NON-RESIDENTIAL

Figure 700-8A & 8B

CONSTRUCTION NOTE(s): (FIGURE 700-8A & 8B) (CONTINUED)

4. Conduit seals on customer service conduit are the customers responsibility and should be installed on the building wall.
5. Refer to **ASM Figure 700-1** for required meter socket and riser attachment.
6. Refer to **ASM Section 200** for meter socket mounting height.
7. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
8. If Company equipment is not in place, the location where it will be installed shall be obtained from Company representative before conduit installation.
9. Riser conduit at side of building / pole should be buried 24 in. minimum depth.
10. In Illinois, the conduit riser up the pole is provided by the customer. Ameren to provide riser standoff brackets on pole. Ameren to install conduit riser and supply service conductor up the pole and make final connection. The first 10 ft of conduit on the pole must be schedule 80, and reminder up pole can be schedule 40.
11. In Missouri, Ameren provides and installs the conduit riser up the pole, and the first 10 ft of conduit on the pole must be schedule 80, and reminder up pole can be schedule 40.
12. Illinois customer stops at 18 in. away from Ameren transformer or pedestal and shall leave sufficient material for Ameren to extend into the transformer or pedestal.
13. Extend the end of conduit 6 in. above grade and cap or tap with the end of the pulling tape sticking out.
14. Single phase, 200 ampere service requires 2-½ in. conduit, and 320 ampere continuous / 400 ampere max requires 3 in conduit. For three phase, conduit size determined by conductor selection.
15. When service conduit drainage is required, the Customer will own and install this material at the meter or pole. Refer to **ASM Figure 700-9.**

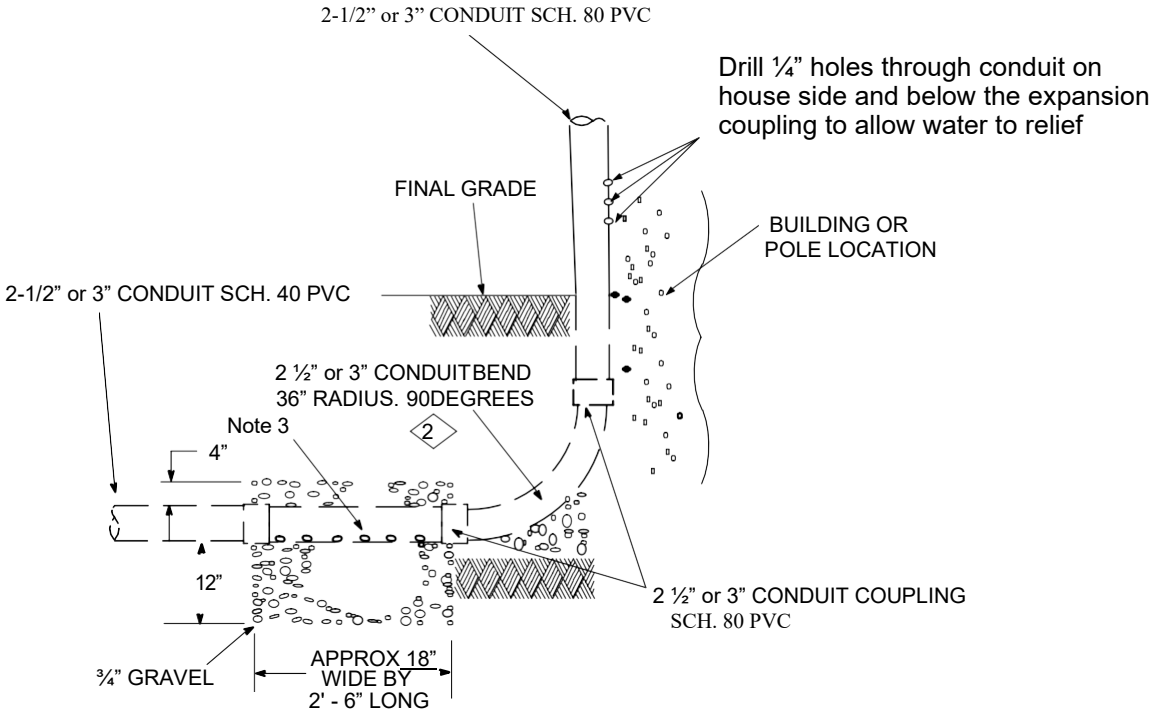
CUSTOMER OWNED AND INSTALLED SERVICE CONDUCTOR IN CONTINUOUS CONDUIT SYSTEM: CONNECTION AT POLE, PEDESTAL, PADMOUNT TRANSFORMER FOR ALL VOLTAGES:

NON-RESIDENTIAL

Figure 700-8A & 8B

NOTE	ITEM	DESCRIPTION – MATERIAL LIST FOR FIGURE 700-8A & 8B
4	A	Conduit - Electrical Grade Sch. 80 PVC
3	B	Bend (sweep) - 90 Deg, 36 in. min Radius, Electrical Grade Sch. 80, PVC
	C	Expansion Coupling, (allow 8 in. fall) Electrical Grade Sch 40 PVC
1	D	Coupling-Conduit, Electrical Grade Sch 40, PVC
	E	Meter Socket, Clamp Jaw Lever Bypass Refer to **BuildWithAmeren.com**
	F	Hanger-Conduit
	G	Marker-Buried Conduit, Red, 1 in. w x 7 ft - 4 in. L
	H	Conduit Plastic Flexible and Corrugated
	I	Plug-Conduit
1	J	Conduit - Electrical Grade Sch. 40 PVC or greater
3	K	Bend (sweep) - 90 Deg, 36 in. min Radius, Electrical Grade Sch 40, PVC

CUSTOMER OWNED AND INSTALLED SERVICE CONDUIT DRAINAGE AT METER OR POLE IF REQUIRED
Figure 700-9

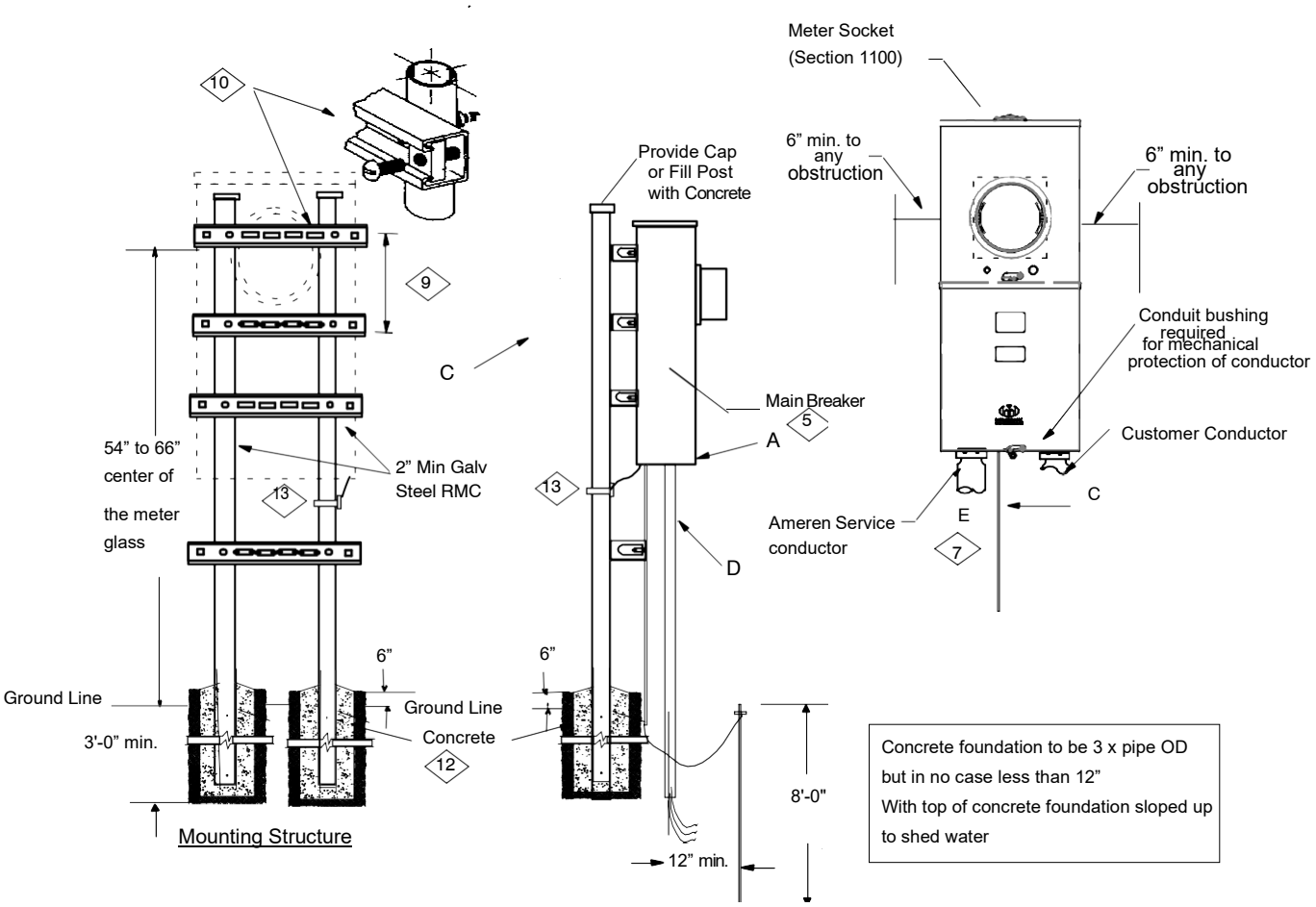


CUSTOMER DRAINAGE INSTALLATION
IF REQUIRED AT METER or POLE

CONSTRUCTION NOTE(s): (FIGURE 700-9)

1. Customer Conduit Installation.
2. 36 in. min radius conduit bends (sweeps) are required unless rock or foundation prevents this size bend (sweep); then 24 in. bend (sweep) is acceptable.
3. Drainage conduit section of conduit containing 6 - ½ in. diameter holes drilled on 4 in. centers. Ream inside of conduit to remove sharp edges.

CUSTOMER PROVIDED METER STRUCTURE
FOR SINGLE POSITION SELF-CONTAINED METER / MAIN DISCONNECT(S)
Figure 700-10



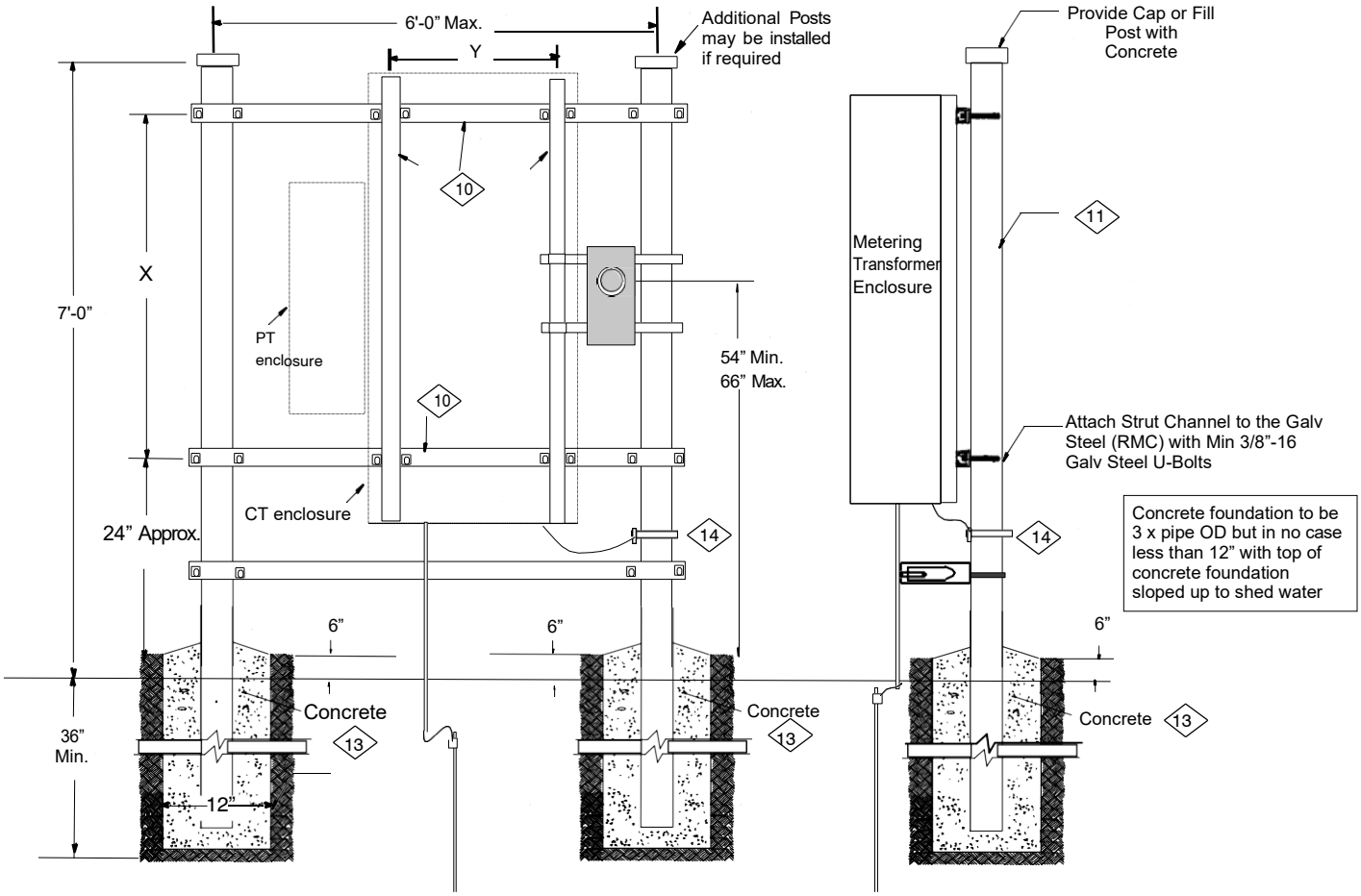
CUSTOMER PROVIDED METER STRUCTURE FOR SINGLE POSITION SELF-CONTAINED METER / MAIN DISCONNECT(S) Figure 700-10

CONSTRUCTION NOTE(s): (FIGURE 700-10)

1. The installation of all entrance equipment, conductors and conduit shall conform to local codes or the latest NEC requirements.
2. All material shall be furnished and installed by customer.
3. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500.**
4. Different arrangements of the service equipment (fuse / breaker box) may be used side-by-side or below meter socket.
5. Refer to **ASM Section 1100** for meter sockets or combo unit's requirement.
6. Refer to **ASM Section 200** for meter socket mounting height.
7. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser).
8. Wooden, stand-alone support structures are not allowed.
9. Space Unistrut channel to match meter socket mounting holes. The meter must maintain 36 in. min to 66 in. max height from the ground line.
10. Provide Unistrut, P1100T, 1-⅝ in. x 1 in., 14 gage, deep slotted channel required to mount metering transformer enclosure.
11. This structure is to be used only for locations that have a self-contained meter socket and main disconnect or where only an instrument rated meter socket is mounted beside a switchboard. For all other locations, refer to **ASM Figure 700-11** for construction of a heavier structure.
12. Foam or loose gravel backfill is not allowed.
13. Extend bonding jumper from meter socket / meter-main combo to the nearest vertical support pipe.

NOTE	ITEM	DESCRIPTION – MATERIAL LIST FOR FIGURE 700-10
5	A	Meter Socket, Clamp Jaw Lever Bypass. Refer to **BuildWithAmeren.com**
	C	½ in. PVC Conduit
	D	Conduit-Electrical Grade Sch 80 PVC
7	E	Expansion Coupling, Sch 40 PVC, 8 in. fall

CUSTOMER PROVIDED STRUCTURE
FOR TWO TO SIX METER POSITIONS AND ASSOCIATED MAIN DISCONNECTS
INSTRUMENT RATED SERVICE INSTALLATION
Figure 700-11



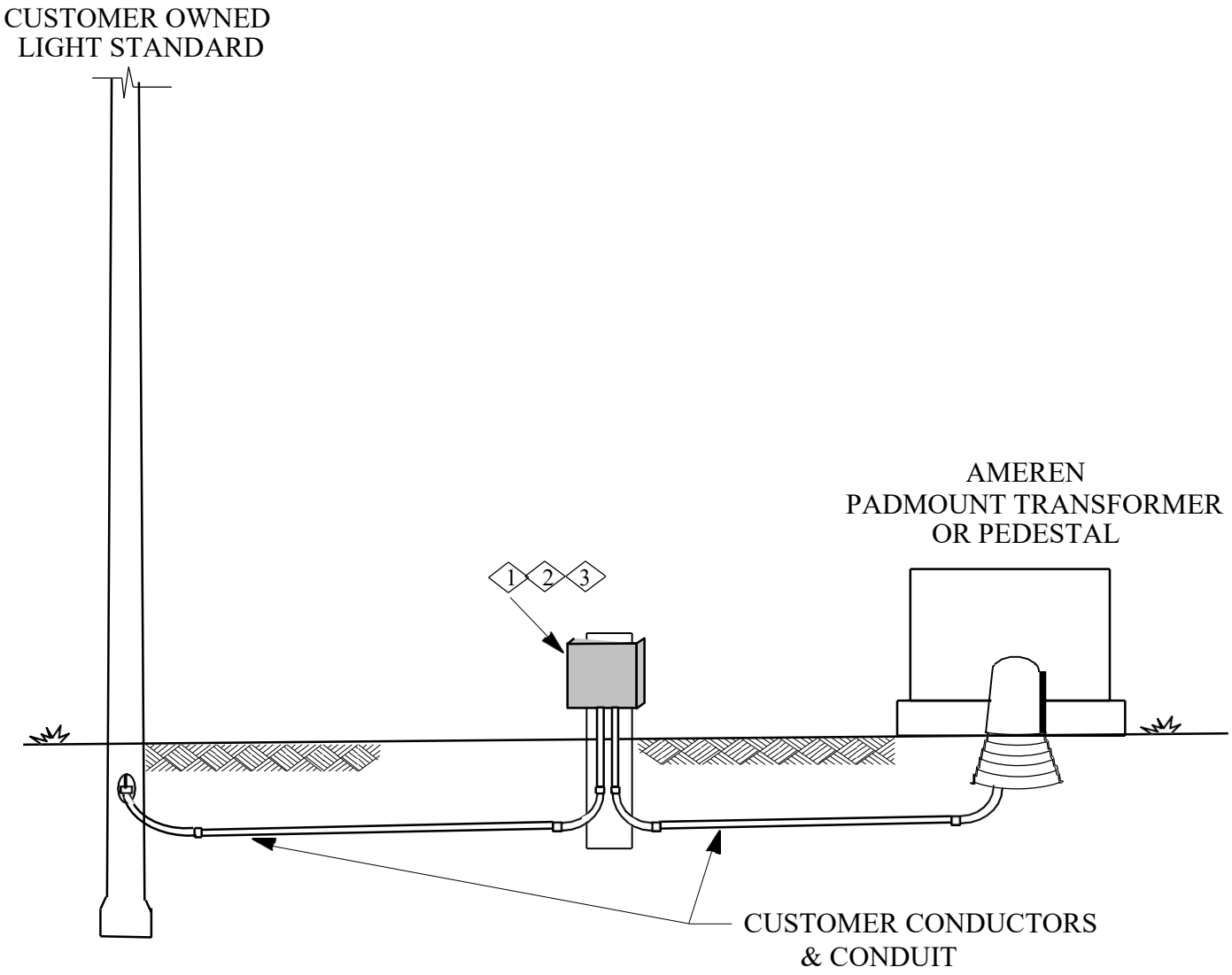
1P/3P 3W Services		3P/4W Services		Services
x	y	x	Y	
24"	12"	24"	20"	400-800A
40"	24"	40"	32"	1200-2000A
54"	32"	54"	40"	2500-3000A

CUSTOMER PROVIDED STRUCTURE
FOR TWO TO SIX METER POSITIONS AND ASSOCIATED MAIN DISCONNECTS
INSTRUMENT RATED SERVICE INSTALLATION
Figure 700-11

CONSTRUCTION NOTE(s): (FIGURE 700-11)

1. Provide protective barrier as needed, Refer to **ASM Figure 200-2**.
2. Meter structure is owned, installed, and maintained by the customer.
3. Located only on customer property.
4. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500.**
5. Refer to **ASM Section 1000** or **BuildWithAmeren.com** for self-contained meter sockets requirements.
6. Refer to **ASM Section 1001** for pad mounted CT enclosure as alternative option.
7. As an alternative to building this CT / PT support structure, a padmount CT / PT, meter socket, or utility metering section in switchboard construction could be used. Refer to **ASM Section 1100** for approved enclosures.
8. Structure may need additional vertical galvanized steel RMC to support customer owned equipment.
9. Meter structures from wooden members will not be acceptable.
10. Provide Unistrut, P1100T, 1-⅝ in. x 1 in., 14 gage, deep slotted channel required to mount metering transformer enclosure.
11. Minimum of 3 in. galvanized steel RMC, 10 ft. long, and set 3 ft. deep in 12 in. diameter hole cast in place footing.
12. An expansion coupling is only required for a continuous conduit system, where bend (sweeps) is buried below the meter socket, and where the riser conduit emerges from grade through a concrete slab that does not have an oversized hole (e.g., concrete not adhered to riser).
13. Foam or loose gravel backfill is not allowed.
14. Extend bonding jumper from CT enclosure / multi - position meter enclosure to the nearest vertical support pipe.

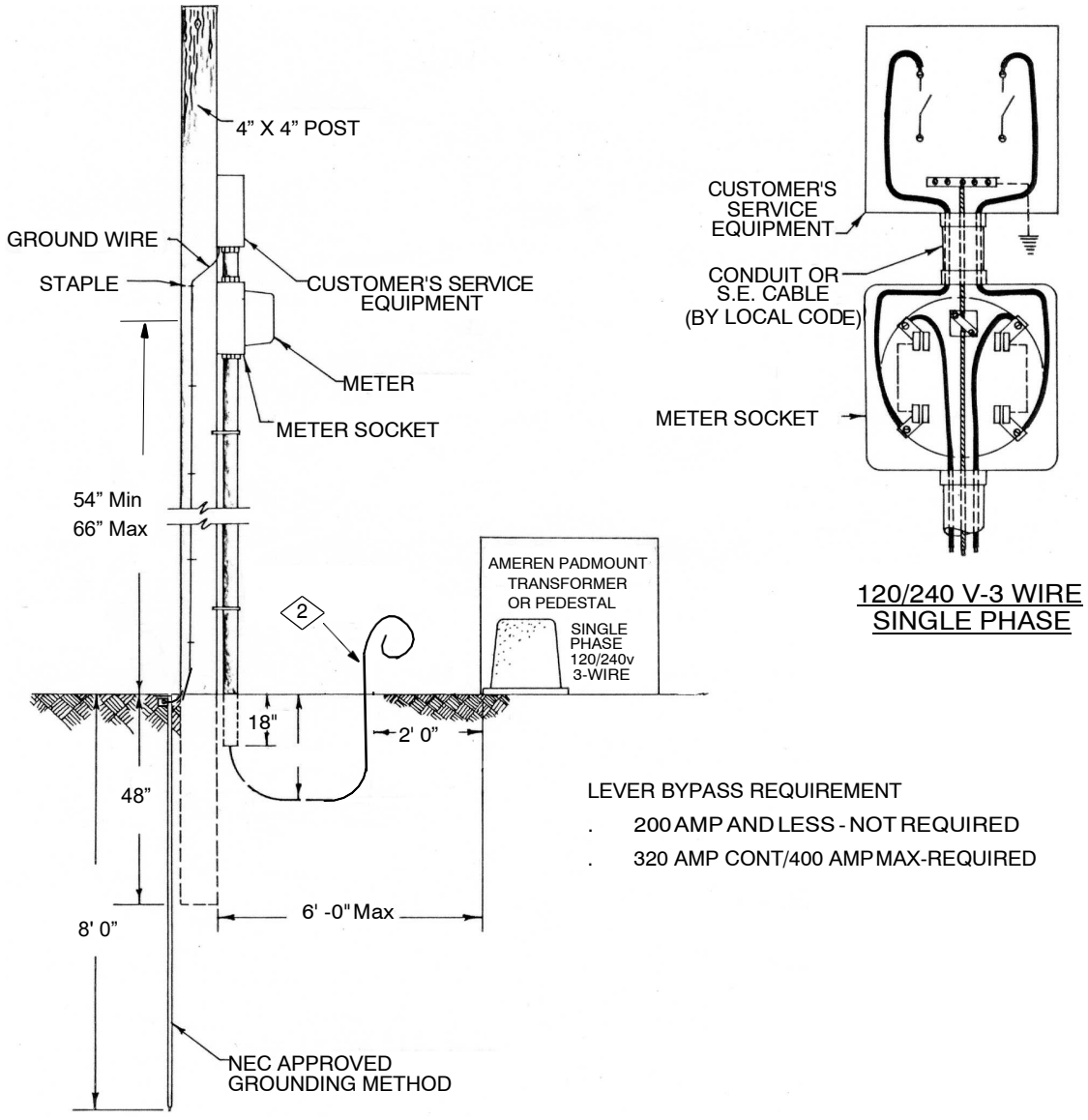
CUSTOMER OWNED LIGHTING (6M)
UNMETERED INSTALLATION - MISSOURI ONLY
Figure 700-12



CONSTRUCTION NOTE(s): (FIGURE 700-12)

1. Customer owned NEMA weathertight enclosure must be lockable.
2. Disconnecting means breaker or fused disconnect location approved by Ameren.
3. No greater than 10 ft and no less than 6 ft from Ameren source and not hinder transformer door operating.
4. Customer to install direct buried cable or cable in conduit into Ameren transformer (refer to **ASM 700.03.C**) or pedestal (refer to **ASM 700.03.D**).

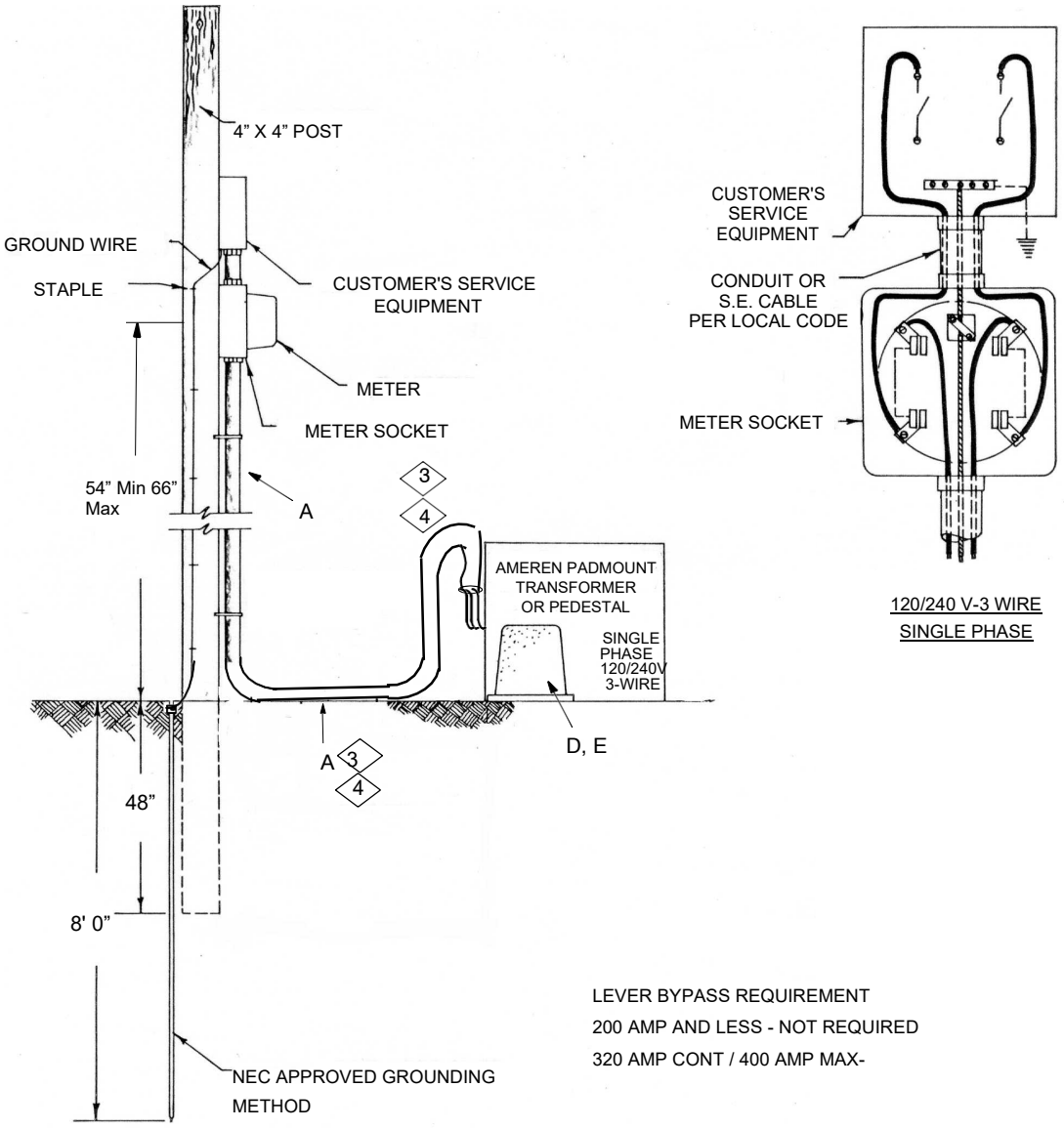
TEMPORARY UNDERGROUND SERVICE – ILLINOIS OR MISSOURI
Figure 700-13



CONSTRUCTION NOTE(s): (FIGURE 700-13)

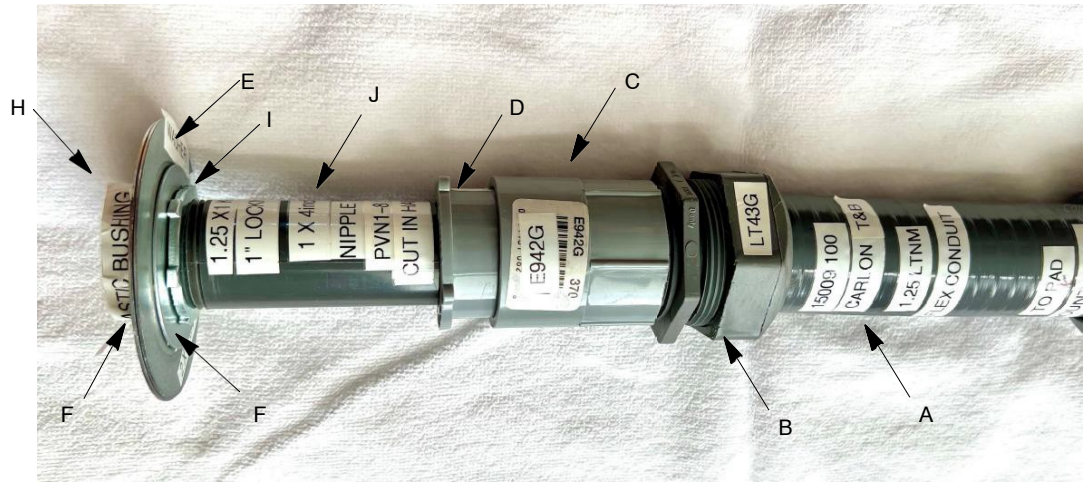
1. Customer's service equipment may be mounted below meter socket, but center of meter socket must be mounted at 54 in. min to 66 in. max above grade. See NEC for GFCI protection.
2. Customer to install 3 wire direct burial conductor from meter base to this point & leave sufficient (8 ft.) length for Ameren to connect to pedestal or transformer.
3. Meter, pedestal, or padmount transformer are provided by Ameren. All other material to be furnished and installed by customer. Refer to **BuildWithAmeren.com** for meter socket requirement.
4. Final connection to be completed by Ameren.

TEMPORARY UNDERGROUND SERVICE - MISSOURI ONLY
Figure 700-14A



TEMPORARY UNDERGROUND SERVICE - MISSOURI ONLY
CUSTOMER PROVIDED CONDUIT CONNECTOR ASSESSORIES
Figure 700-14B

Customer Provided Conduit Connectors Accessories – Connecting to Padmount Transformer or Secondary Pedestal



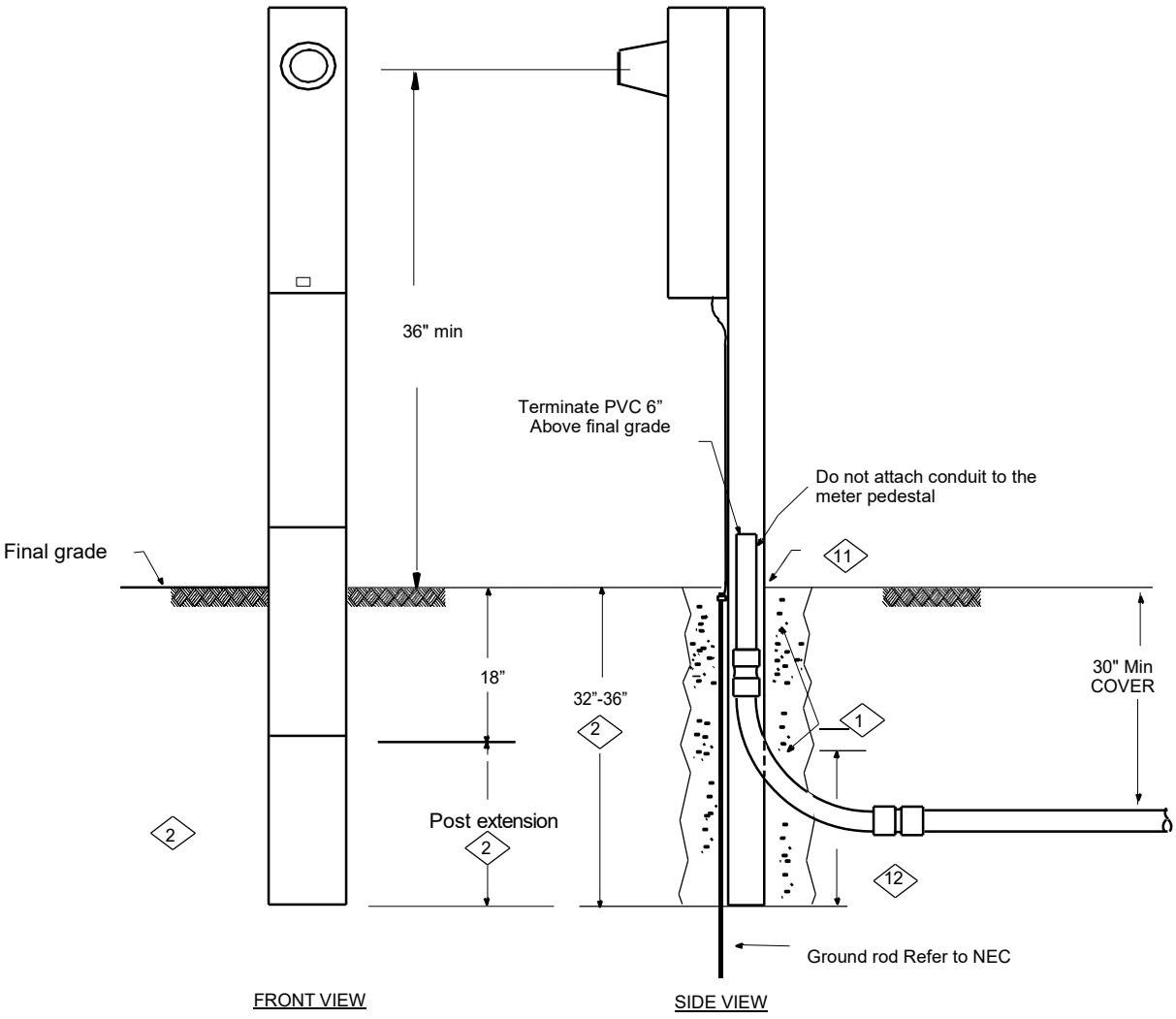
ITEM	DESCRIPTION	(Qty)
A	Conduit, 1-1/4” Liquidtight Flexible Non-metallic Conduit (LFNC) **Carlon T&B Cat #15009-050 (ft)**	10
B	PVC Liquidtight Str Connector, 1-1/4” **Carlon T&B Cat #LT43G**	1
C	Reducer Bushing PVC, 1-1/4” x 1” **Carlon T&B Cat #E942G**	1
D	Female Adapter PVC, 1-1/4” x 1” **Carlon T&B Cat #E950GF**	1
E	Reducing Washers, 2 x 1-1/4” **Bridgeport Fittings Cat #1074**	2
F	Reducer Washer, 1-1/4” x 1” **Bridgeport Fittings Cat #1066**	2
H	Plastic Bushing, 1” **Bridgeport Cat #323**	1
I	Locknut, 1” **Bridgeport Cat #103-S**	2
J	Threaded 1” End Nipple Sch 80, 1” x 4” **Dura Cat #PNIPO100-040**	1

TEMPORARY UNDERGROUND SERVICE – MISSOURI ONLY
CUSTOMER PROVIDED CONDUIT CONNECTOR ASSESSORIES
Figure 700-14A & 14B

CONSTRUCTION NOTE(s): (FIGURE 700-14A & 14B)

1. This option is only allowed in MO for the temporary UG service conductor if approved by local inspection authority. Refer to **ASM Figure 700-13** if the local inspection authority may not allow for the temporary UG service conductor installed above ground.
2. Customer's service equipment may be mounted below meter socket, but center of meter socket must be mounted at 54 ft. min. to 66 ft. max. above grade. See NEC. for G.F.C.I. Protection.
3. Customer must provide and install 3-wire service conductor and the following. Contact Butler Supply or other supplies for material items.
    1) To connect to secondary pedestal (a minimum clearance of 2 ft. must be maintained from the secondary pedestal to any obstruction).
    2) To connect to padmount transformer (a minimum clearance of 30 in. from side / rear and 10 ft. from front clearance must be maintained from the padmount transformer to any obstruction).
4. The unsecured LFNC liquid tight non-metallic conduit shall not exceed 6 ft. max or 3 ft. min (from the meter to the padmount transformer or secondary pedestal) as per **NEC Article 356.12**. Customer must leave at least 3 ft. of service conductor extending from the open end of the LFNC and a LFNC quick-seal fitting at the end with for Ameren to make connection of the service to the pedestal or transformer.
5. Ameren to install:
    1) For secondary pedestal - Ameren installs customer provided UG service conductor / bushing into 1-1/4 in. opening on secondary pedestal. Customer UG service conductor to be in 1-1/4 in. LFNC with bushing connector.
    2) For padmount transformer - Ameren installs customer provided UG service conductor / bushing into 1-1/4 in. LFNC with bushing connector provided by Customer.
6. Meter, secondary pedestal, and padmount transformer are provided by Ameren. All other material to be furnished and installed by customer.
7. Refer to **BuildWithAmeren.com** for meter socket requirement.
8. Final connection to be completed by Ameren.

METER / MAIN PEDESTAL INSTALLATION - SINGLE METER
Figure 700-15

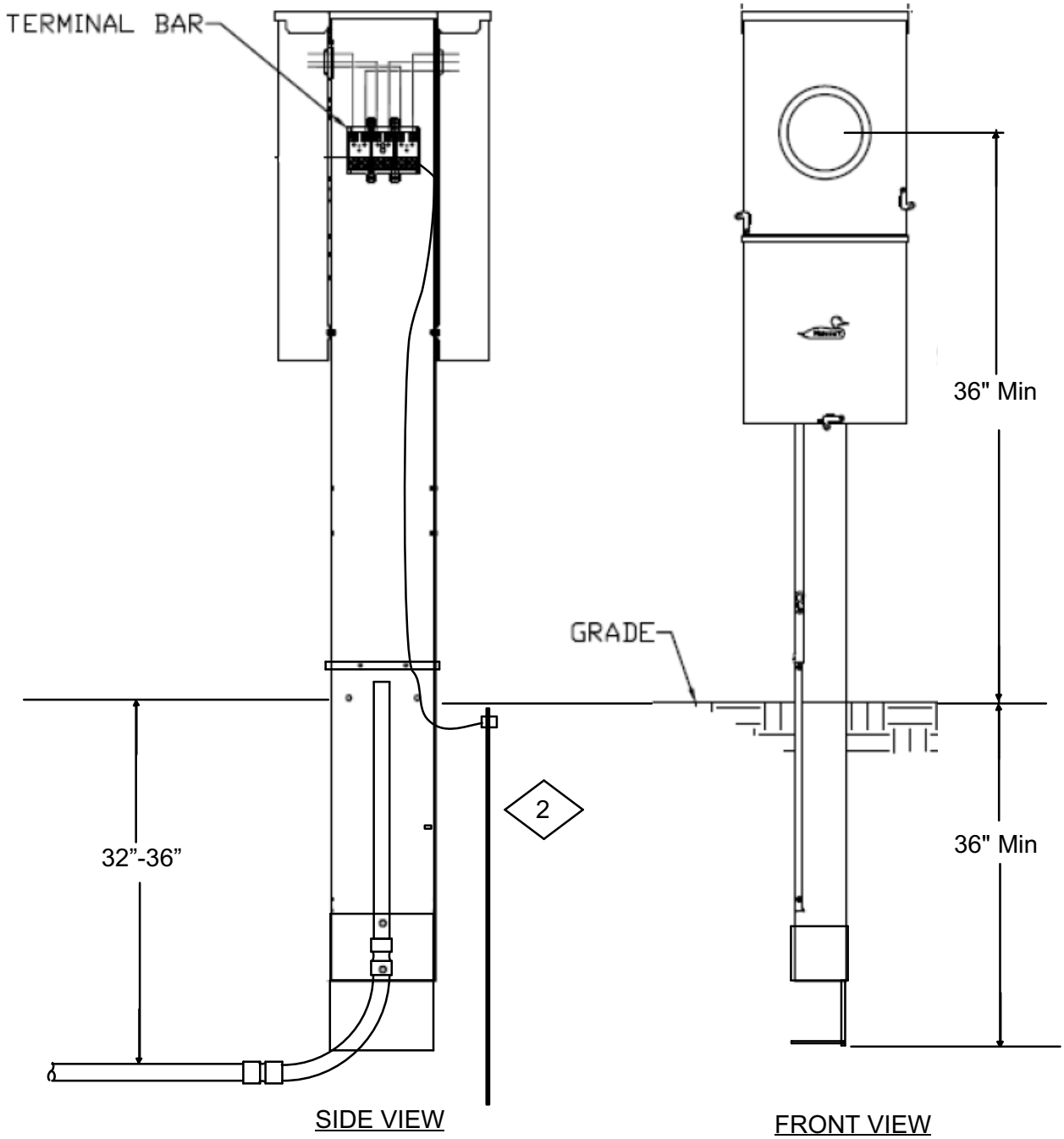


METER / MAIN PEDESTAL INSTALLATION – SINGLE METER
Figure 700-15

CONSTRUCTION NOTE(s): (FIGURE 700-15)

1. Backfill with tamped crushed rock including entire conduit elbow. Foam backfill is not allowed.
2. 32 in. to 36 in. pedestal embedment required. Post extension / base stabilizer foot must be installed as shown on undisturbed earth or crushed rock backfill.
3. Customer shall be responsible to make sure that pedestal is firmly embedded in ground, and plumb to within 1 in. in 12 in. vertical.
4. Conduit shown shall be installed with a minimum of 30 in. of cover to allow for the 24 in. radius bend into pedestal channel. Direct buried conductor can be installed with 24 in. of cover.
5. No obstructions shall block the removable service conductor supply side access cover door.
6. All material shall be furnished and installed by customer.
7. Pedestals shall be labeled for service equipment by UL or Intertek Testing Service (ETL) and approved by Ameren.
8. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
9. Meter pedestal must include main service disconnect.
10. Do not block removable access lid for supply conductors in located on rear of pedestal.
11. After conduit installed, install lower cover on pedestal and backfill.
12. Minimum 2-1/2 in. electrical grade PVC to Ameren designated point when continuous conduit system installed.

METER / MAIN PEDESTAL INSTALLATION - DOUBLE METERS
Figure 700-16



METER / MAIN PEDESTAL INSTALLATION - DOUBLE METERS
Figure 700-16

CONSTRUCTION NOTE(s): (FIGURE 700-16)

1. Backfill with tamped, crushed rock including entire conduit elbow. Foam backfill is not allowed.
2. 32 in. to 36 in. pedestal embedment required. Post extension/base stabilizer foot must be installed as shown.
3. Customer shall be responsible to make sure that pedestal is firmly embedded in ground, and plumb to within 1 in. in 12 in. vertical.
4. Conduit shown shall be installed with a minimum of 30 in. of cover to allow for the 24 in. radius bend into pedestal channel. Direct buried conductor can be installed with 24 in. of cover.
5. No obstructions shall block the removable service conductor supply side access cover door.
6. All material shall be furnished and installed by customer
7. Pedestals shall be labeled for service equipment by UL or Intertek Testing Service (ETL) and approved by Ameren.
8. Approved bonding / grounding as required by local inspection authority or latest version of NEC. Refer to **ASM Section 500**.
9. Meter pedestal must include main service disconnect.
10. Permanently marked “Premises Labels” required. Refer to **ASM Section 200.01, Note 7**.
11. Customer conduit exiting the disconnect MUST NOT block access to the utility supply termination lid cover.
12. After conduit installed, install lower cover on pedestal and backfill.
13. Minimum 2-1/2 in. electrical grade PVC to Ameren designated point when continuous conduit system installed.

(REFER to **DCS 09 00 03 01**)

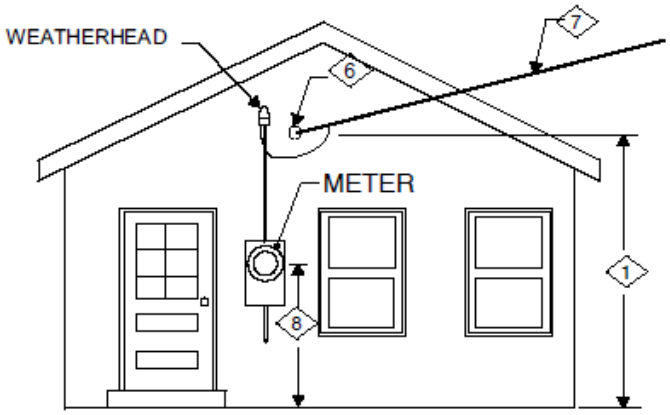


Figure 800-1
TYPICAL SERVICE INSTALLATION

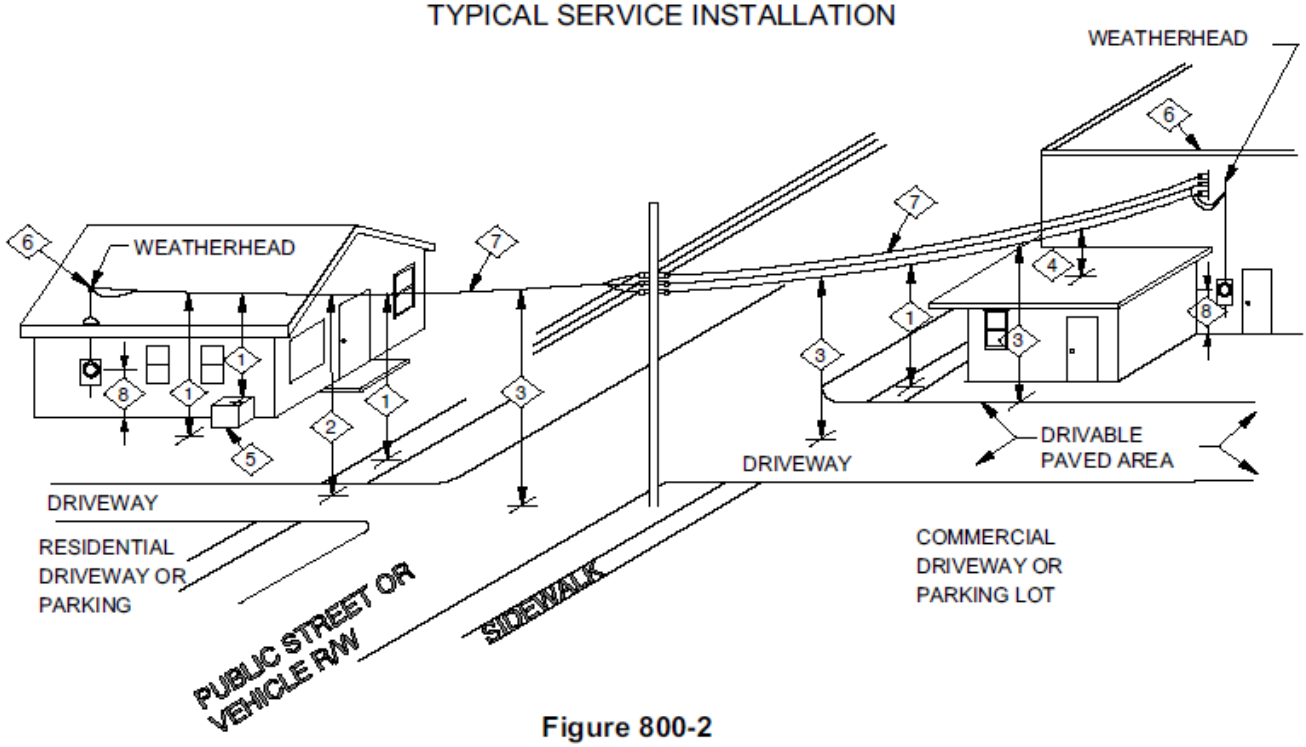


Figure 800-2
TRIPLEX OR OPEN WIRE

DESIGN NOTE(s): (FIGURE 800-1 & FIGURE 800-2)

Over Ground (per **2017 NESC 232**)

1. 12 ft. (triplex) or 12.5 ft. (open wire) over spaces and ways subject to pedestrian or restricted traffic only (no vehicles over 8 ft. high).

   EXCEPTION: Where height of a residential building does not allow these clearances, clearance may be reduced to 10 ft. at the drip loop or service drop for triplex cable limited to 150 volts to ground or 10.5 ft. for open wire limited to 300 volts to ground.

2. 16 ft. (triplex) or 16.5 ft. (open wire) over residential driveways and parking area.

   EXCEPTION: Where height of a residential building does not allow these clearances, clearance may be reduced to 12 ft. for triplex service limited to 150 volts to ground or 12.5 ft. for open wire limited to 300 volts to ground.

3. 16 ft. (triplex) or 16.5 ft. (open wire) over roads, streets, alleys, non-residential driveways, parking lots and other areas subject to truck traffic.

   EXCEPTION: Services over state and federal commercial highways shall be no less than 18 ft. Services over Illinois limited access highways shall be no less than 20 ft.

Over Roofs (includes Parking Garages) (per **2017 NESC 234C**)

4. Clearances from highest point in roof shall be not less than:
   1. 3.5 ft. (triplex) or 10.5 ft. (open wire) over roofs not accessible to pedestrians (see note 9).
   2. 11 ft. (triplex) or 11.5 ft. (open wire) over roofs accessible to pedestrians.
   3. 11 ft. (triplex) or 11.5 ft. (open wire) over roofs accessible to vehicles but not truck traffic.
   4. 16 ft. (triplex) or 16.5 ft. (open wire) over roofs accessible to truck traffic.

   Exceptions:

   a. For services attached to a building (including drip loops) and where voltage between conductors does not exceed 300 volts on a non-accessible roof, a reduction in clearance over the roof is permitted as follows:

      I. 3 ft.

      II. 18 in. within 6 ft. of and terminated at a through the roof raceway or approved support located not more than 4 ft. from the edge of roof.

5. Any equipment housing including air conditioning, platform, or projection which a person might stand on.
6. House knob, bracket attachment, service mast attachment, or upright of adequate size and height to support services required.
7. Normally triplex service conductors but may also be separate service conductors as shown for commercial services.
8. Center of the meter glass shall be at a height of 54 in. to 66 in. above grade.

   Exceptions:

   1. When a meter base is over walkways less than 36 in. wide or in an area where flooding occurs, the center of the meter glass can be 78 in. above walking surface.

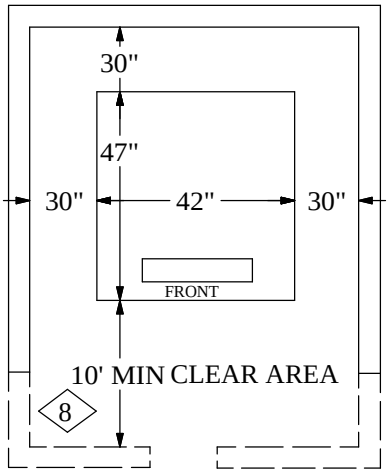
2. For Missouri Only, underground fed residential service installations on the side of a single-family dwelling unit are allowed to be at 36 in. min to the center of the meter glass.
3. When a service installation consists of a meter pedestal, the center of the meter glass must be 36 in. or greater.

9. A roof is considered accessible to pedestrians if there is a means of access through a doorway, ramp, stairway, or permanently mounted ladder.
10. Clearances of Services over Swimming Areas or Hut Tub:

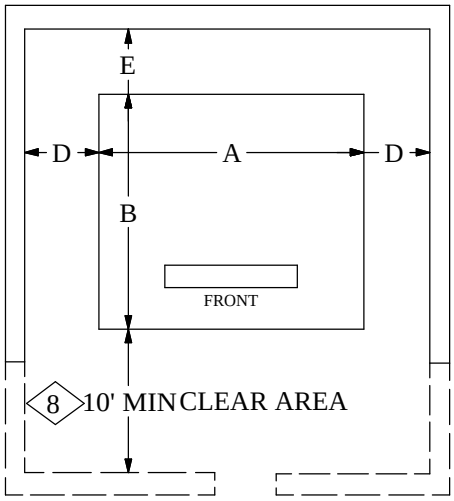
    Although it is possible to have overhead services cross a swimming pool or hot tub, this practice is highly discouraged. It is necessary that the maximum conductor sag under various operating and environmental conditions be determined. Contact your local Ameren representative for assistance.

REQUIRED CLEARANCES FOR PADMOUNT TRANSFORMERS AND SWITCHGEAR (REFER TO DCS 59 81 51 11)

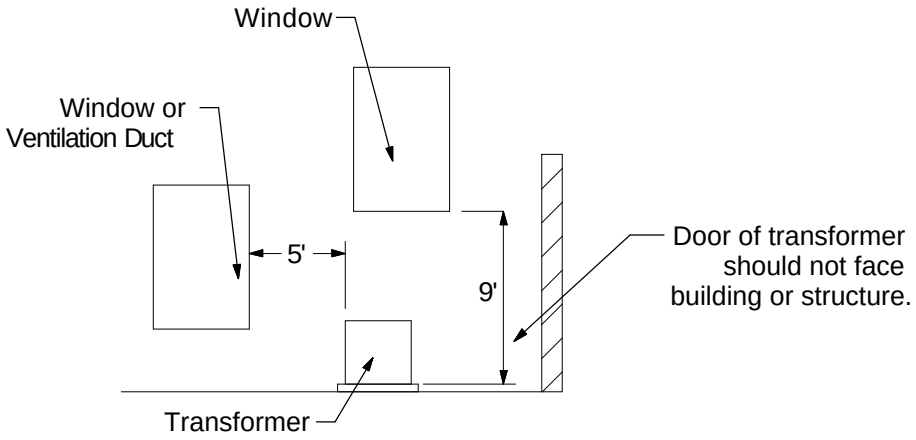
Figure 800-3



Single Phase Installations
25-167kVA Transformers



Three Phase Installations



Typical Minimum Clearance -
Door and Window of Padmount Transformer
(Refer to DCS 34 21 05)

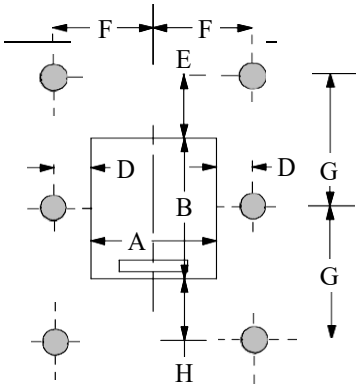
REQUIRED CLEARANCES FOR PADMOUNT TRANSFORMERS AND SWITCHGEAR (REFER TO DCS 59 81 51 11)
Figure 800-3

Clearances				
3 Ø INSTALLATIONS	**A**	**B**	**C**	**D**
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"	49"	120"
Switchgear (Dead Front)	76"	74"	49"	120"
DA Switchgear (Dead Front)	76"	74"	60"	120"

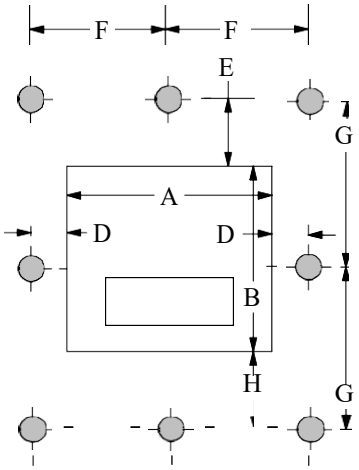
DESIGN NOTE(s): (FIGURE 800-3)

1. The critical dimensions for all padmount 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.
2. If pad mount is enclosed on all 4 sides, 10 ft. minimum clearance from the front of transformer to inside of wall must be maintained for hot stick operations.
3. 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.
4. Customer to provide drainage away from enclosed areas to prevent oil and / or water from standing.
5. 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.
6. Location must be accessible for installing or replacing transformer with crane.
7. Developer to provide plastic conduit of size specified by Ameren to a point designated by Ameren outside the wall 36 in. to 42 in. below final grade.
8. The 10 ft. distance between the front of the pad and the wall may be reduced to 48 in. 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 ft. for single phase and 9-1/2 ft. for three phase installations. A 10 ft. clear area in front of the pad must still be available with the opening or when the gate is open for hot stick operations.
9. To provide for transformer replacement, enclosed area is to be free of overhangs or overhead obstructions. Wall height not to exceed 8 ft. unless the above-mentioned gate or opening is provided, or an easily removable wall is used.
10. Should upgrading be required, the dimensions as shown provide adequate ventilation and space for 1 size larger transformer.
11. Walls shown in drawing, but clearances are required for any obstruction, i.e., switchgear, dumpsters, etc.

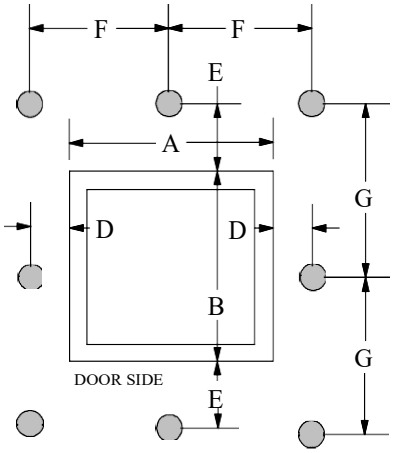
PROTECTIVE BARRIER INSTALLATION
(REFER TO DCS 59 81 51 10)
Figure 800-4



Single Phase Transformer



Three Phase Transformer



Switchgear

Protective Barrier Installed

Equipment Type	Description of Equipment	Composite Pad Stock No.	A (in)	B (in)	C (in) (3)	D (in)	E (in)	F (in)	G (in)	H (in)
1P Transformer	0-167 kVA, Light Weight Pad	12 06 184	42	47	4	12	15	33	40	18
1P Transformer	0-167 kVA, Light Weight Pad	12 06 198	42	47	4	12	15	33	40	18
3P Transformer	75-750 kVA Radial Feed, SM 3 PH Pad	12 06 123	72	65	4	32	27	68	64	36
3P Transformer	1000-2500 kVA Radial Feed, LG 3 PH Pad	12 06 124	84	72	5	32	38	74	73	36
3P Transformer	75-1000 kVA Loop Feed, LG 3 PH Pad	12 06 124	84	72	5	32	38	74	73	36
Switchgear	Manual, Live Front Pad	12 06 109	69	63	36	24	36	58-1/2	67-1/2	-
Switchgear	Manual, Dead Front Pad	12 06 165	76	74	36	24	36	62	73	-
Switchgear	Automated, Dead Front Pad (4)	12 06 165	76	74	36	49	36	62	73	-

PROTECTIVE BARRIER INSTALLATION
(REFER TO DCS 59 81 51 10)
Figure 800-4

CONSTRUCTION NOTE(s) (FIGURE 800-4):

1. Customer installed barriers are to use the following material 4” steel pipe, Premix concrete, and Yellow lacquer paint.

Stk. No.	Description
Non-stock	Pipe - Steel, 4"
11 04 105	Concrete - Premix (Sk)
30 57 025	Lacquer - Yellow (Gal)

   CAUTION: Installation of barrier rails must be coordinated with electric conduit installation to avoid mutual interference.

2. Construct the pipe barriers as follows:
   A. Use 8-1/2 ft. sticks of steel pipe.
   B. Drill holes with an 8 in. auger.
   C. Bury 56 in. of pipe leaving 46 in. of pipe exposed above grade.
   D. Fill the hole around the pipe with concrete to the top of grade.
   E. Fill the pipe with concrete.
   F. Paint the pipe with yellow lacquer.
   G. Round over concrete creating a dome on the top of each post.

DESIGN NOTE(S): (FIGURE 800-4)

3. Dimension (C) is the height or thickness of the pad.
4. Automated switchgear require larger side clearances (D) to open the doors on the control boxes and motor operators.

OH SERVICE DROP ATTACHMENT CLEARANCES - BILLBOARD / SIGN
Figure 800 - 5A

OH SERVICE DROP ATTACHMENT CLEARANCES - BILLBOARD / SIGN
Figure 800 - 5B

CONSTRUCTION NOTES (FIGURES 800-5A & 5B):

1. Preferred method to provide electric service to a business sign or billboard is via UG service installation.
2. Where a Billboard / Sign is constructed like **ASM Figure 800-5B** that requires display maintenance, such as for tenant changes or lighting repairs, and a 3-ft. spherical clearance radius cannot be maintained from the display(s) to an overhead service drop / drip loops / connections, then an overhead service installation will not be permitted to attach to the sign's structure. Existing signs with overhead service attachments will be grandfathered but the sign company must call the proper Ameren contact center in advance to request the installation of temporary covers or temporary disconnect at the source by Ameren personnel when sign maintenance / repairs are performed.
3. When a Billboard / Sign is served with an overhead installation, the following clearances shall apply:
   a) Service drop shall not cross within 10 ft. of the face of a display causing an obstruction to do routine sign maintenance work using a ladder or lift.
   b) Service drop attachment, weatherhead, and drip loops must maintain a minimum of 3 ft. below the upper overhang sign / billboard structure / catwalk / lights and maintain a minimum distance of 3 ft. from permanently installed ladders. Where 3 ft. from permanently installed ladders cannot be maintained, a permanent metal screen barrier of sufficient attachment strength (e.g., perforated catwalk with angle framing on all sides) can be installed to prevent readily accessible contact with energized parts.
   c) Service drop must maintain greater than 10 ft. horizontal clearance when passing a permanent climbing ladder.
   d) When a permanent upper ladder is installed to climb between the billboard faces, this upper ladder must maintain a minimum distance of 3 ft. above the service drop, weatherhead, and drip loops. A means must be permanently installed such as a small horizontal catwalk so that temporary ladder or lift used to access the upper ladder do not require leaning over or setting up in a manner than would allow the ladder or lift to be within 3 ft of the service attachment, weatherhead, or drip loops.

900.01 GENERAL

Electric service must be used in a way that does not interfere with Ameren's service to other customers or damage the Company's service lines or equipment. Should such interference occur, the Company will consult with the customer to determine what corrective measures should be taken to eliminate the problem. It may become necessary for the customer to make wiring changes or install approved controlling devices at their expense.

Where practical, the Company upon request, will furnish in accordance with the provisions for furnishing “Excess Facilities”, at Customer expense, a separate transformer, or other facilities to reduce or eliminate such interference. The Company, however, does not by installing such facilities waive its right, where detrimental conditions from such equipment still exist, to require the customer to install additional corrective equipment on the customer side of the electric service. Unless corrected, the Company will discontinue all service to the Customer.

900.02 CUSTOMER APPARATUS

Neither by review nor the rendering of emergency repairs or advisory service does the Company give any warranty, expressed or implied, as to the adequacy, safety or other characteristics of any equipment, wires, appliances, or device owned or maintained by Customer.

900.03 FLUCTUATING LOADS

It is the customer's responsibility to notify the Company before installing any equipment that may cause voltage or frequency fluctuations on the company's Distribution System. Welders, x-ray equipment, motors connected to variable load machinery, and other equipment having fluctuating load characteristics may require special facilities for satisfactory service. The customer shall, prior to completion of design or purchase of such equipment, furnish the Company complete information as to the manufacturer, type, size, voltage, amperage, power factor, harmonic content and other data regarding the equipment's performance under conditions of maximum output, and shall also supply such other information pertaining to the equipment as the Company will require to enable it to determine if adequate service for the equipment is available at the desired location.

In cases of high motor starting current, customer loads resulting in harmonic distortions or significant loads with wide and / or frequent fluctuations, etc., customer shall install on customer side of Company meter, all corrective equipment necessary to enable Company to maintain the integrity of its electric distribution system. For Customers not voluntarily complying with this requirement, Company, where practical, may install corrective equipment on its side of the meter and charge Customer a lump sum amount for the current cost of such equipment and the cost of any subsequent additions to or replacement of such equipment, whenever said future installations occur.

Failure of Customer to install such corrective equipment or to pay for that installed by Company currently, or in the future, shall be grounds for the disconnection of electric service.

900.04 LOAD BALANCE

Customers should balance the load between the ungrounded conductors on single phase services as closely as possible. An unbalanced load may cause overheating of one conductor or flickering lights on the more heavily loaded circuit when appliance motors start.

Customers receiving three phase service are required to maintain a balanced load between the ungrounded service conductors. Load imbalances may cause the customer's equipment to operate in an unsatisfactory manner, blow fuses or cause other protective devices to interrupt electric supply on the unbalanced circuit Three phase load imbalance may also cause a disturbance to the Company's supply of electric service to nearby customers.

When an imbalance occurs, the Company may assist customers to determine the cause of the problem and may recommend corrective measures.

900.05 POWER FACTOR

Acceptable power factor is defined by the appropriate Company tariffs. The Company's Customer Service Representative will provide Customers with appropriate information upon request.

Customers may install the corrective equipment necessary to meet this requirement on customer's side of Company meter. Such equipment shall be controlled and maintained by Customer to avoid a leading power factor at any time, and to avoid high voltage conditions during periods of light load. To monitor this power factor requirement, the Company will install appropriate metering equipment for the monthly billing of a KVAR reactive charge as applicable.

For all customers receiving service under other rate schedules, not voluntarily complying with this power factor requirement, the Company may, where practical, install corrective equipment on its side of the meter and charge customer a lump sum amount for the current cost of such equipment and the cost of any subsequent additions to or replacement of such equipment whenever said future installations occur. Failure of Customer to install such corrective equipment or to pay for that installed by the Company currently, or in the future, may be grounds for the disconnection of electric service.

900.06 CAPACITORS

Use of capacitors may become necessary for a customer to achieve acceptable power factor correction. In every case where the customer elects to install capacitors, the Company must be consulted prior to purchase or installation. Improper size, type, installation, or operation of capacitors can have a serious adverse effect on the Company's service to other customers. It may also pose a danger to personnel working on the Company's distribution lines. When a customer installs capacitors on their electrical facilities to improve the power factor of their installation, the customer shall provide, at the request of the Company, to avoid abnormal voltages or damage to the Company's facilities, a means of automatically disconnecting any or all the capacitors when the equipment causing the low power factor is not operating.

900.07 PROTECTIVE EQUIPMENT

Customers are advised to install protective equipment in accordance with the latest edition of the National Electrical Code or other pertinent sources of information for all types of equipment such as, but not limited to, motors, computers, or any other type of voltage sensitive electronic equipment. Adequate protection should be provided for the following conditions:

A. Overload.
B. Loss of voltage.
C. High or low voltage.
D. Loss of phase (single phase condition on three phase motors and transformers).
E. Re-establishment of normal service after any of the above.
F. Phase reversal.
G. Motors that cannot be subject to full torque on start-up.
H. Harmonics or waves form irregularities.
I. Transient voltage spikes because of lightning, capacitor switching, and routine circuit switching.

Sensitive equipment such as Variable Frequency Drives at a customer's facility may require additional protection in the form of a choke (reactor) for both the AC supply and DC output to prevent the VFD from nuisance tripping or failure from a high voltage transient event.

The lack of adequate protection may result in damage to customer equipment and the associated expense of delay and repair. The Company will not be responsible for loss or damage to customer-owned equipment where such loss or damage is caused by the absence of protective devices, inadequate protective devices, or failure due to not following manufacturer and utility recommendations.

900.08 VOLTAGE OPTIMIZATION - AMEREN ILLINOIS

Voltage Optimization (VO) is the use of automation on distribution voltage control devices to lower system delivery voltage to reduce end-use customer energy consumption and utility distribution losses. The VO program is a combination of Conservation Voltage Reduction (CVR) and Volt-VAR Optimization (VVO). Ameren Illinois is required to operate within voltage limits at the point of delivery as specified in **Section 410.300** of the **Illinois Admin Code**. This program will reduce delivered voltage towards the lower end of the acceptable voltage range. Customers are responsible for adjusting and maintaining their equipment to operate within regulatory limits. Ameren Illinois will not be liable for adjustments or damage to customer equipment.

900.09 MOTORS AND APPARATUS

Customer is invited to consult Company before purchase, installation, or wiring of motors or other apparatuses to determine the kind of service that will be supplied and way in which such equipment should be connected and operated.

All motors, apparatuses and appliances shall have such characteristics which enable the Company to maintain a satisfactory standard of service to Customer being served and all other customers served by the same Company distribution system.

The Company reserves the right to define the type of standard service to be supplied and should be consulted before equipment is purchased or ordered. The electrical characteristics of motors greater than 7-1/2 H.P. or where the aggregate load of smaller motors is more than 20 H.P. requires consideration and evaluation by Ameren.

Many times, motors greater than 7-1/2 H.P. require reduced voltage soft starters or variable frequency drives to prevent voltage sags on the distribution system that can range from imperceptible local deviations to major system fluctuations affecting large areas. Customer awareness can range from minor annoyance due to occasional light flicker, to major widespread complaints regarding erratic fluctuations of televisions, computers, solid-state controlled equipment, and other voltage sensitive apparatus. The Company has the right and obligation to ensure that no operations of customer owned equipment produce objectionable or detrimental effects on the voltage supplied to other customers.

900.10 PROTECTION AGAINST ABNORMAL CONDITIONS

A. Three-phase Motors

All motors and special apparatuses should be equipped with suitable undervoltage time delay tripping devices to protect against sustained undervoltage or service interruption and to prevent automatic disconnection of equipment upon momentary voltage disturbance.

Three phase motors should be equipped with suitable protective devices to prevent single phase operation, improper direction of rotation, and excessive heating due to overcurrent or voltage unbalance.

B. Three-phase Transformations

Three phase transformers on the load side of Main Disconnecting Means should be equipped with suitable protective devices to prevent the Loss of Phase condition.

Customers must carefully evaluate the operational characteristics of transformers located on the load side of Main Disconnecting Means. Many step up / step down transformer manufacturers use a standard three-legged core design. On a grounded-wye system, the Wye / Wye-grounded construction reduces the likelihood of ferroresonance and provides a ground source. However, under the loss of phase condition (unbalanced voltage) or unbalanced load, this can create zero sequence voltage (zero sequence flux in the core). In the three-legged construction, there is no path for this flux to circulate within the core. Thus, the flux jumps through the tank and air gap. Flux through the transformer tank (enclosure) creates localized eddy current heating so much as to discolor / overheat the unit and possibly leading to failure. It is highly recommended to incorporate one of the following transformer options to help mitigate the conditions:

1. One side of the transformation being Delta connected.
2. A delta tertiary connection associated with the Wye / Wye Configuration.
3. Three individual single-phase transformers connected to form a three-phase bank or triplex construction.
4. A four- or five-legged core.
5. Shell type core construction.
6. A three-legged transformer with primary protective devices that sense loss of voltage magnitude and unbalance. When excessive voltage unbalance is detected, all primary phases need to be disconnected simultaneously.

If this voltage transformation is associated with a DER installation (solar / energy storage / wind) that utilizes inverters, a Wye / Wye configuration with a Delta connected tertiary winding may prevent the inverter from sensing a Loss of Phase event on a three-phase system. The consequence of not detecting the Loss of Phase condition would be a violation of Standard IEEE 1547. Compliance with IEEE 1547 is required by Ameren Illinois and Ameren Missouri for all customer with DER interconnections.

Company will not be responsible in any way for damage to Customer equipment due to failure of Customer to provide adequate protection.

Customers may need to install power quality equipment to between the main service disconnect and their equipment to mitigate any equipment damage and to maintain electric supply to critical loads. The power quality equipment may be generators, uninterruptible power supplies (UPS), surge suppressors or other devices. These devices will not be purchased or provided by Ameren.

1000.01 CUSTOMER FURNISHED SELF-CONTAINED METER SOCKET REQUIREMENTS

Customer shall furnish, install, and maintain a meter socket(s) which meets Ameren requirements stated herein. This applies to self-contained electric watt-hour meter socket(s) for both individual and multi-meter installations. The watt-hour meters will be furnished, installed, and maintained by Ameren.

Ameren will maintain a list of approved manufacturer's metering equipment catalog numbers. Ameren will assist the manufacturer in meeting these requirements by reviewing and commenting on designs and / or manufactured samples of metering equipment. Only metering equipment include in this list will be acceptable without prior approval from Ameren.

To obtain the latest catalog numbers for the Ameren Approved Metering Equipment List, please visit the website at **BuildWithAmeren.com**.

Failure by Customer / Contractor to comply with the requirements stated herein may lead to a delay in Ameren providing the requested service until metering equipment requirements are met. Other **ASM sections** pertain to mounting location, mounting heights, and other service requirements and give specific installation instructions. Depending upon your location, you may also need to obtain approval from your local AHJ.

1000.02 METER MOUNTING EQUIPMENT REQUIREMENTS

1. Equipment must be certified by an approved independent testing laboratory using the appropriate standard for the certification. At present Ameren recognizes UL and ETL as approved testing laboratories for equipment installed on the Ameren system. Meter sockets shall meet standards contained in the latest revision of UL414, ANSI C12, and ANSI C12.7.
2. Metering equipment shall be labeled as maximum ampacity, maximum voltage, manufacturer's name, and manufacturer's catalog number. All meter sockets and applicable bypasses shall be rated to carry 100% of ampacity continuously.
3. The meter socket shall be of a powder coated finish over galvanized steel or aluminum construction, and rated NEMA type 3R or better. Fabrication with fiberglass or non-metallic material is prohibited.
4. All meter sockets shall be ringless.
5. All covers shall be equipped with no more than one securely fastened hasp for padlocking by Ameren. Covers that secure more than one meter, or trough shall be individually sealable.
6. Meter sockets must have a single lug to accommodate #8 through #2 grounding electrode conductor sized per NEC. The lug shall be rated for both aluminum and copper conductors. and bonding jumper sized per NEC.
7. The lugs for 200 amperes and 320 amperes continuous / 400 amperes max rated sockets will be sized to accommodate conductors as outlined below:
   A. Meter sockets for up and equal to 200 amperes service shall be equipped with lay-in lugs. The lugs shall be suitable for a range of conductors from No.6 to 350 kcmil. No more than one conductor shall be installed per lay-in lug.

B. Meter sockets 320 amperes continuous / 400 amperes max rated shall be equipped with mechanical pressure, stud type connectors that are tinned and suitable for either aluminum or copper conductors.

8. Multi-position (trough / gang) types of self-contained metering equipment with direct upward termination of underground supply conductors (without a conductor loop to terminate supply side conductors) are acceptable provided they allow for conductors to be trained in a manner that would prevent ground settling and frost heaving from placing tension on supply conductors that would transfer to the terminal box supply termination lugs.

9. Center-tap, grounded delta, 3-phase 4-wire meter sockets require the high leg / wild leg to be placed in the right position at the meter socket and this conductor will be marked orange in color. The high leg (also referred to as the wild leg) will terminate in the middle position on the customer main service disconnect, except in panel boards, switchgear arrangement ahead of and beyond metering equipment compartments.

10. For 3-phase, 3-wire corner grounded and floating (ungrounded) delta services, the unmetered phase will be in the center position of the self-contained meter socket. For any exception to this requirement, the field metering supervisor and the field supervising engineer must be consulted.

11. Neutral conductor shall be marked with white or gray at all termination points such as at the weatherhead, meter socket and main service disconnect or with other designation from manufacture of conductor.

12. The 5th jaw on clamp jaw lever bypass sockets shall be located as shown in **ASM Figure 1000-1** to **ASM Figure 1000-10**.

13. The meter socket must be bonded / grounded per NEC requirements. Refer to **ASM Section 500**.

14. Clamp-jaw lever type bypass meter sockets shall be provided with a clear polycarbonate safety shield over the socket interior.

15. All metering equipment shall be surface mounted.

16. Ameren, by testing or approving equipment, gives no warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any equipment, wiring or device and assumes no responsibility with respect thereto.

17. All unused openings in the socket shall be closed with plugs and securely tightened from the inside.

18. Specific downtown this areas of Bloomington, Champaign, Decatur, Galesburg, Normal, Ottawa, Peoria, and St. Louis are designated as heavy underground, grid networks, and / or spot networks. Service restrictions are specific to their corresponding area and Customer should consult Company to determine the voltage and method of supply that will be available prior to beginning customer engineering or purchasing of equipment. Refer to **ASM Section 1350** for more details in Illinois.

19. For Ameren Missouri, the Downtown St. Louis Underground District is the area bounded by Twenty-Second Street, Cole Street, Spruce Street, and the Mississippi River, and is designated as heavy underground, grid networks, and / or spot networks. Service restrictions are specific to their corresponding area and Customer should consult Company to determine the voltage and method of supply that will be available prior to beginning customer engineering or purchasing of equipment, refer to **ASM Section 1300**.
20. Minimum dimension requirement for self-contained meter sockets - UG services.

Table 1000-1 UG Service Self-Contained Meter Socket without Load-Side Breaker (NOT METER / MAIN COMBO)

Meter Socket Ampacity (Continuous Rating)	**Max Service Ampacity**	**PH-Wires**	**Voltage**	**Min Dimension (W x H x D)**	**Min Spacing from Center Meter Block to Top of Socket**	**Bypass**
200 AMP	200 AMP MAX	1PH-3W	120/208V (Network), 120/240*, 240/480V	12-3/4" x 19" x 4-7/8"	9"	Lever*
		3PH-3W	240V, 480V			
		3PH-4W	208Y/120V, 240/120V, 480Y/277V			
320 AMP	400 AMP MAX	1PH-3W	120/240V	15" x 31-1/2" x 4-7/8"	17-1/2"	Lever
		3PH-3W	240V			
		3PH-4W	208Y/120V	17-3/4" x 38-3/4" x 6-1/2"	19-1/4"	Lever

*****Lever Bypass not required for TEMPORARY 200 AMP 1PH - 3W 120/240V service. For 201 amp and greater, lever bypass is required. Refer to **ASM Section 1000.03**.

Table 1000-2 UG Service Self-Contained Meter Socket with Load-Side Breaker (METER / MAIN COMBO)

Meter Socket Ampacity (Continuous Rating)	**Max Service Ampacity**	**PH-Wires**	**Voltage**	**Min Dimension (W x H x D)**	**Min Spacing from Center Meter Block to Top of Socket**	**Bypass**
200 AMP	200 AMP MAX	1PH-3W	120/208V (Network), 120/240	14" x 34-1/2" x 4-1/2"	9"	Lever
		3PH-4W	208Y/120V, 240/120V	17-1/4" x 34" x 5-3/4"	10-3/4"	
320 AMP	400 AMP MAX	1PH-3W	120/240V	15" x 42" x 4-7/8" (Vertical)	17-1/2"	Lever
				29" x 35" x 6" (Horizontal)		
		3PH-4W	208Y/120V, 240/120V	15" x 42" x 4-7/8" (Vertical)		
				29" x 35" x 6" (Horizontal)		

1000.03 METER SOCKET BYPASS REQUIREMENTS

1. Clamp-jaw lever bypass self-contained meter sockets are required in the following individual meter socket applications:

   A. Residential single phase (100 - 320 amperes continuous / 400 amperes max)

   B. Non-residential single phase (100 - 320 amperes continuous / 400 amperes max)

   C. All three phase services (100 - 320 amperes continuous / 400 amperes max)

   D. All self-contained single phase and three phase 480 volts services (200 amperes max)

   E. All temporary services greater than 200 amperes

   F. Single meter socket lever bypass handle to be 1 - ¾ in. minimum from side of enclosure. For gang metering, the lever bypass handle to be ¾ in. minimum from side of enclosure.

2. Clamp-jaw lever bypass meter socket is required for all multi-meter sockets for residential and non-residential services with or without a main service disconnect. A slide type bypass is not permitted.

3. For a single-phase 100 or 200 amperes temporary service installation, a clamp-jaw lever bypass or horn bypass is not required in the meter socket. If that meter socket is to be reused for the permanent service, a clamp-jaw lever bypass will be required.
   The clamp-jaw lever bypass meter socket shall be **heavy duty**, lever operated, clamp-jaw with jaw tension release design with plastic protective shield like the Milbank (HD-5 or HD-7) or Siemens / Talon (HQ-5 or HQ-7) bypass mechanisms. The bypass action of all lever type bypass mechanisms shall be visible. This includes the ability to visibly see the opening and closing of the bypass mechanism contacts, as well as the clamping action of the meter socket jaws. Bypass mechanisms not meeting this requirement shall be rejected. Clamp-jaw lever bypass mechanisms not previously used on the Ameren system shall be presented to the Standards Engineering Department for review.

1000.04 MULTI-METER INSTALLATION REQUIREMENTS

1. Multi-meter socket installations shall conform to the same clamp jaw lever bypass criteria in **ASM Section 1000.03** above.

2. Combination multi-meter equipment installations with fused or circuit breaker type main service disconnects not listed in the Ameren Approved Metering Equipment List may be acceptable subject to Company approval of meter sockets, location, electrical one line, conductor landing space, security provisions, etc., before fabrication is started. Metering equipment not found on the Ameren Approved Metering Equipment List must secure approval from Ameren Metering and the Ameren Standards Department before ordering of the equipment to avoid costly delays.

3. Multi-meter equipment requires the line side terminal compartment to have a seal-able and padlockable cover separate from meter socket covers.

4. Up to and including six meters may be supplied at a single point of delivery without a main service disconnect on the line side of individual meter sockets.

1000.05 LOAD CENTERS

Where customer main service disconnects and / or fuses are combined with meter equipment, the cover for the meter and the cover for customer access to the switch / fuse and load side wiring shall be separated such that Company's meter and line side service compartments may be secured and sealed separately from customer side. On such combination units, internal barriers shall be permanently installed to prevent access to meters, equipment, and un-metered wiring via the customer compartments. Labels should be adhered to the outside of lids (covers) on meter / main combos stating, **"Main Service Disconnect"**.

1000.06 METER SOCKET MAINTENANCE

It is the responsibility of Customer / Building Owner to maintain, repair and replace the metering (socket) equipment to keep such equipment in a safe, secure, and usable condition. When such equipment is subject to vandalism or damage, it is the responsibility of the Customer / Building Owner to remedy the situation by protective measures or by changing location.

Ameren may perform emergency repair to maintain or restore service and to protect public safety. If the hazard posed by the equipment is critical to safe operation, immediate disconnection of service may be necessary until corrections are made by the Customer / Building Owner. Ameren will notify Customer / Building Owner and the inspection Authority when an unsafe meter socket and / or service equipment problem is found.

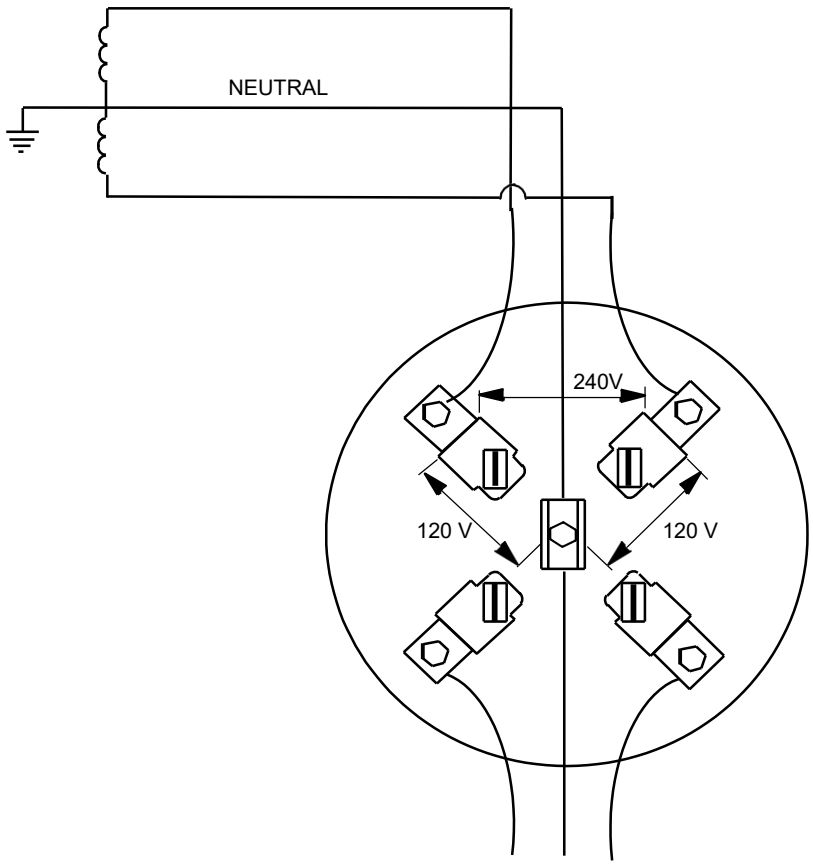
Ameren may allow a reasonable time, normally not to exceed 30 days, for the repair or replacement of meter socket equipment, subject to the hazard involved. Time frame for completion of corrections is based on severity of equipment condition. Equipment posing a grave hazard to the public may warrant immediate disconnection.

Ameren emphasizes the need for the responsible building owner to minimize safety hazards to all concerned by maintaining service installations which include service riser, meter socket, CT / PT enclosure, main service disconnects, and switchboard in a safe and good working order.

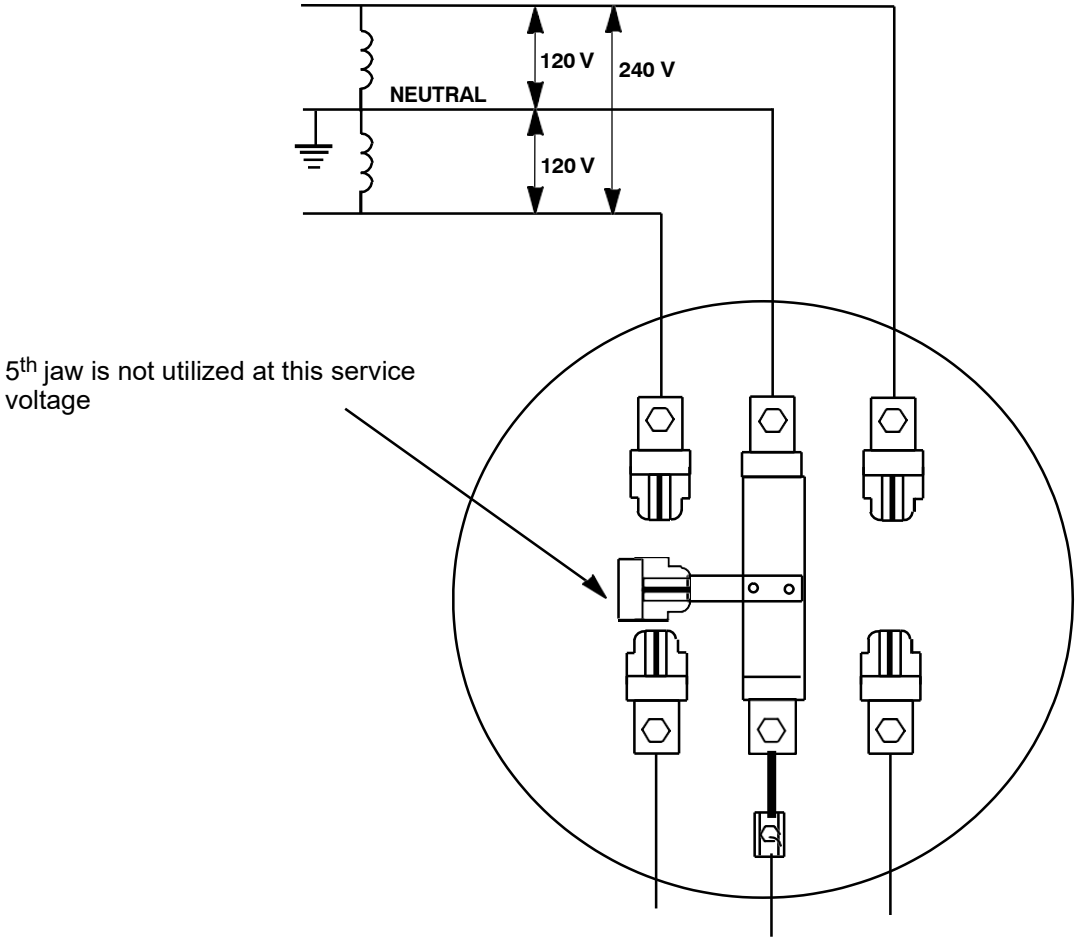
1000.07 DRAWINGS

Figure 1000-1	FOR TEMPORARY SERVICES ONLY: 3-WIRE, 120/240 VOLTS, 1-PH, SELF-CONTAINED
Figure 1000-2	3-WIRE, 120V/240 VOLTS, 1-PH, SELF-CONTAINED (LIMITED TO 320 AMPERES CONTINUOUS / 400AMPERES MAX)
Figure 1000-3	3-WIRE, 240/480 VOLTS, 1-PH, SELF-CONTAINED "NETWORK METERING" (LIMITED TO 200 AMPERES)
Figure 1000-4	3-WIRE, 120/208 VOLTS, GROUNDED NEUTRAL, SELF-CONTAINED (LIMITED TO 200 AMPERES)
Figure 1000-5	4-WIRE, 208Y/120 VOLTS, GROUNDED WYE, 3-PH, SELF-CONTAINED (LIMITED TO 320 AMPERES CONTINUOUS / 400 AMPERES MAX)

FOR TEMPORARY SERVICES ONLY
3-WIRE, 120/240 VOLTS, SINGLE-PHASE SELF-CONTAINED
Figure 1000-1



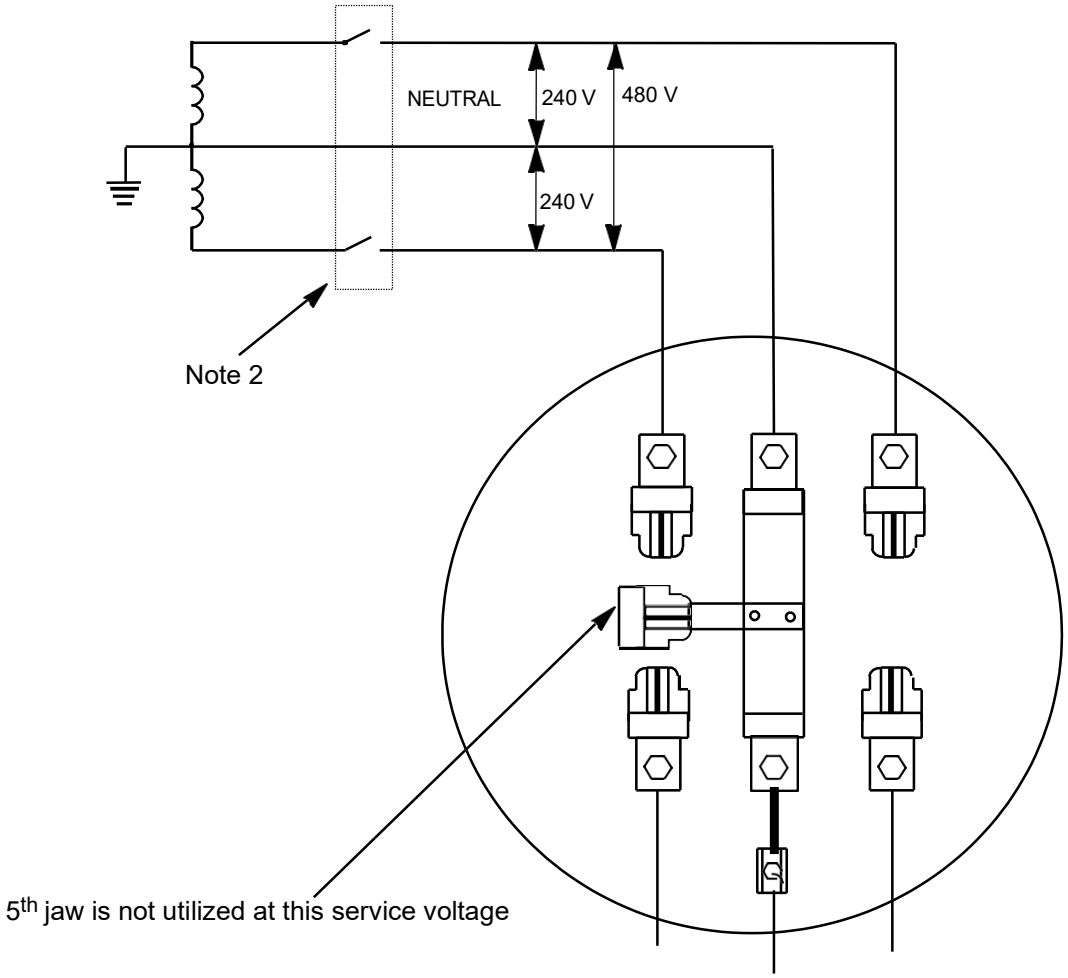
3-WIRE, 120/240 VOLTS, SINGLE-PHASE SELF-CONTAINED (LIMITED TO 320 AMPERES CONTINUOUS / 400 AMPERES MAX)
Figure 1000-2



CONSTRUCTION NOTE(s): (FIGURE 1000-2)

1. 5th jaw may be found in 9 o'clock position, BUT not utilized for this service voltage.

3-WIRE, 240/480 VOLTS, SINGLE-PHASE SELF-CONTAINED (LIMITED TO 200 AMPERES) (NOTE 3)
Figure 1000-3



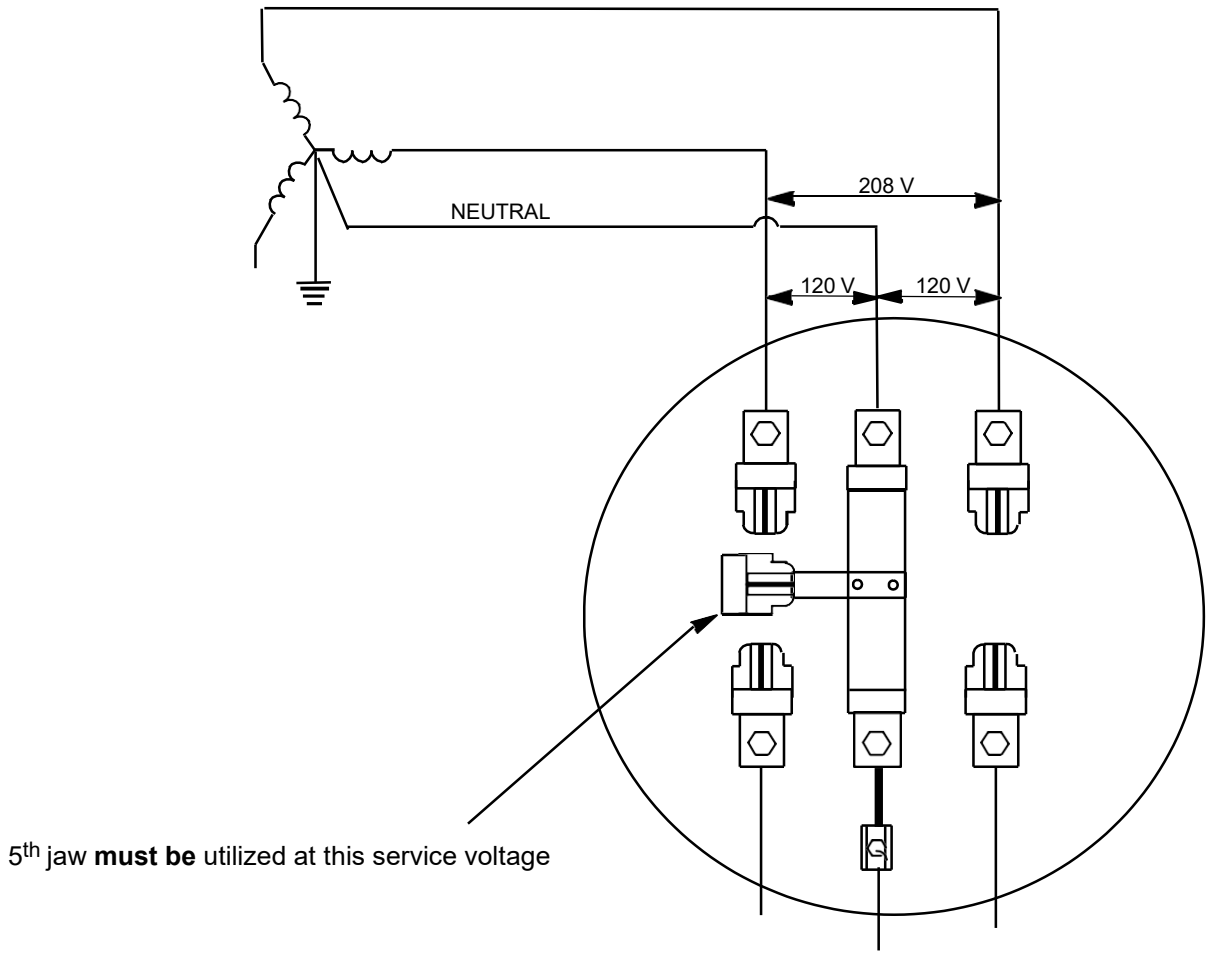
CONSTRUCTION NOTE(s): (FIGURE 1000-3)

1. 5th jaw may be found in 9 o'clock position, BUT not utilized for this service voltage.
2. Knife blade switch without overcurrent protection fulfilling cold sequence meter disconnect requirement on source side of meter socket.
3. Limit to 200 Amperes - for exception see **ASM Section 200**.

3-WIRE, 120/208 VOLTS, SINGLE PHASE, GROUNDED NEUTRAL SELF-CONTAINED "NETWORK METERING"

(LIMITED TO 200 AMPERES)

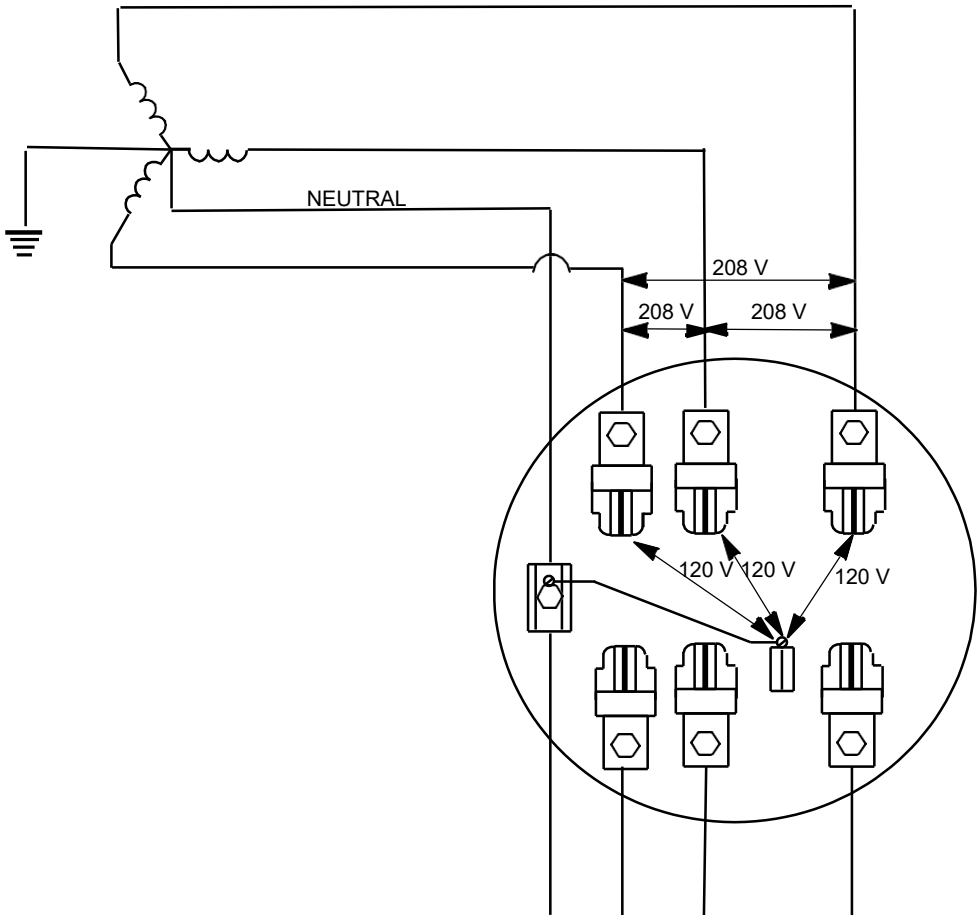
Figure 1000-4



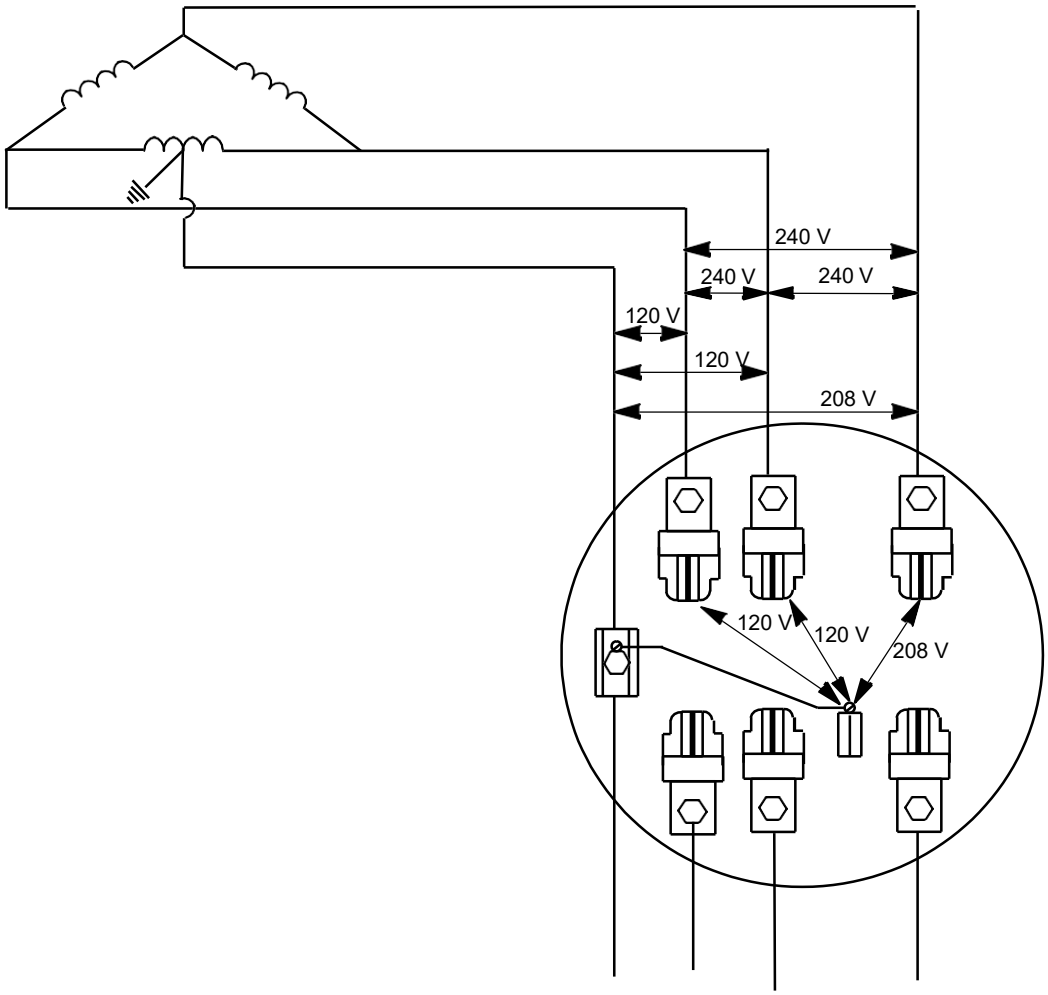
CONTRUCTION NOTE(s): (FIGURE 1000-4)

1. 5th jaw **must be** in 9 o'clock position for all multi-position meter packs / vertical stacks for service amperes / voltage listed above.
2. 5th jaw will be found 9 o'clock position for stand-alone, single meter sockets and single-position meter / main combos for service voltage listed above.

4-WIRE, 208Y/120 VOLTS GROUNDED WYE, THREE-PHASE SELF-CONTAINED (LIMITED TO 320 AMPERES CONTINUOUS / 400 AMPERES MAX)
Figure 1000-5



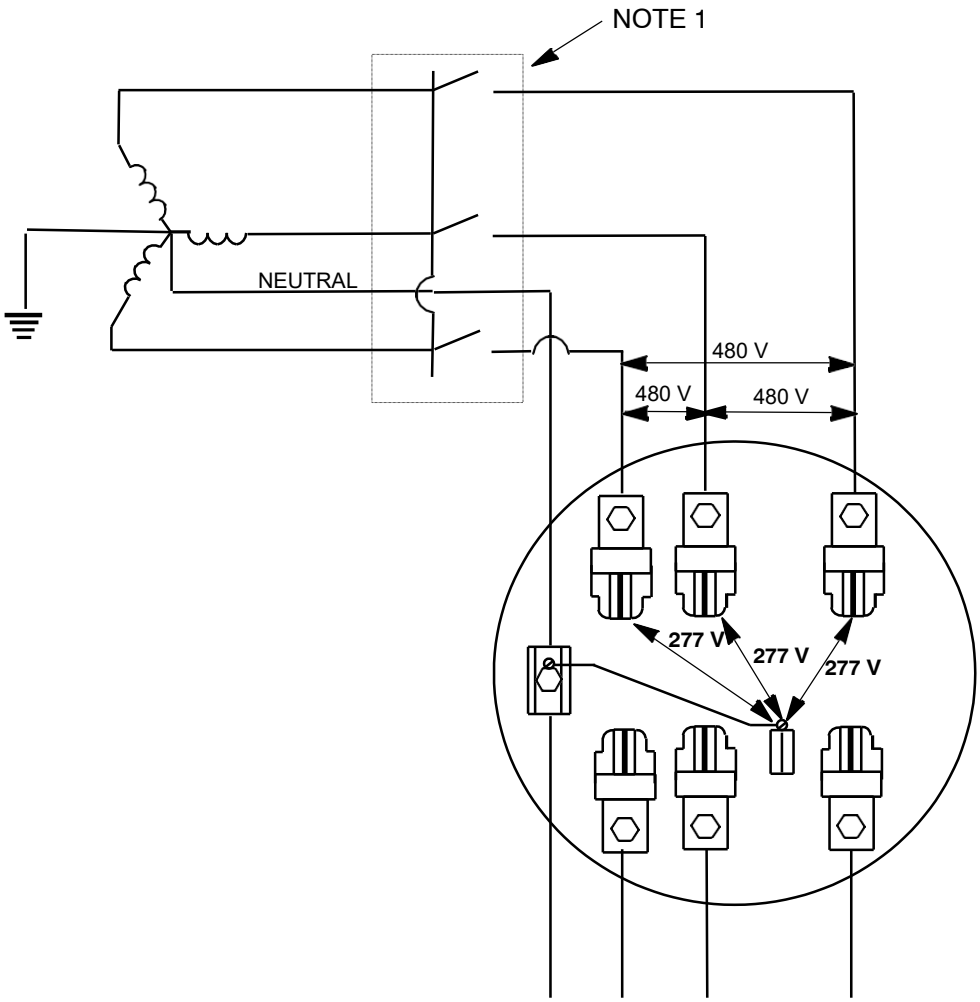
4-WIRE, 240/120 VOLTS, GROUNDED CENTER TAPPED DELTA, THREE-PHASE SELF-CONTAINED (LIMITED TO 320 AMPERES CONTINUOUS / 400 AMPERES MAX) FIGURE 1000-6



CONSTRUCTION NOTE(s): (FIGURE 1000-6)

1. High Leg (Wild Leg) must terminate at the right-hand jaw of the meter socket and be either orange in color or marked with orange tape. The high leg (wild leg) will then terminate on the center lug position of the main service disconnect.
2. Refer to **ASM Section 400** for availability.

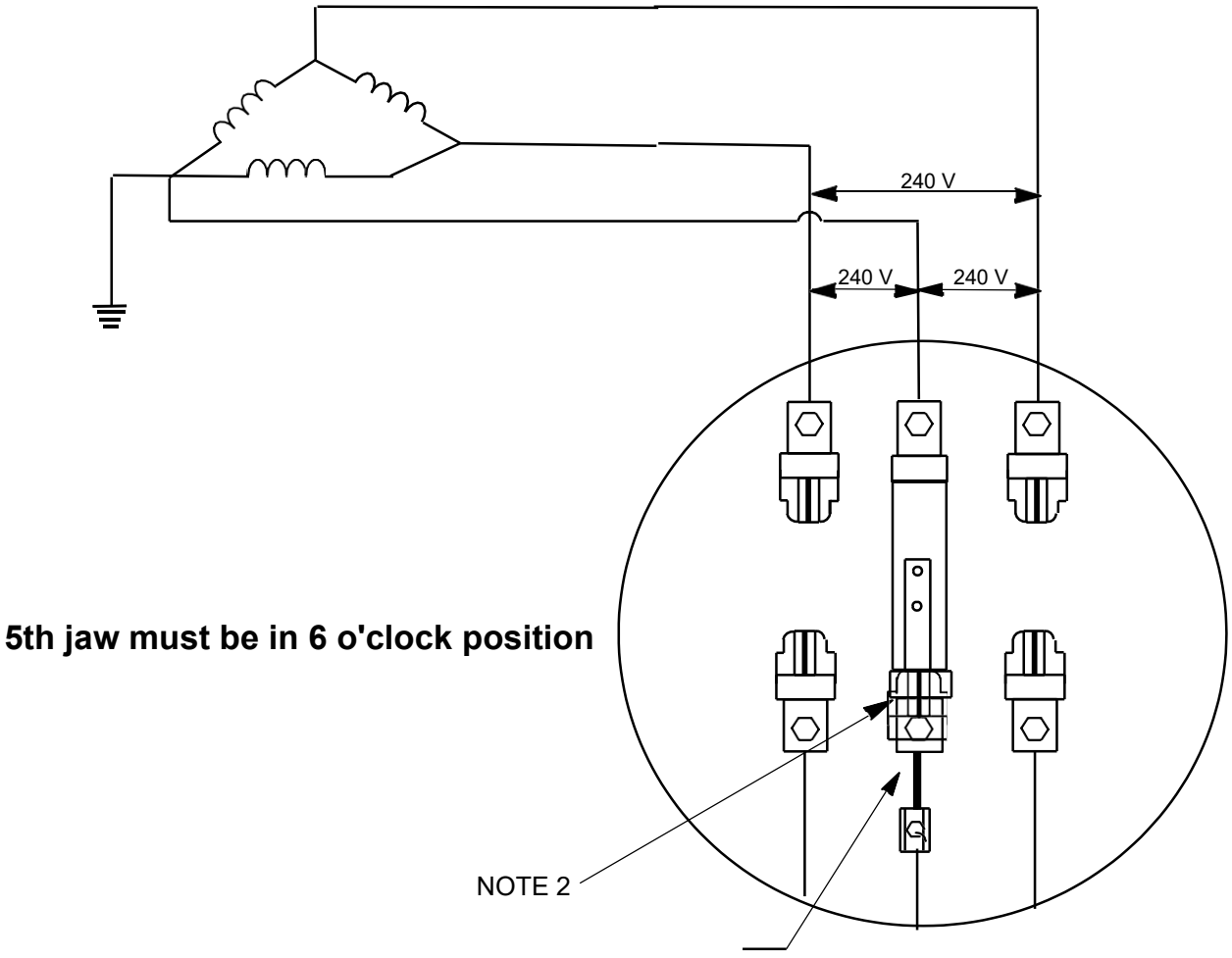
4-WIRE, 480Y/277 VOLTS, GROUNDED WYE, THREE-PHASE SELF-CONTAINED (LIMITED TO 200 AMPERES) (NOTE 2)
Figure 1000-7



CONSTRUCTION NOTE(s): (FIGURE 1000-7)

1. Knife blade switch without overcurrent protection fulfilling cold sequence meter disconnect requirement on source side of meter socket.
2. Limit to 200 Amperes - for exception see **ASM Section 200**.

3-WIRE, 240 VOLTS, THREE-PHASE SELF-CONTAINED (CORNER GROUNDED) (LIMITED TO 320 AMPERES CONTINUOUS / 400 AMPERES MAX) NON-STANDARD (NOTE 3)
Figure 1000-8

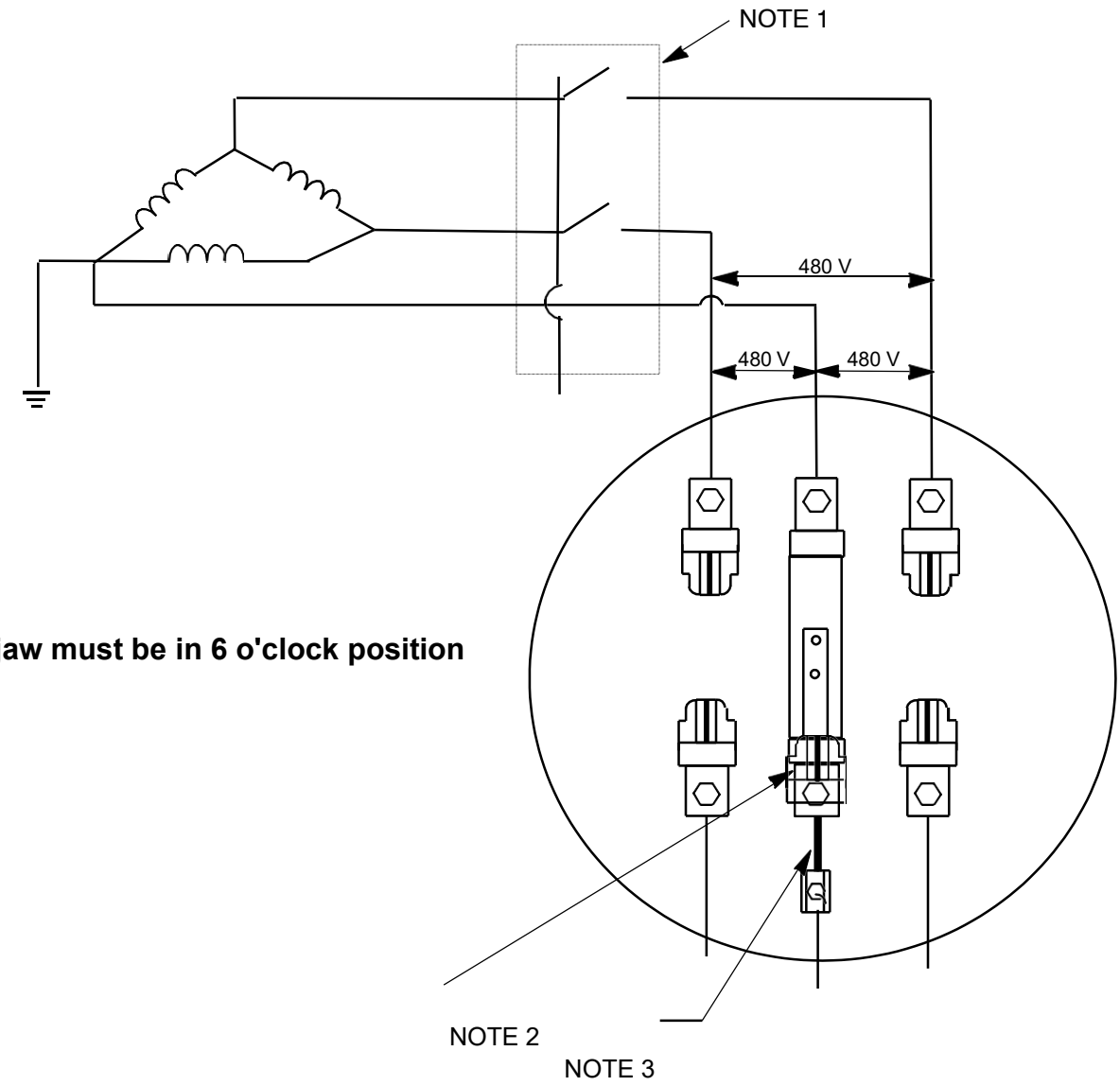


CONSTRUCTION NOTE(s): (FIGURE 1000-8)

1. Grounded phase in the center position of meter socket.
2. If 5th jaw is found at 9 o'clock position, it must be relocated in the field to 6 o'clock position for this service voltage listed above.
3. Refer to **ASM Section 400** for availability.

3-WIRE, 480 VOLTS, THREE-PHASE SELF-CONTAINED (CORNER GROUNED) (LIMITED TO 200 AMPERES) (NOTE 5) NON-STANDARD (NOTE 4)

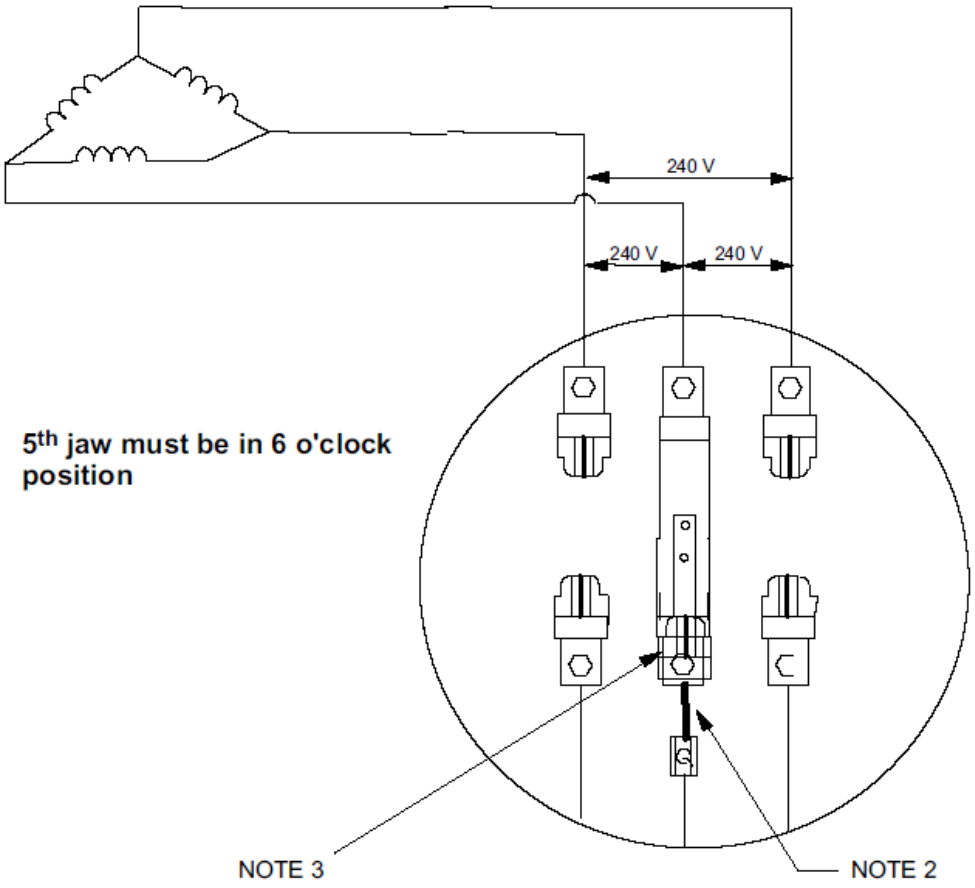
Figure 1000-9



CONSTRUCTION NOTE(s): (FIGURE 1000-9)

1. Knife blade switch without overcurrent protection fulfilling cold sequence meter disconnect requirement on source side of meter socket.
2. If 5th jaw is found at 9 o'clock position, it must be relocated in the field to 6 o'clock position for this service voltage listed above.
3. Grounded phase in the center position of meter socket.
4. Refer to **ASM Section 400** for availability.
5. Limit to 200 Amperes - for exception see **ASM Section 200**.

3-WIRE, 240 VOLTS, THREE-PHASE SELF-CONTAINED (UN-GROUNDED) (LIMITED TO 320 AMPERES CONTINUOUS / 400 AMPERES MAX) NON-STANDARD (NOTE 4)
Figure 1000-10

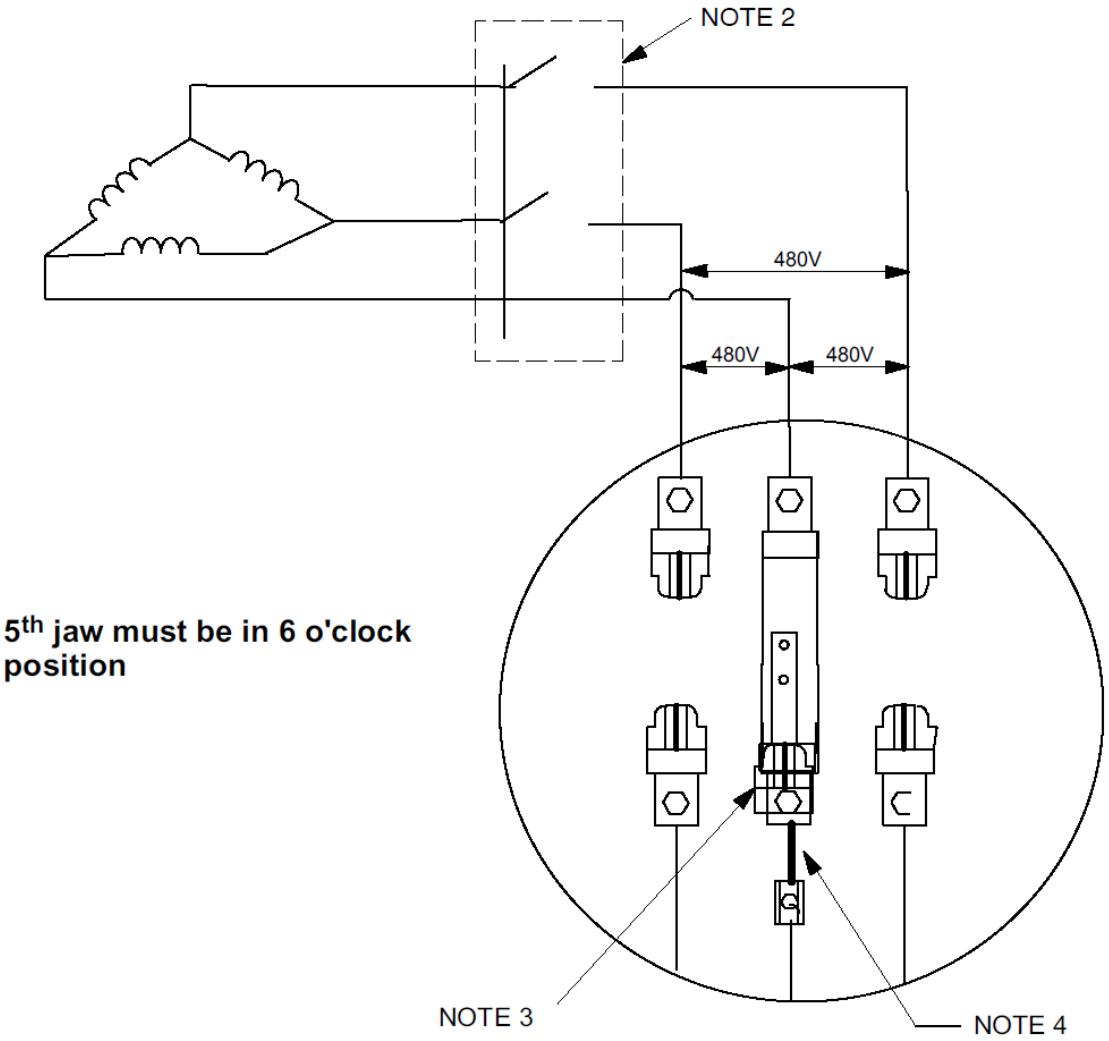


CONSTRUCTION NOTE(s): (FIGURE 1000-10)

1. Customer shall label meter socket: 3PH - 3W UN-Grounded Supply. Label shall be an engraved permanent placard and securely adhered to the meter socket.
2. Bonding strap between the center conductor and meter socket enclosure must be removed.
3. If 5th jaw is found at 9 o'clock position, it must be relocated in the field to 6 o'clock position for this service voltage listed above.
4. Refer to **ASM Section 400** for availability.

3-WIRE, 480 VOLTS, THREE-PHASE SELF-CONTAINED (UN-GROUNDED) (LIMITED TO 200 AMPERES) (NOTE 6)

Figure 1000-11



CONSTRUCTION NOTE(s): (FIGURE 1000-11)

1. Customer shall label meter socket: 3PH - 3W UN-Grounded Supply. Label shall be an engraved permanent placard and securely adhered to the meter socket.
2. Knife blade switch without over current protection fulfilling cold sequence meter disconnect requirement on source side of meter socket, list of approved devices provide in **ASM Section 1100**.
3. If 5th jaw is found at 9 o'clock position, and it must be relocated in the field to 6 o'clock position for this service voltage listed above.
4. Bonding strap between the center conductor and meter socket enclosure must be removed.
5. Refer to **ASM Section 400** for availability.
6. Limit to 200 Amperes - for exception see **ASM Section 200**.

Table 1000-3 Self-Contained Meter Socket Requirements

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="7">VOLTAGE</td></tr>
<tr><td>120/208V
1PH 3W
(NETWORK)</td><td>120/240V
1PH 3W</td><td>208Y/120V
3PH 4W</td><td>240V
3PH 3W &
240V
3PH 4W</td><td>240/480V
1PH 3W</td><td>480V
3PH 3W</td><td>480Y/277V
3PH 4W</td></tr>
<tr><td rowspan="3">SERVICE INSTALLATION AMPACITY</td><td>200 AMPS OR LESS</td><td colspan="4">PERMANENT: SELF-CONTAINED
CLAMP-JAW LEVER BYPASS METER SOCKET
TEMPORARY: HORN / CLAMP-JAW LEVER BYPASS NOT REQUIRED IN METER SOCKET</td><td colspan="3">SELF-CONTAINED
CLAMP-JAW LEVER BYPASS
METER SOCKET & LINE SIDE SAFETY SWITCH (KNIFE-BLADE SWITCH W/O OVERCURRENT PROTECTION)</td></tr>
<tr><td>201-320 /400 AMPS</td><td>N/A</td><td colspan="3">SELF-CONTAINED
CLAMP-JAW LEVER BYPASS METER SOCKET
(PERMANENT &TEMPORARY)</td><td colspan="3">SEE ASM SECTION 1001</td></tr>
<tr><td>401-3000 AMPS</td><td colspan="6">SEE ASM SECTION 1001</td></tr>
</table>

* Ameren Approved Metering Equipment List can be found at **BuildWithAmeren.com**.

1001.01 SERVICES

A) All service equipment must be installed and bonded / grounded per the latest edition of the NEC or local inspection authority. Refer to **ASM Section 500.**

B) Metering instrument transformers will not be allowed inside Ameren padmount transformers on any new service, upgraded service, or service modifications meeting Rewire Work Policy found in **ASM Section 200**.

C) Single phase 120/240 volts, three phase 208Y/120 volts, and three phase 240/120 volts Delta installations requiring **400 amperes continuous** and greater will require metering current transformers (CT).

D) For 240/480 volts, 480Y/277 volts, and 480 volts services greater than 200 amp, metering current transformers (CT) and potential transformers (PT) will be required. For exception, see **ASM Section 200**.

E) For 3 phase 3-wire 240 & 480 volts floating (ungrounded) delta, the unmetered phase will be a solid link and in the center position with CT enclosures.

F) For Corner Grounded Delta 3 phase 3-wire 240 & 480 volts installations, the unmetered, grounded phase will be in the center position, commonly called “B Phase”, within the CT enclosure.

G) Customer shall provide the proper CT / PT enclosure as specified below.

H) Ameren Missouri will provide the wire harnesses, meter socket, CTs and PTs.

I) Ameren Illinois will provide the wire harnesses, CTs and PTs.

J) Specific Ameren Illinois downtown areas of Bloomington, Champaign, Danville, Decatur, Galesburg, Normal, Ottawa, Peoria, and Urbana are designated as heavy underground, grid networks, and / or spot networks. Service restrictions are specific to their corresponding area and Customer should consult Company to determine the voltage and method of supply that will be available prior to beginning customer engineering or purchasing of equipment. Refer to **ASM Section 1350** for more details.

K) For Ameren Missouri, the Downtown St. Louis Underground District is the area bounded by Twenty-Second Street, Cole Street, Spruce Street, and the Mississippi River, and is designated as heavy underground, grid networks, and / or spot networks. Service restrictions are specific to their corresponding area and Customer should consult Company to determine the voltage and method of supply that will be available prior to beginning customer engineering or purchasing of equipment, refer to **ASM Section 1300**.

1001.02 REQUIREMENTS FOR METER STRUCTURE, WALL MOUNTED AND PADMOUNT CT / PT ENCLOSURE (UP TO 3000 AMPERES)

General Requirements

A) CT / PT enclosure must be certified by an approved independent testing laboratory using the appropriate standard for the certification. At present, Ameren recognizes UL and ETL as approved testing laboratories for equipment installed on the Ameren system. An approved list of CT / PT enclosures is available at **BuildWithAmeren.com.**

B) Enclosure must be hinged, sealable, pad lockable.

C) Provisions for terminating line and load conductors must be provided.

D) CT / PT enclosures must be mounted outside. Variances to this policy must be approved by the Field Metering Supervisor and Field Supervising Engineer. Only Ameren approved bussed enclosures will be allowed.

E) The customer is responsible for installing Ameren provided CTs and PTs.

F) Meter sockets shall normally be installed along the side of the CT / PT enclosures.

- Enclosures shall be installed so that any work to be performed by Ameren personnel can be done from final grade level without the aid of a ladder.
- Where this is impractical, contact the Field Metering Supervisor and Field Supervisor Engineer for direction.

G) CTs and PTs are required on all 480Y/277 volts and 480 volts services greater than 200 amperes. For exception, see **ASM Section 200**.

H) CTs are required on all 120/240, 208Y/120, 240/120, and 240 volts services 400 amperes continuous and larger.

I) Bar type CTs are used for the following installations:

- 480Y/277 volts and 480 volts services from 201 to 1200 amperes and
- 120/240 volts, 208Y/120 volts and 240/120 & 240 volts from 401 to 1200 amperes.

J) Large window CT is used for standard service voltage from 1201 to 3000 amperes.

K) For non-standard service voltages such as 240 and 480 volts 3-phase, 3-wire services. Refer to **ASM Section 400.03** for maximum service size.

L) 480 volts installations shall contain an Ameren approved side mounted potential transformer enclosure with 1 in. closed nipple. If longer than 6 in., make 1-1/2 in. continuous galvanized steel RMC with bonding bushing or schedule 40 or greater PVC conduit.

M) Potential transformer enclosure must be metal with a removable mounting bracket for installing PTs and must have the minimum dimension of 12 in. W x 36 in. H x 8 in. D.

N) Potential tap holes (#10 - 32 or ¼ in. - 20) shall be located on the bus closest to the front on the line side of the CT for each phase. Each hole shall be drilled and tapped through the entire bus, with lugs sized to accommodate a #10 wire, for each phase and neutral bus. Potential tap holes are not required for the individual phase for services from 201 through 1200 amperes; Potential tap holes and lugs are required for the neutral in all cases.

O) Conduit between the CT enclosure and meter socket shall be 1-1/2 in. galvanized steel RMC with bonding bushing, or schedule 40 (or greater) electric grade PVC. For Illinois, if using schedule 40 or greater electric grade PVC conduit, an equipment grounding conductor no smaller than #10 copper should be provided between the meter socket and CT enclosure. For Missouri installations, the equipment grounding conductor is provided in the 11 - conductor meter bundle (harness).

P) Meter bundle (harness) CT wire must not route through PT compartment to gain access to the meter enclosure.

Q) All service equipment, including CT enclosure must be grounded and bonded per the latest edition of the NEC or local inspection authority. Refer to **ASM Section 500** for Ameren grounding requirement.

R) CT enclosure must be mounted from 36 in. minimum to 66 in. maximum above finished grade to the center of the CT enclosure.

S) CT enclosure must be mounted on a flat, even surface such that the enclosure door should open and close properly. When mounted on an uneven surface, such as brick or architectural stone, uni-strut mounting of the enclosure is required. In any case, if CT enclosure doors do not open or close properly, Ameren may require installation of uni-strut or some other equivalent mounting structure to correct the problem.

T) Dimension requirements for Ameren approved CT / PT enclosures:

1). CT enclosures - wall mounted enclosure requirements:

TABLE 1001-1 WALLMOUNT CT ENCLOSURES DIMENSION REQUIREMENT

Ampacity Rating 1PH & 3PH Applications	Minimum Dimensions for Bottom Entry / Bottom Exit or Top Entry / Top Exit (W" x D" x H") (Note A1)	Min Dimensions for Bottom Entry / Bottom Exit or Top Entry / Top Exit with designated wire way inside enclosure (W" x D" x H") (Note A2)	Minimum Dimensions for Top Entry / Bottom Exit or Bottom Entry / Top Exit (W" x D" x H") (Note B1 & B2)
400A	36" x 15" x 60"	24" x 11" x 48"	24" x 10" x 48"
600A - 800A	36" x 15" x 60"	36" x 11" x 48"	24" x 10" x 48"
1200A	36" x 14" x 64" (Must add side gutter: 24" W x 15" D x 64" H)	46" x 14" x 54"	36" x 14" x 54"
1600A	40" x 14" x 64" (Must add side gutter: 24" W x 15" D x 64" H)	50" x 14" x 64"	36" x 14" x 60"
2000A	40" x 14" x 64" (Must add side gutter: 30" W x 15" D x 64" H)	50" x 14" x 64"	40" x 14" x 64"
2500A - 3000A	44" x 20" x 78" (Must add side gutter: 44" W x 21" D x 78" H)	50" x 20" x 72"	42" x 20" x 72"

CONSTRUCTION NOTE(s): (TABLE 1001-1)

A. Bottom Entry / Bottom Exit or Top Entry / Top Exit

1. **Installations where CT enclosures DO NOT require side gutters or wireways**: For **services 800 amps and less**, side gutters or wireways are not required. The minimum dimensions provided in the table above provide adequate room for routing cables along the side of the CT rack. Under no circumstance are service conductors to be routed under the CT rack.

2. **Installations where CT enclosures require side gutters or wireways:** For **services greater than 800 amps**, side gutters or designated wireways are required for training conductors to the left or right of the CT rack where the service conductors enter and exit the CT section from the same elevation. Such as line side conductors entering CT section from bottom and load side conductors exiting bottom portion of cabinet either through the side, back, or bottom plate. Side gutters or designated wireways would also apply for both line and load conductors entering and exiting at the top of the CT enclosure.
   When using the side gutter, either the line side or load side conduits (but not both) should land on this side gutter compartment to help train the conductors and to free up space inside the CT enclosure section.

B. Bottom Entry / Top Exit or Top Entry / Bottom Exit

The following CT rated installations do not require a side gutter or wireway:

1. Line side conductors entering bottom of CT enclosure. CT dots pointed down. Load side conductors leaving top portion of CT section. This would include exiting through the upper back.

2. Line side conductors entering top section of CT enclosure. CT dots pointed up. Load side conductors leaving bottom portion of CT enclosure. This would include exiting through the lower back.

2). CT enclosures - padmount requirements

TABLE 1001-2 PADMOUNT CT ENCLOSURES DIMENSION REQUIREMENT

Ampacity Rating 1PH & 3PH Applications	Minimum Dimensions for Padmount CT Enclosure (W" x D" x H") Two - Sided (Front & Rear) Compartment (Note 1)	Minimum Dimensions for Pad Mounted CT Enclosure One Sided Compartment (W" x D" x H")
400A	24" x 16" x 56"	24" x 13" x 58"
600A - 800A	24" x 16" x 56"	36" x 13" x 58"
1200A	40" x 30" x 74"	45" x 13" x 64"
1600A	40" x 30" x 74"	54" x 14" x 66"
2000A	40" x 30" x 74"	54" x 14" x 66"
2500A	44" x 42" x 88"	50" x 20" x 72"
3000A	44" x 42" x 88"	50" x 20" x 72"

CONSTRUCTION NOTE(s): (TABLE 1001-2)

1. Two sided compartments have a barrier that runs between the front half and the rear half of the enclosure allowing incoming cables to run up the back half and terminate near the top of the enclosure on lugs attached to buss bars that run down the front half of the enclosure for mounting metering current transformers.

3) PT enclosure requirement
- Potential transformer enclosure must be metal with a removable mounting bracket for installing PTs and must have minimum dimensions of 12 in. W x 36 in. H x 8 in. D.

1001.03 SWITCHBOARDS (SECONDARY, BELOW 600 VOLTS)

General requirements for CT / PT compartments in switchboards (Up to 4000 amperes)

A) Customer owned switchboards utilized for Service Equipment must contain a Main Service Disconnecting Mean and associated overcurrent protection. This may consist of a group operated knife blade switch(s) and fuse(s), or in lieu of the aforementioned, a circuit breaker(s). Customer may elect to incorporate a utility metering section within the switchboard lineup but MUST be approved by Field Metering Supervisor and Field Supervising Engineer early in design stage for availability of indoor application(s).

B) When incorporating utility metering within a switchboard lineup, it must contain dedicated compartment(s) for the purpose of housing Ameren provided current and voltage transformers. PT compartments are only required for 480Y/277 volts and 480 volts services. Refer to **ASM Section 200** for location requirements and **ASM Section 1001.03(T)** for minimum dimension requirements for the CT / PT compartments.

C) These compartments must be dedicated to Ameren equipment. Front hinged doors shall be provided with padlocking and sealing provisions for securing by Ameren.

D) CTs and PTs must be readily accessible from the front of switchboards for ease of installation and removal.

E) Busbar for all phases and a neutral reference lugging system shall be included in this section. Some manufacturers may choose to run the neutral busbar through this section as an alternative to the neutral lugging system.

F) CT and PT compartments must be hinged and pad lockable. Separate doors must be provided for the CT and PT compartment(s).

G) No obstructions or busbar that might restrict free and easy access to the CTs and PTs are allowed in front (hinged door side) of the CT or PT.

H) Customer equipment shall not be located within or accessible through this dedicated compartment(s).

I) CT and PT compartments must be separated and have barriers from other customer compartments to prevent access.

J) Metered and un-metered conductors shall be separated by insulated barriers.

K) Ameren meter / main switch shall be arranged in hot sequence configuration, allowing the meter to remain hot when main service disconnect is in the off position.

L) Potential tap holes (#10 - 32 or ¼ in. - 20) shall be located on the line side of the bus closest to the front, drilled and tapped through the entire bus, with lugs sized to accommodate a #10 gauge conductor, for each phase and neutral bus.

M) Outdoor located CT / PT switchboard sections shall be weather and rain resistant (NEMA Type 3R).

N) All switchboards must be UL / ETL listed and meet minimum UL / ETL requirements for steel and aluminum structures.

O) Bottom of CT / PT section shall be no lower than 24 in. for both underground and overhead fed switchboards.

P) Top of CT / PT section shall be no higher than 78 in.

Q) All service equipment must be grounded and bonded per latest edition of the NEC or local inspection authority. Refer to **ASM Section 500** for Ameren grounding requirements.

R) Refer to **ASM Section 1001** for Ameren approved switchboard manufacturer drawings for CT and PT sections for 600 volts and below switchboards. Switchboards built per one of these approved drawings do not require Ameren approval prior to manufacture or installation. Switchboards not meeting one of these drawings must be approved by the Ameren Metering Department prior to manufacture.

S) Refer to **ASM Section 400** for non-standard service voltages such as 240 and 480 volts 3-phase 3-wire maximum service sizes.

T) Dimension requirements for CT and PT compartments in switchboards

1) CT compartment dimensions and requirements

- 401-4000 amperes: 120/240 volts, 240 volts, 240/120 volts, 208Y/120 volts
- 201-4000 amperes: 240/480 volts, 480Y/277 volts, 480 volts

a) Minimum dimensions 35 in. W x 22 in. H x 12 in. D

⁎ Provision for mounting **bar type current transformers:**
- 480Y/277 volts or 480 volts services from 201-1200 amperes,
- 120/240 volts, 240/120 volts, 208Y/120 volts and 240 volts services from 401-1200 amperes

⁎ Provisions for mounting large **window current instrument transformers** (5 ¾ in. window diameter) using non-conductive angle bracket(s) for mounting window CTs on:
- Standard service voltage from 1201 to 4000 amperes

b) For window type CT installations, a removable busbar section must be provided so that the CTs can be fitted onto the busbar. No cable is allowed to pass through the window CT, only busbar.

2) PT compartment for 480Y/277 and 480 volts services
a) Minimum dimensions 35 in. W x 8 in. H x 8 in. D
b) An 8 in. bracket, or shelf extending the full width of the PTs compartment for mounting the PTs shall be provided.
c) Bracket or shelf should be strong enough to safely support up to 3 PTs.
d) The PT compartment must be located directly above or below the CT compartment. An insulated barrier between the CT and PT sections must be provided. Provisions for routing the meter bundle (harness) between these compartments must be provided.

1001.04 METER SOCKETS - INSTRUMENT RATED

1. Only Ameren approved pre-wired meter sockets, including color coded test switches, will be utilized on new installations.

   Ameren Missouri will provide the meter sockets - instrument rated.

   In Ameren Illinois, the customer / contractor will provide the meter sockets - instrument rated.
   Refer to **ASM Section 1100** - Ameren Approved Metering Equipment List.

2. Customer will be responsible for the installation of CT / PT enclosure, CT / PT, meter socket, and conduit.

   The customer is responsible for installing the conduit between the meter socket and the CT enclosure. Refer to **ASM Section 1001.05** for the installation of a metering bundle (harness).

   No LB is allowed between meter socket and CT enclosure unless prior approval is received from Ameren Metering Department.

3. Meter sockets shall normally be mounted on a wall or an appropriate structure alongside of the CT / PT enclosure as close as practical.

   Indoor instrument rated meter socket locations are typically not allowed. Exceptions to this policy must be pre-approved by Field Metering Supervisor and Field Supervising Engineer.

   Enclosures shall be installed so that any work to be performed by Ameren can be done from final grade level without the aid of a ladder.

Where this is impractical, contact the Field Metering Supervisor and Field Supervising Engineer for direction.

4. Conduit between the CT / PT enclosure and meter socket shall be 1-1/2 in. galvanized steel RMC, aluminum RMC, or galvanized EMT with bonding bushing, or schedule 40 (or greater) electric grade PVC. If schedule 40 (or greater) electric grade PVC conduit is used, an equipment grounding conductor no smaller than #10 copper should be provided between the meter socket and enclosure. For Missouri installations this bonding jumper is provided in the 11/C meter bundle (harness).
5. Ameren will terminate the metering conductor on each end.

1001.05 CURRENT / POTENTIAL TRANSFORMERS WIRING - UNDER 600V

A) CT / PT Secondary Wiring

1. Ameren Missouri

   A) Ameren provided customer installed 11/C, #12 Cu wire - up to 55 ft.

   B) Customer / contractor provided and installed 11/C, #10 Cu wire - 55 to 90 ft.

   Note: For distances greater than 55 ft, Ameren will provide a location where approved meter bundle (harness) can be purchased by the customer / contractor. Only Ameren approved meter bundle (harness) with proper sheath, wire and wire color will be allowed. Other wire sizes, requests for greater CT and meter separations, and metering CT sizing should be reviewed by the Meter Engineering.

2. Ameren Illinois

   A) Ameren provided and installed 8/C #12, Cu wire - up to 55 ft.

   B) Customer / contractor provided, and Ameren installed 8/C, #10 Cu wire - 55 to 90 ft.

   Note: For distances greater than 55 ft, Ameren will provide location where approved meter bundle (harness) can be purchased by the customer / contractor. Only Ameren approved meter bundle (harness) with proper sheath, wire and wire color will be allowed. Other wire sizes, requests for greater CT and meter separations, and primary metering CT sizing should be reviewed by Meter Engineering.

   C) If the meter socket cannot be located adjacent (within 15 ft) to the CT / PT enclosure, contact your Engineering Representative to discuss options.

TABLE 1001-3 TRANSFORMER RATED METERING REQUIREMENTS

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="7">VOLTAGE</td></tr>
<tr><td>120/208V
1PH 3W
(NETWORK)</td><td>120/240V
1PH 3W</td><td>208Y/120V
3PH 4W</td><td>240V
3PH 3W &
240V
3PH 4W</td><td>240/480V
1PH 3W</td><td>480V
3PH 3W</td><td>480Y/277V
3PH 4W</td></tr>
<tr><td rowspan="7">SERVICE INSTALLATION AMPACITY</td><td>200 AMPS OR LESS</td><td colspan="4">SEE ASM SECTION 1000</td><td colspan="3">SEE ASM SECTION 1000</td></tr>
<tr><td>201-320/
400 AMPS</td><td>N/A</td><td colspan="3">SEE ASM SECTION 1000</td><td colspan="3">CT/PT METERING BAR TYPE**</td></tr>
<tr><td>401-600 AMPS</td><td>N/A</td><td colspan="3">CT METERING (BAR TYPE CTS)</td><td>N/A</td><td>CT / PT METERING (BAR TYPE CTS)</td><td rowspan="3">CT / PT METERING (BAR TYPE CTS)</td></tr>
<tr><td>601-800 AMPS</td><td>N/A</td><td colspan="2">CT METERING (BAR TYPE CTS)</td><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td>801-1200 AMPS</td><td>N/A</td><td>N/A</td><td>CT METERING (BAR TYPE CTS)</td><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td>1201-3000 AMPS</td><td>N/A</td><td>N/A</td><td>CT METERING (LARGE WINDOW TYPE CTS)</td><td>N/A</td><td>N/A</td><td>N/A</td><td>CT / PT METERING (LARGE WINDOW TYPE CTS)</td></tr>
</table>

* Ameren Approved Metering Equipment List can be found at **BuildWithAmeren.com**

** For exception refer to **ASM Section 200**.

1001.06 PICKUP OF COMPANY FURNISHED METER ITEMS (AMEREN MISSOURI)

Company furnished instrument rated meter sockets, CTs, PTs, and wire bundle (harness) are to be picked up by the customer / contractor based on job location as follows:

A) In St. Louis City, St. Louis County, Jefferson County and St. Charles, please contact:

Dorsett System Meter Shop
Phone: 314-702-5012
Address: Ameren Missouri Dorsett Facility
12121 Dorsett Road
Maryland Heights, MO 63043

B) In other MO areas, contact the local district office.

Communication of the requirements for this metering equipment should be done well in advance of the need installation date.

Customer / contractor must provide a job number provided by Ameren Missouri to pick up the equipment. Material will not be issued without a valid job number.

1001.07 DELIVERY OF COMPANY FURNISHED METER ITEMS (AMEREN ILLINOIS)

Company furnished CTs and PTs, and wire bundle (harness) will be delivered by Ameren Illinois Meter Department to the site. Communication for this metering equipment should be done well in advance of need of installation date. Coordinate delivery of metering instruments through your local Ameren Engineering Representative.

1001.08 LOW VOLTAGE (UNDER 600V) SWITCHBOARD AND SWITCHGEAR APPLICATIONS

Summary of Key Technical Difference:

1) Switchboards and switchgear are built to different standards (applicable standards are in the white paper). Per these standards, Low Voltage (LV) switchgear only uses Low Voltage Power Circuit Breakers (LVPCB). However, LV switchboards can use a variety of protective devices to include LVPCB, insulated case circuit breakers (ICCB), molded case circuit breakers (MCCB), and fuses.

2) Switchgear is a more robust design that may be better suited for certain environments. LV switchgear is often the preferred LV main gear in harsher environments (e.g., industrial manufacturing, water, and wastewater treatment plants)

   a. The protective devices in LV switchgear are mounted in metal-enclosed compartments. In typical switchboards, the protective devices share a common environment with cabling and bussing. Some switchboards may provide compartmentalization of protective devices, but they are not built to the metal-enclosed standards of LV switchgear unless specifically listed otherwise. However, these standards may still comply with 2020 NEC 230.71 provided each main service disconnect is in its own vertical section and where there are barriers separating each vertical section.

   b. The standard for switchboard uses a 3-cycle short circuit test. LV switchgear requires a 30-cycle short circuit test (this allows LVPCB's in switchgear to be used without instantaneous trip protection in some cases.

   c. LVPCB's are inherently 100% rated devices. Some breakers used in switchboards may be 80% rated (typical for MCCB's)

3) In modern LV switchgear, all circuit breakers are drawout and individually mounted. In switchboards, drawout mounting or individual mounting is an option for some frame sizes.

* More in-depth analysis of the differences between LV switchboard versus switchgear can be found at The Application of Switchgear and Switchboards (abb.com).

1001.09 MEDIUM VOLTAGE (600V - 69KV) METAL-CLAD & METAL-ENCLOSED SWITCHGEAR APPLICATIONS

Like LV Switchboard and Switchgear, Medium Voltage (MV) Metal Clad & Metal-Enclosed Switchgear have similarities and differences. Although these categories of gear are beyond the scope of the Ameren Electric Service Manual, which is focused on low voltage service, two references are provided below for customers with higher power demands that may require primary voltage service. Refer to **ASM Section 400** for further information on primary distribution service.

Metal-Clad Switchgear or Metal-Enclosed Switchgear: Which is it?
Metal Enclosed vs. Metal Clad Switchgear

1001.10 CT / PT ENCLOSURE INSTALLATION DRAWINGS

Figure 1001-1	120/240 VOLTS, 1-PHASE, 3-WIRE, 401 - 800 AMPERES
Figure 1001-2	240/480 VOLTS, 1-PHASE, 3-WIRE, 201 - 400 AMPERES
Figure 1001-3	240/120 VOLTS, 3-PHASE, 4-WIRE, 401 - 600 AMPERES
Figure 1001-4	208Y/120 VOLTS, 3-PHASE, 4-WIRE, 401 - 1200 AMPERES
Figure 1001-5	208Y/120 VOLTS, 3-PHASE, 4-WIRE, 1201 - 3000 AMPERES
Figure 1001-6	480Y/277 VOLTS, 3-PHASE, 4-WIRE, 201 - 1200 AMPERES
Figure 1001-7	480Y/277 VOLTS, 3-PHASE, 4-WIRE, 1201 - 3000 AMPERES
Figure 1001-8	240 VOLTS, 3-PHASE, 3-WIRE, CORNER GROUNDED DELTA, 401 - 600 AMPERES (NON-STANDARD)
Figure 1001-9	240 VOLTS, 3-PHASE, 3-WIRE, FLOATING (UNGROUNDED) DELTA 401 - 600 AMPERES (NON-STANDARD)
Figure 1001-10	480 VOLTS, 3-PHASE, 3-WIRE, CORNER GROUNDED DELTA, 201 - 600 AMPERES (NON-STANDARD)
Figure 1001-11	480 VOLTS, 3-PHASE, 3-WIRE, DELTA, FLOATING (UNGROUNDED) DELTA, 401 - 600 AMPERES (NON-STANDARD)
Figure 1001-12	CT ENCLOSURE - SIDE GUTTER

1001.11 SWITCHBOARD / SWITCHGEAR (UNDER 600 VOLT) DRAWINGS

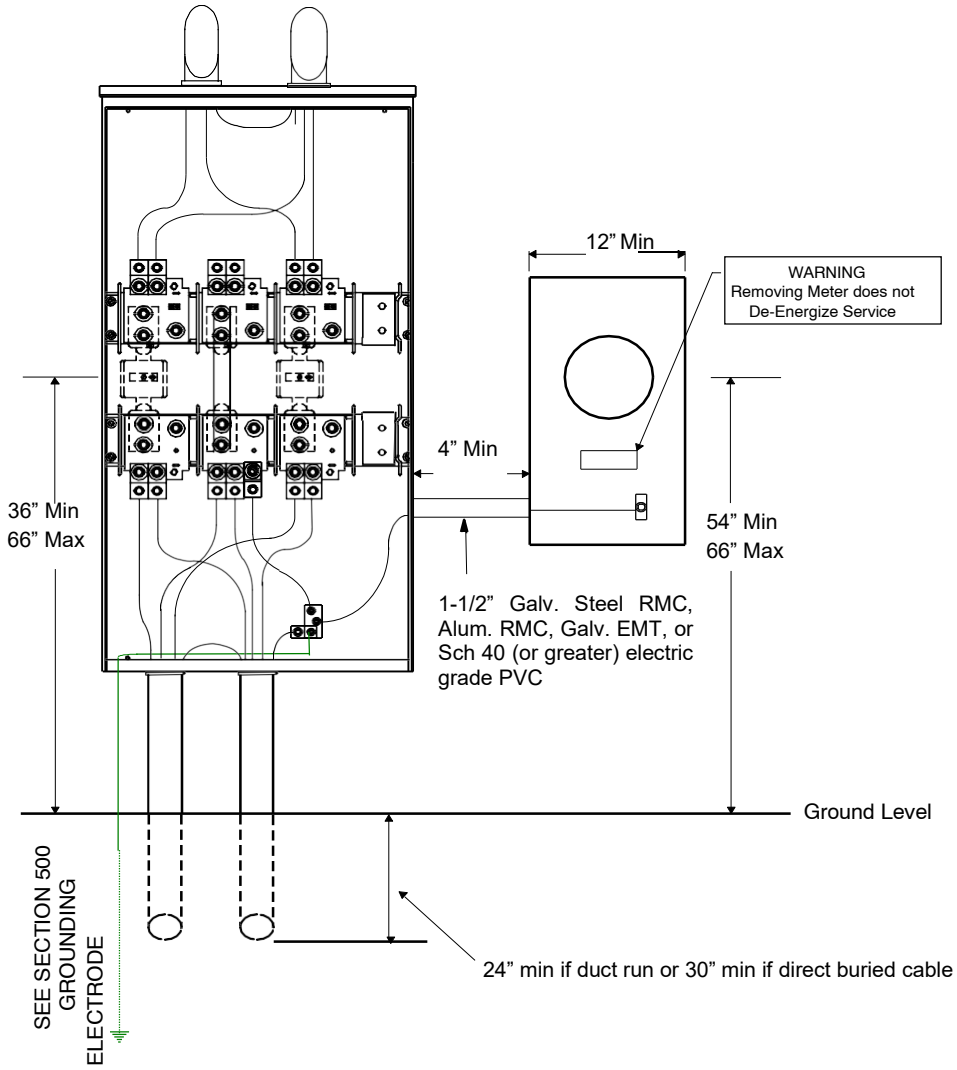
Contact the local Ameren office to determine if drawings are required, or if approval is needed.

1. AMEREN APPROVED SWITCHBOARD - **EATON / CUTLER-HAMMER**
   CT / PT COMPARTMENT
   Figure 1001-1A (Sheet 2 of 4): 208Y/120V, 800 - 1200A OH FEED
   Figure 1001-1A (Sheet 1 of 4): 208Y/120V, 1201 - 4000A OH FEED
   Figure 1001-1A (Sheet 4 of 4) : 208Y/120V, 800 - 1200A UG FEED
   Figure 1001-1A (Sheet 3 of 4): 208Y/120V, 1201 - 4000A UG FEED
   Figure 1001-1B (Sheet 2 of 4): 480Y/277V, 800 - 1200A OH FEED
   Figure 1001-1B (Sheet 1 of 4): 480Y/277V, 1201 - 4000A OH FEED
   Figure 1001-1B (Sheet 4 of 4): 480Y/277V, 800 - 1200A UG FEED
   Figure 1001-1B (Sheet 3 of 4): 480Y/277V, 1201 - 4000A UG FEED
2. AMEREN APPROVED SWITCHBOARD - **SIEMENS** CT / PT COMPARTMENT
   Figure 1001-2A (Sheet 1 of 2): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES
   Figure 1001-2A (Sheet 2 of 2): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES
   Figure 1001-2B (Sheet 1 of 2): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
   Figure 1001-2B (Sheet 2 of 2): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
   Figure 1001-2C: 208Y/120V, 480Y/277V, 4000 AMPERES ALTERNATE
   ENERGY TAP COMPARTMENT
3. AMEREN APPROVED SWITCHBOARD / SWITCHGEAR - **ABB / GE**
   CT / PT COMPARTMENT
   Figure 1001-3A (Sheet 83): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES
   Figure 1001-3A (Sheet 82): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
   Figure 1001-3C (Sheet 1): PHYSICAL DIMENSION, 208Y/120; 480Y/277,
   1201 - 4000 AMPERES
4. AMEREN APPROVED SWITCHBOARD - **SQUARE D / SCHNEIDER**
   CT / PT COMPARTMENT
   Figure 1001-4A (Sheet 1 of 3): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES
   Figure 1001-4A (Sheet 2 of 3): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES
   Figure 1001-4A (Sheet 3 of 3): 208Y/120V; 480Y/277V, 800 - 1200 AMPERES
   Figure 1001-4B (Sheet 1 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
   Figure 1001-4B (Sheet 2 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
   Figure 1001-4B (Sheet 3 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
   Figure 1001-4B (Sheet 4 of 4): 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES

5. AMEREN APPROVED SWITCHBOARD - **AMERICAN MIDWEST POWER (AMP)**
   CT / PT COMPARTMENT
   Figure 1001-5A: 208Y/120V, 800 - 1200 AMPERES
   Figure 1001-5B: 208Y/120V, 1201 - 4000 AMPERES
   Figure 1001-5C: 480Y/277V, 800 - 1200 AMPERES
   Figure 1001-5D: 480Y/277V, 1201 - 4000 AMPERES
   Figure 1001-5E: 480 V, 3-PH, 4-WIRE METER CENTER
   Figure 1001-5F: 480 V, 3-PH, 4-WIRE METER CENTER

6. AMEREN APPROVED SWITCHBOARD - **ELECTRO-MECHANICAL INDUSTRIES INC (EMI)**
   CT / PT COMPARTMENT
   Figure 1001-6A: 208Y/120V; 480Y/277V, 800 - 1200 AMPERES OVERHEAD FEED
   Figure 1001-6B: 208Y/120V; 480Y/277V, 800 - 1200 AMPERES UNDERGROUND FEED
   Figure 1001-6C: 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES OVERHEAD FEED
   Figure 1001-6D: 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES UNDERGROUND FEED

120/240 VOLTS, 1-PHASE, 3-WIRE, 401 - 800 AMPERES
Figure 1001-1

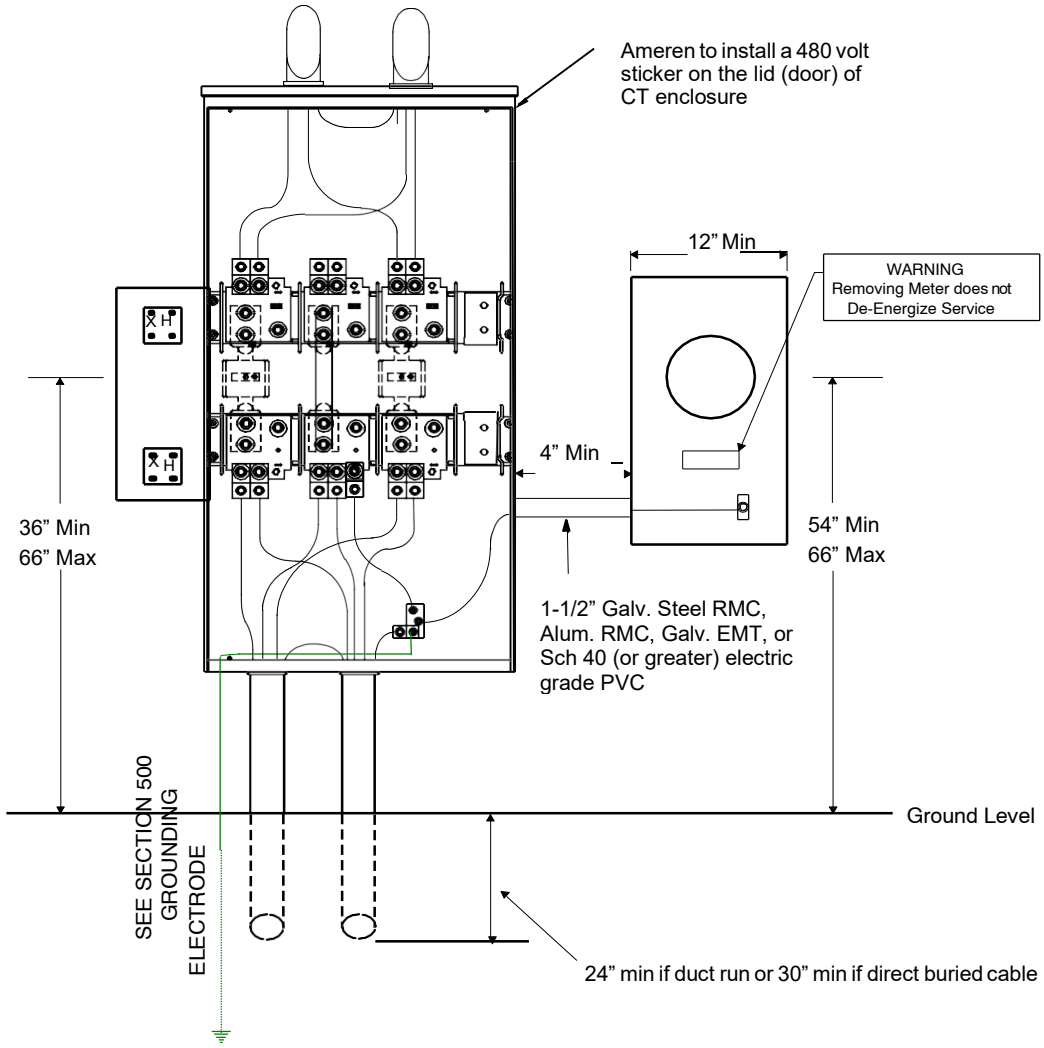


120/240 VOLTS, 1-PHASE, 3-WIRE, 401 - 800 AMPERES
Figure 1001-1

CONSTRUCTION NOTE(s): (FIGURE 1001-1)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. maximum above final grade.
4. Requires bar type CTs for outside phases.
5. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
6. For single phase installations, the neutral may be landed in the center position with a solid link or it may be positioned off to the side on a neutral lugging system.

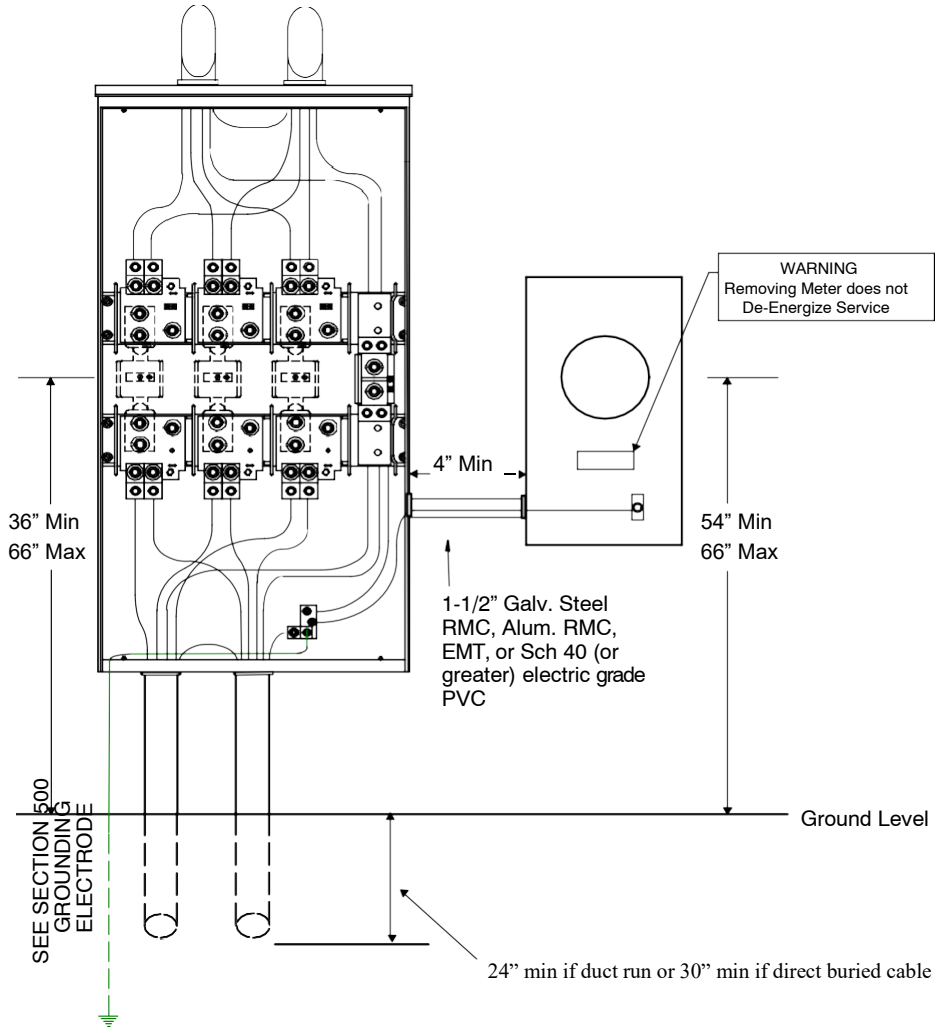
240/480 VOLTS, 1-PHASE, 3-WIRE, 201 - 400 AMPERES
Figure 1001-2



CONSTRUCTION NOTE(s): (FIGURE 1001-2)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. maximum above final grade.
4. Requires bar type CTs for outside phases.
5. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
6. For single phase installations, the neutral may be landed in the center position with a solid link or it may be positioned off to the side on a neutral lugging system.

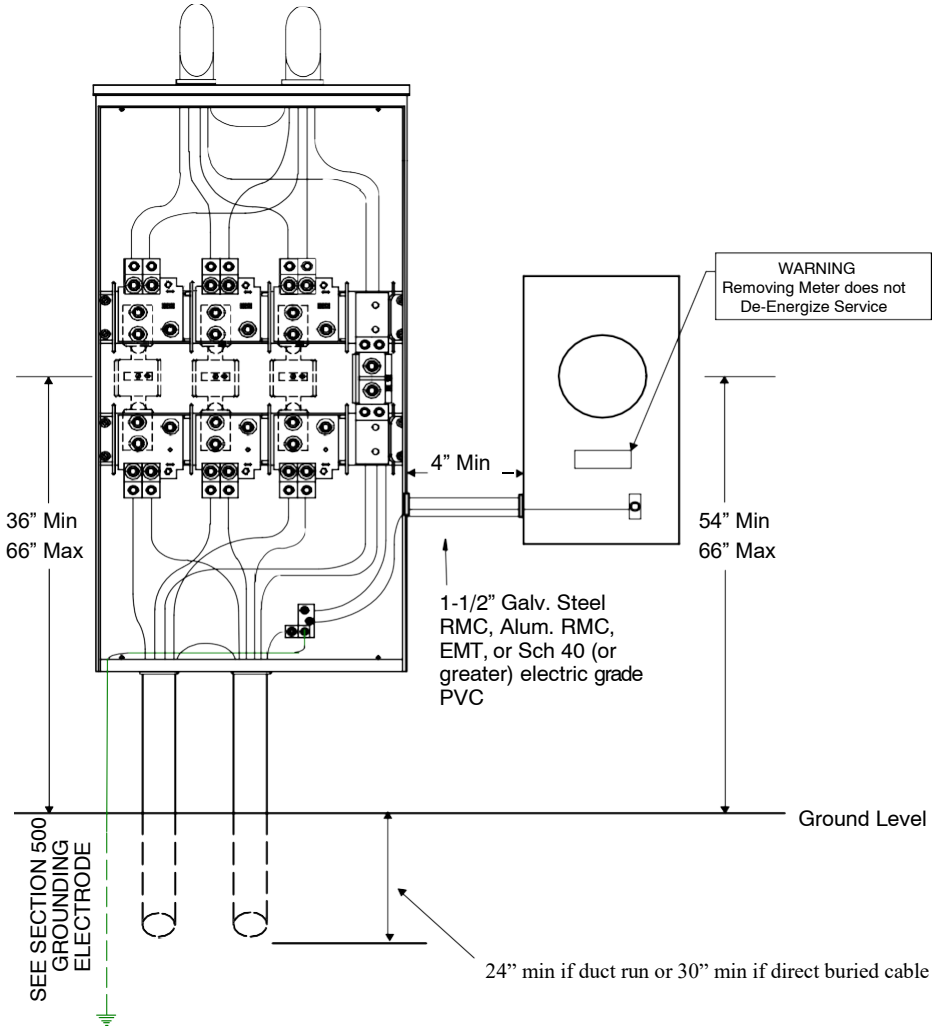
240/120 VOLTS, 3-PHASE, 4-WIRE 401 - 600 AMPERES
Figure 1001-3



CONSTRUCTION NOTE(s): (FIGURE 1001-3)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. Maximum above final grade.
4. Requires bar type CTs for outside phases.
5. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
6. Refer to **ASM Section 400** for availability.

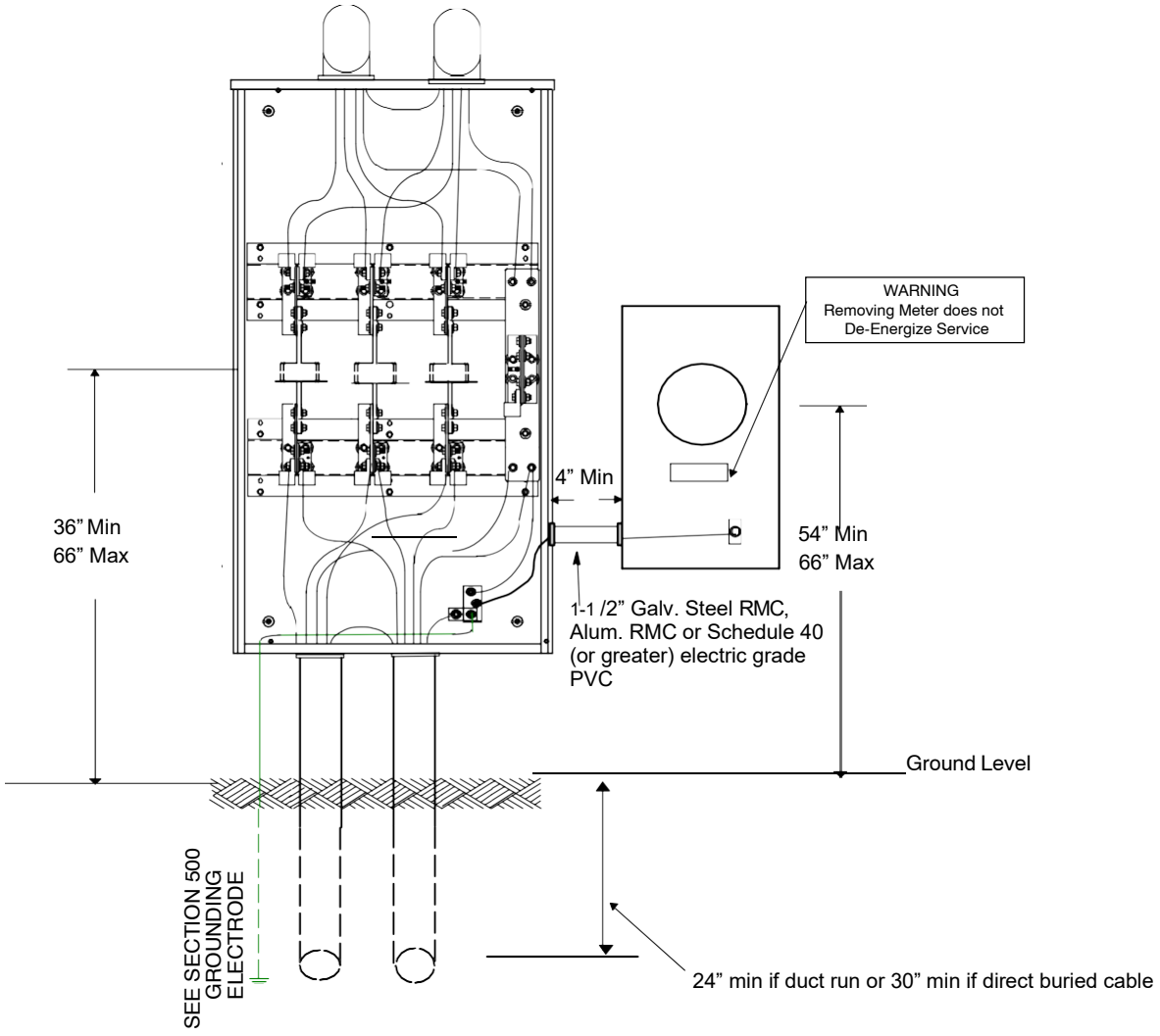
208Y/120 VOLTS, 3-PHASE, 4-WIRE, 401 - 1200 AMPERES
Figure 1001-4



CONSTRUCTION NOTE(s): (FIGURE 1001-4)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. Maximum above final grade.
4. Requires bar type CTs.
5. Neutral conductors will terminate along the side of the enclosure.
6. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
7. Refer to **ASM Section 400** for availability.

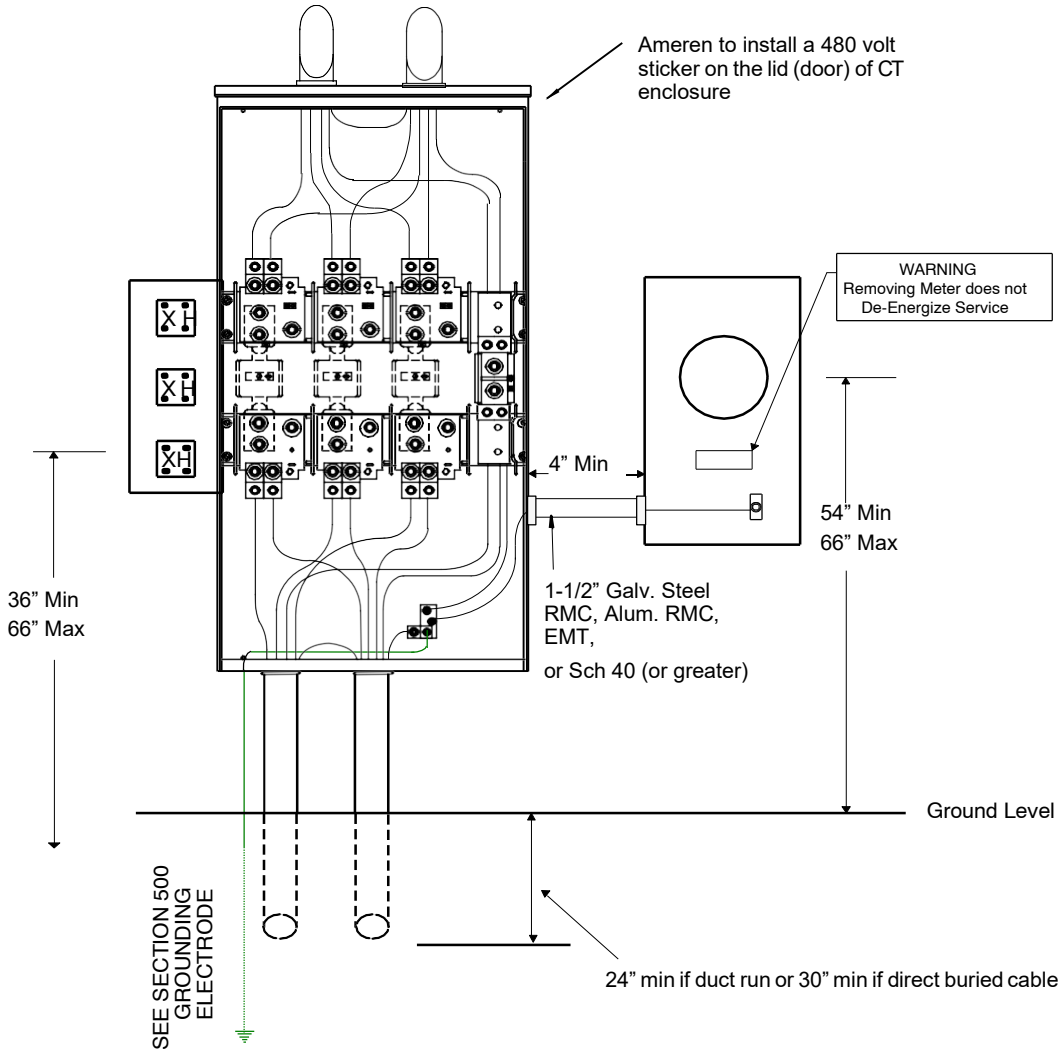
208Y/120 VOLTS, 3-PHASE, 4-WIRE 1201 – 3000 AMPERES
Figure 1001-5



CONSTRUCTION NOTE(s): (FIGURE 1001-5)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. Maximum above final grade.
4. Neutral conductors will terminate along the side of the enclosure.
5. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
6. Requires large window-type CTs.

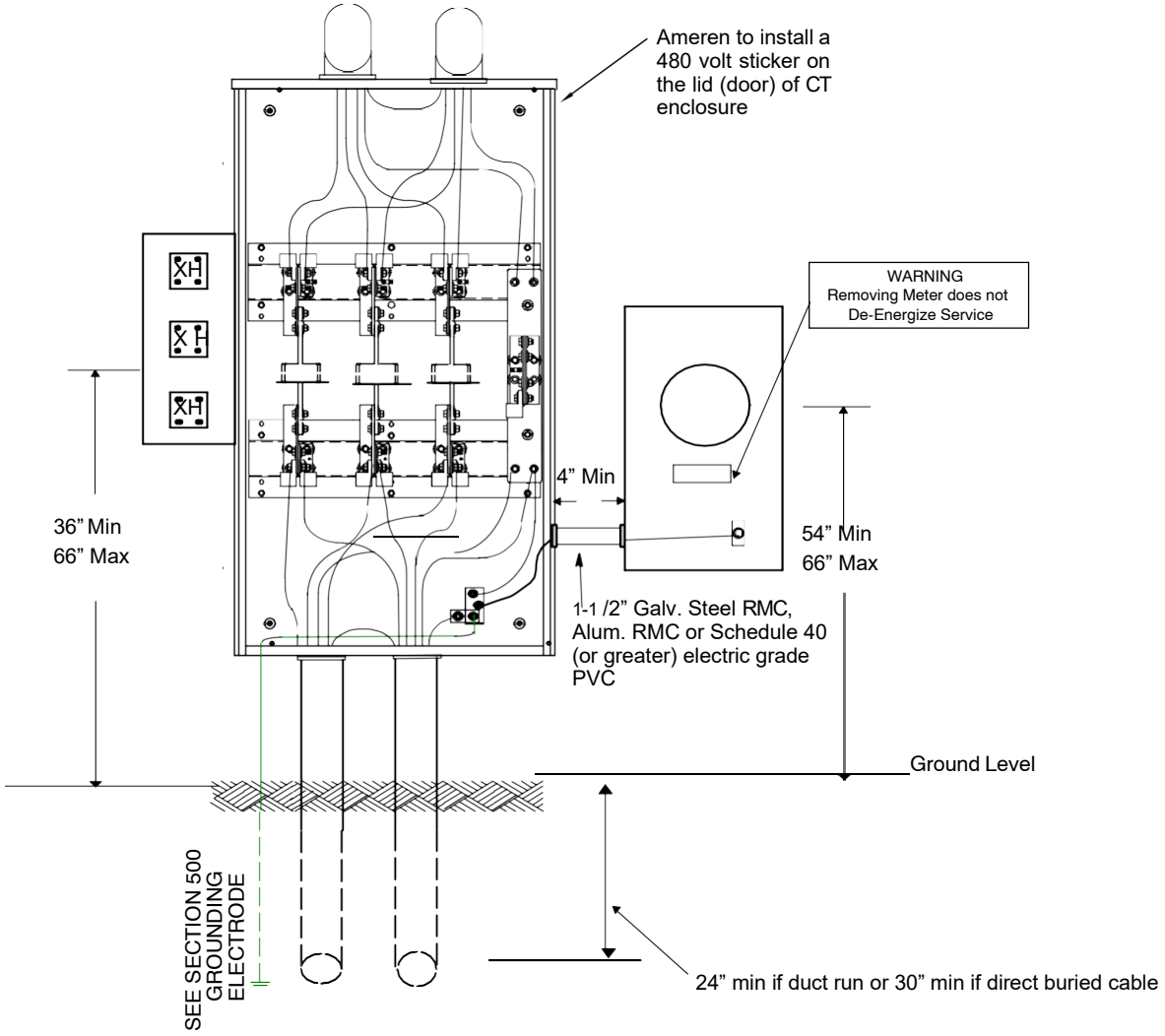
480Y/277 VOLTS, 3-PHASE, 4-WIRE 201 – 1200 AMPERES
Figure 1001-6



CONSTRUCTION NOTE(s): (FIGURE 1001-6)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. Maximum above final grade.
4. Neutral conductors will terminate along the side of the enclosure.
5. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
6. Requires bar-type CTs.

480Y/277 VOLTS, 3-PHASE, 4-WIRE 1201 - 3000 AMPERES
Figure 1001-7

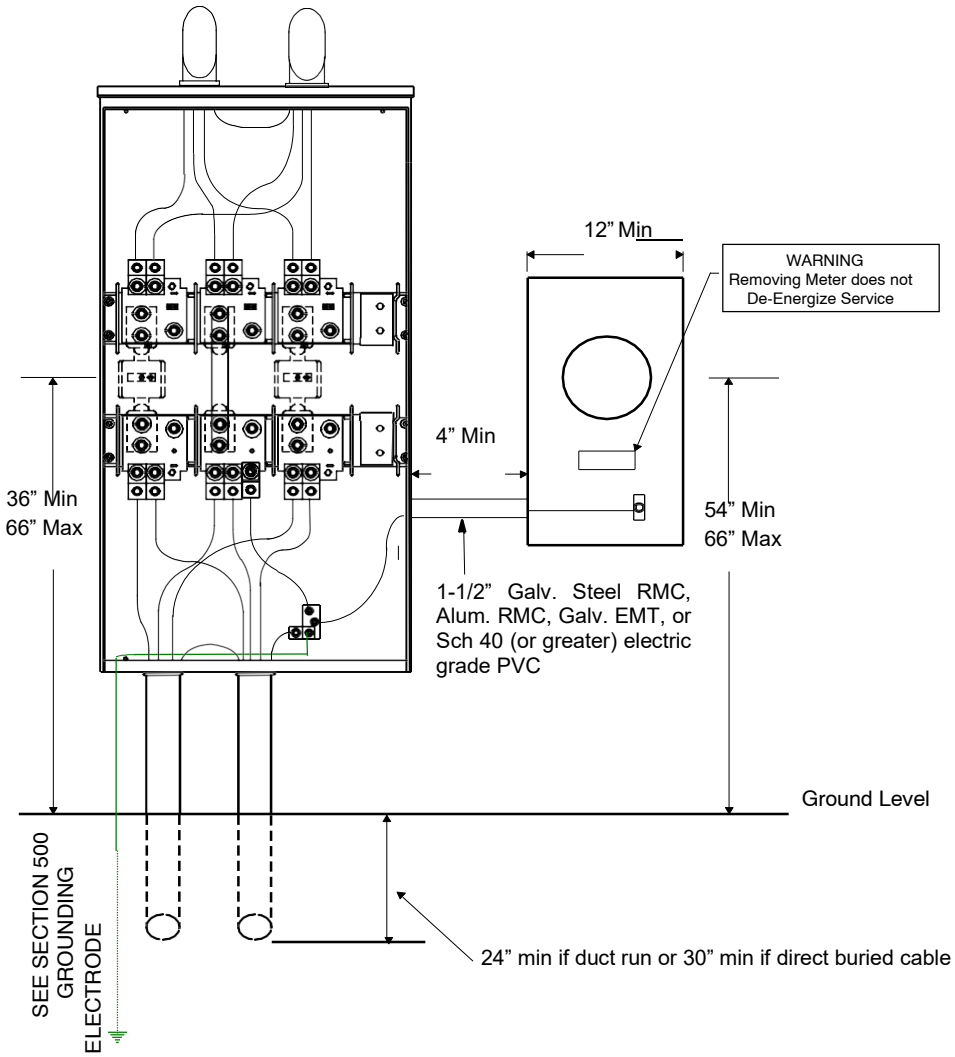


CONSTRUCTION NOTE(s): (FIGURE 1001-7)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. Maximum above final grade.
4. Neutral conductors will terminate along the side of the enclosure.
5. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
6. Requires large window-type CTs.

240 VOLTS, 3-PHASE, 3-WIRE 401 - 600 AMPERES CORNER GROUNDED DELTA (NON-STANDARD, SEE NOTE 6)

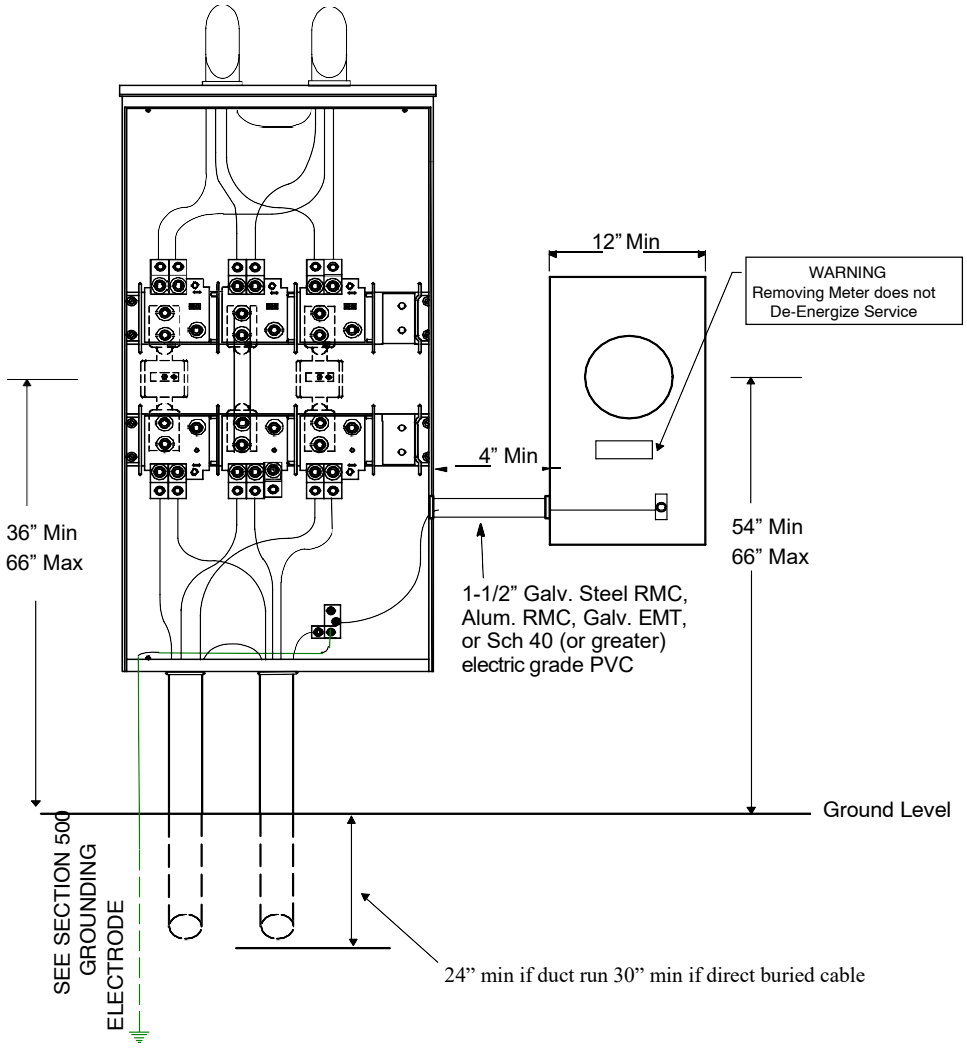
Figure 1001-8



CONSTRUCTION NOTE(s): (FIGURE 1001-8)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. maximum above final grade.
4. Requires bar type CTs for outside phases.
5. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
6. Refer to **ASM Section 400** for availability.
7. For three-phase, corner grounded delta, the center position will be a solid link and grounded "B" phase.

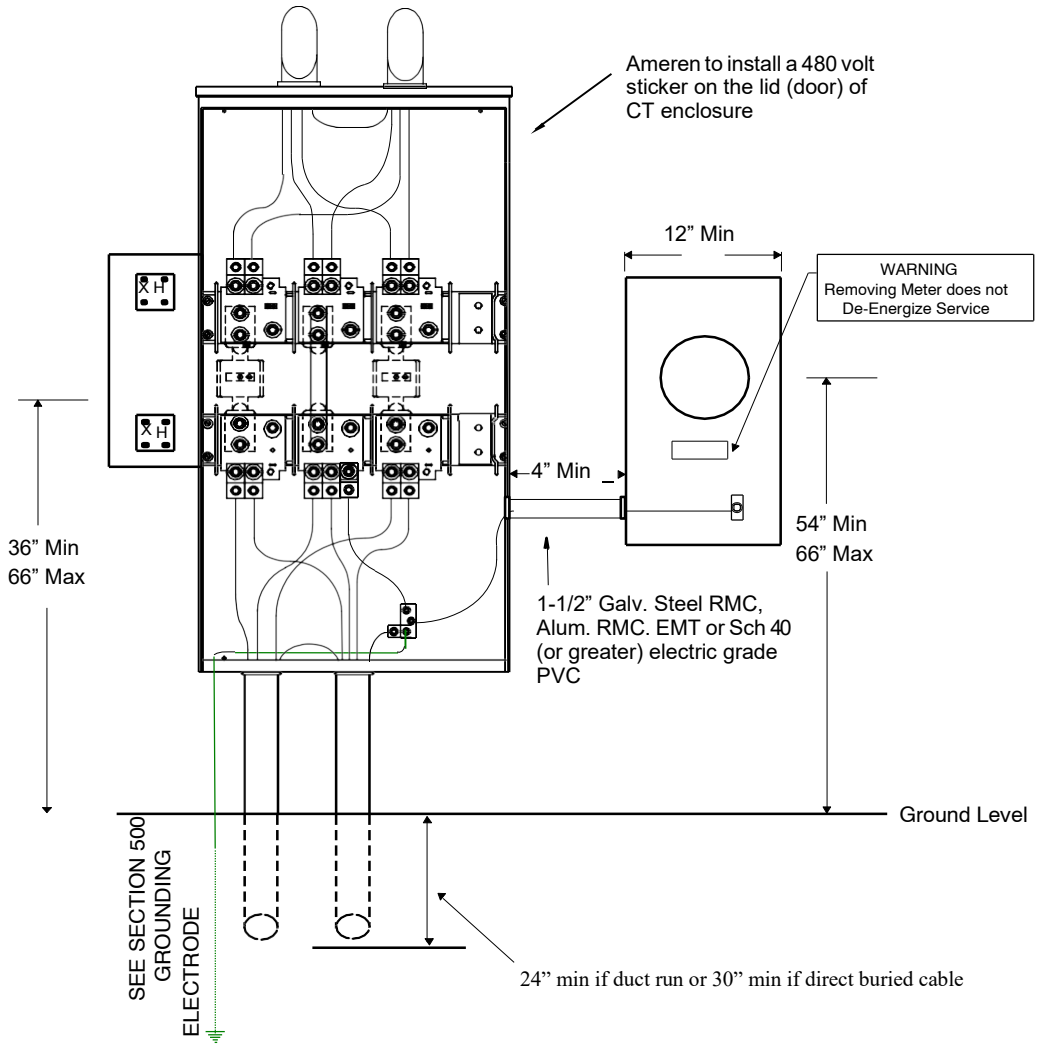
240 VOLTS, 3-PHASE, 3-WIRE FLOATING (UNGROUNDED) DELTA
401 - 600 AMPERES
(NON-STANDARD - SEE NOTE 6)
Figure 1001-9



CONSTRUCTION NOTE(s): (FIGURE 1001-9)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument transformers shall be located 36 in. minimum to 66 in. maximum above final grade.
4. Requires bar type CTs for outer phases.
5. For three-phase floating (ungrounded) delta, the center position will be a solid link.
6. Refer to **ASM Section 400** for availability.

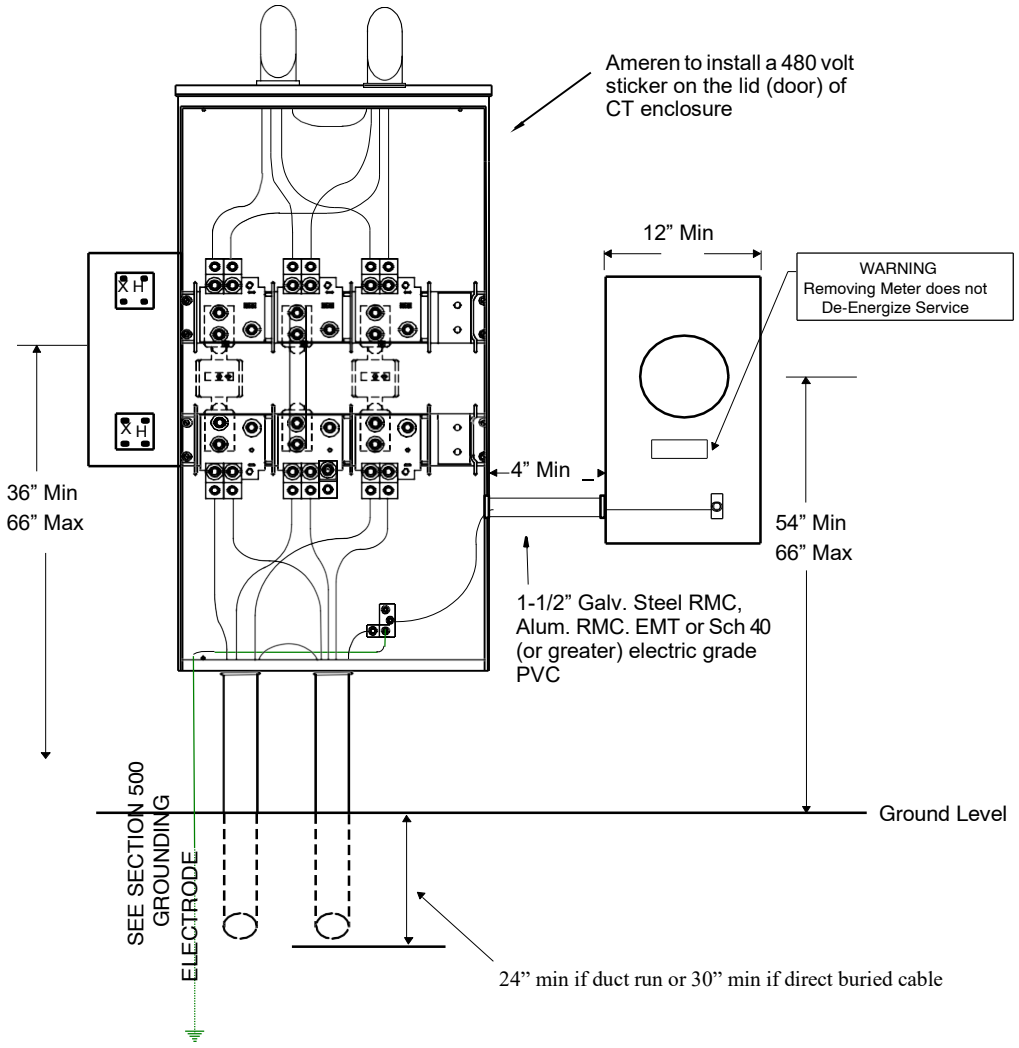
480 VOLTS, 3-PHASE, 3-WIRE CORNER GROUNDED DELTA (NON-STANDARD, SEE NOTE 6) 201 - 600 AMPERES Figure 1001-10



CONSTRUCTION NOTE(s): (FIGURE 1001-10)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. maximum above final grade.
4. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
5. For three-phase corner grounded delta, the center position will be a solid link and grounded "B" phase.
6. Refer to **ASM Section 400** for availability.

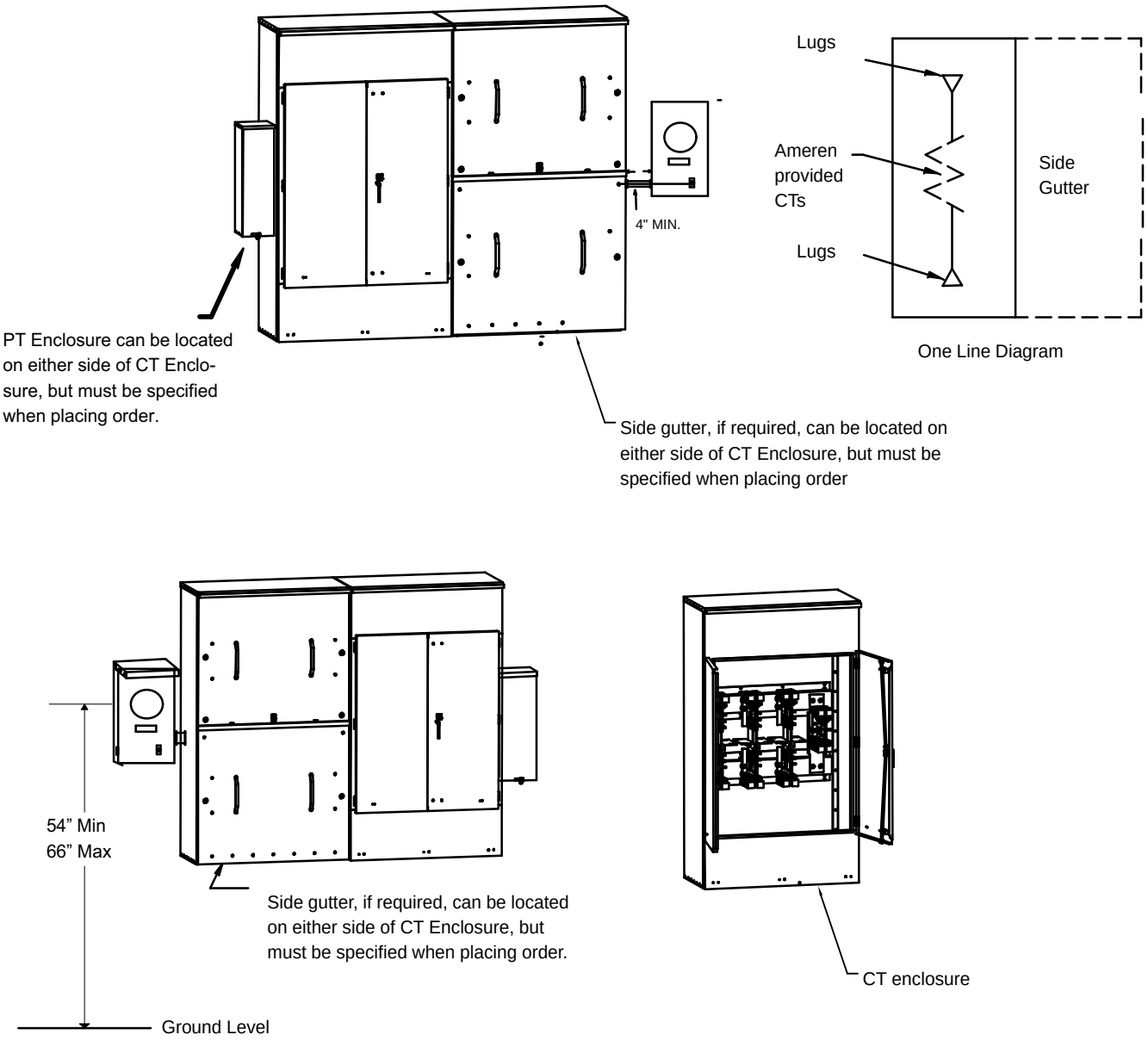
480 VOLTS, 3-PHASE, 3-WIRE FLOATING (UNGROUNDED) DELTA 401 - 600 AMPERES (NON-STANDARD, SEE NOTE 6)
Figure 1001-11



CONSTRUCTION NOTE(s): (FIGURE 1001-11)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. maximum above final grade.
4. For service riser conduits, refer to **ASM Section 700.03 (A) (2)**.
5. For three phase floating (ungrounded) delta, the center position will be a solid link.
6. Refer to **ASM Section 400** for availability.

CT Enclosure - Side Gutter
Figure 1001-12



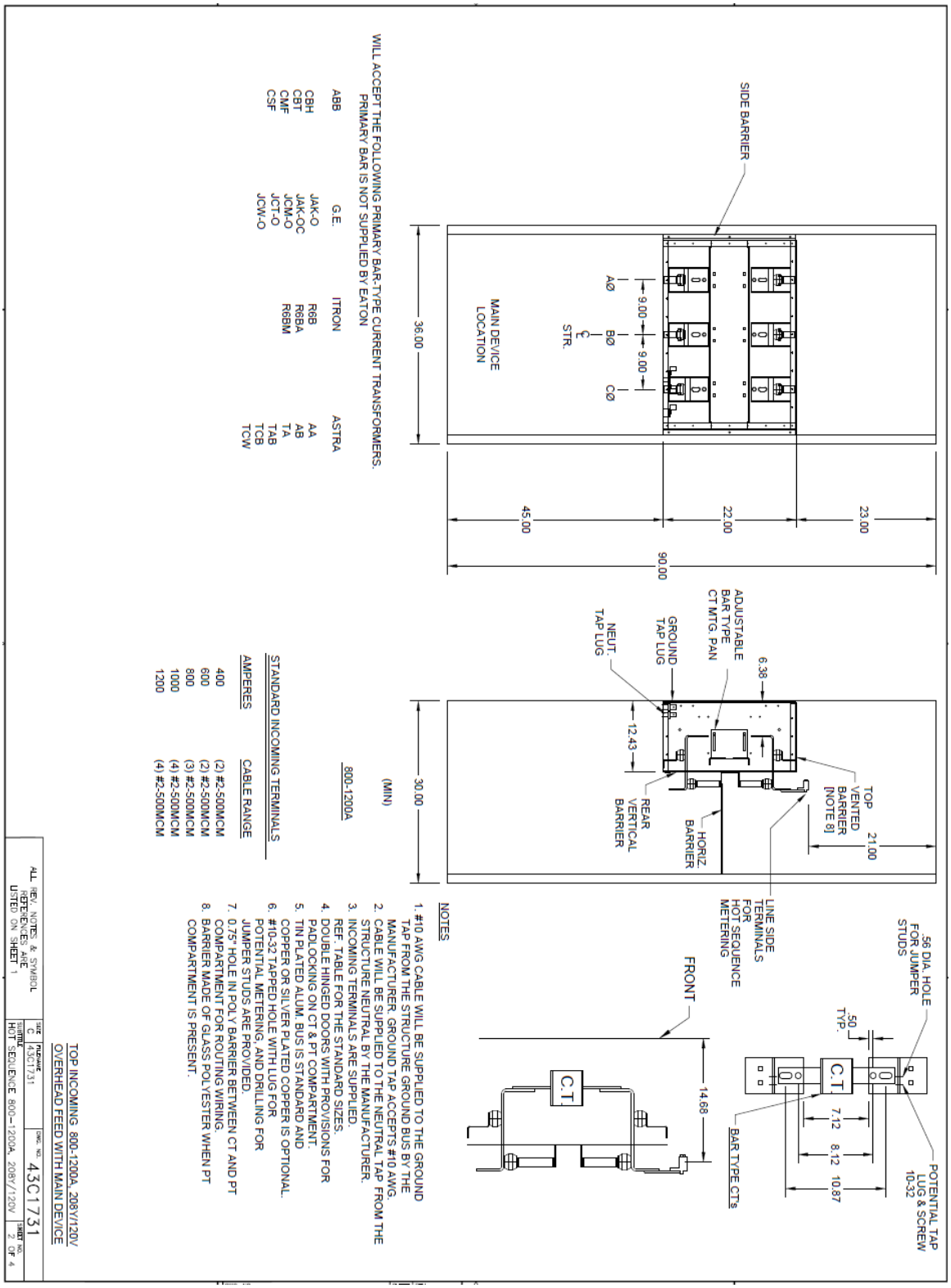
CONSTRUCTION NOTE(s): (FIGURE 1001-12)

1. Refer to **ASM Section 1001.04** for detailed meter socket requirements.
2. Refer to **ASM Section 200.02** for indoor metering criteria. Indoor CT installations require prior approval by the Field Metering Supervisor and Field Supervising Engineer.
3. Instrument Transformers shall be located 36 in. minimum to 66 in. Maximum above final grade.

AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT COMPARTMENT 208Y/120V, 800 - 1200A OVERHEAD FEED

Reference: Eaton #43C1731 (Sheet 2 of 4)

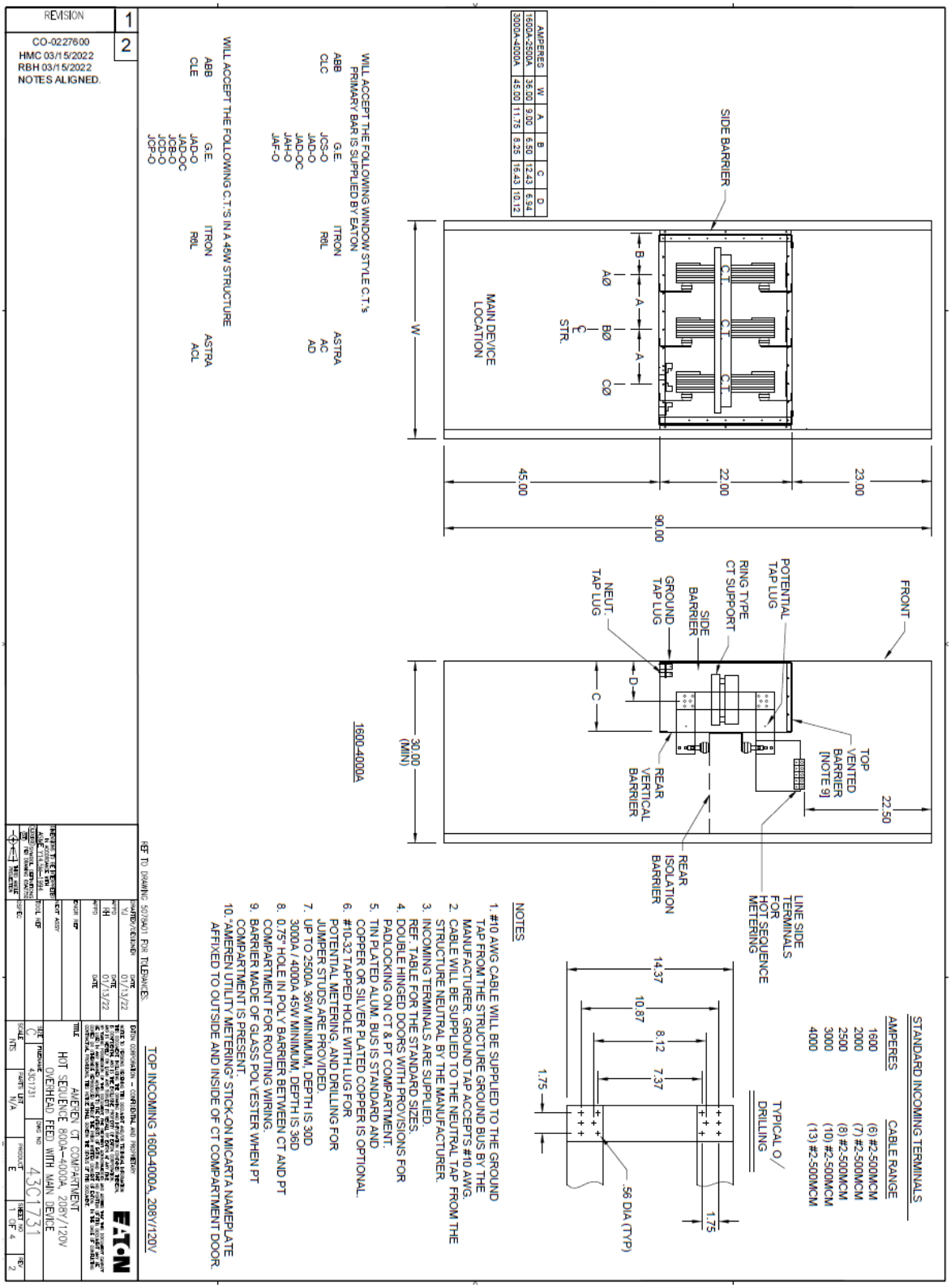
Figure 1001-1A (Sheet 2 of 4)



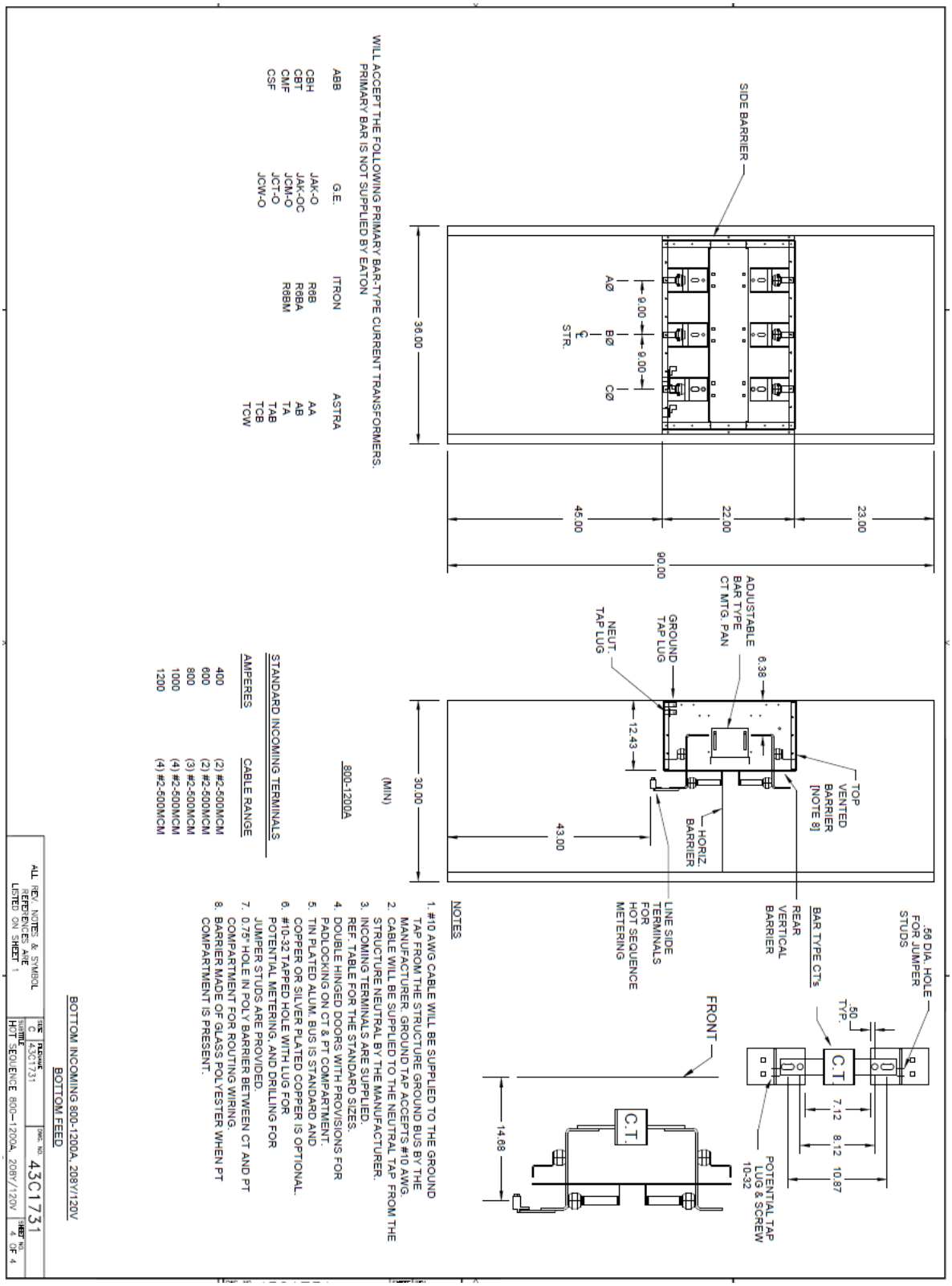
AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT COMPARTMENT 208Y/120V, 800 - 1200A OVERHEAD FEED

Reference: Eaton #43C1731 (Sheet 1 of 4)

Figure 1001-1A (Sheet 1 of 4)



AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT COMPARTMENT
208Y/120V, 800 - 1200A UNDERGROUND FEED
Reference: Eaton #43C1731 (Sheet 4 of 4)
Figure 1001-1A (Sheet 4 of 4)

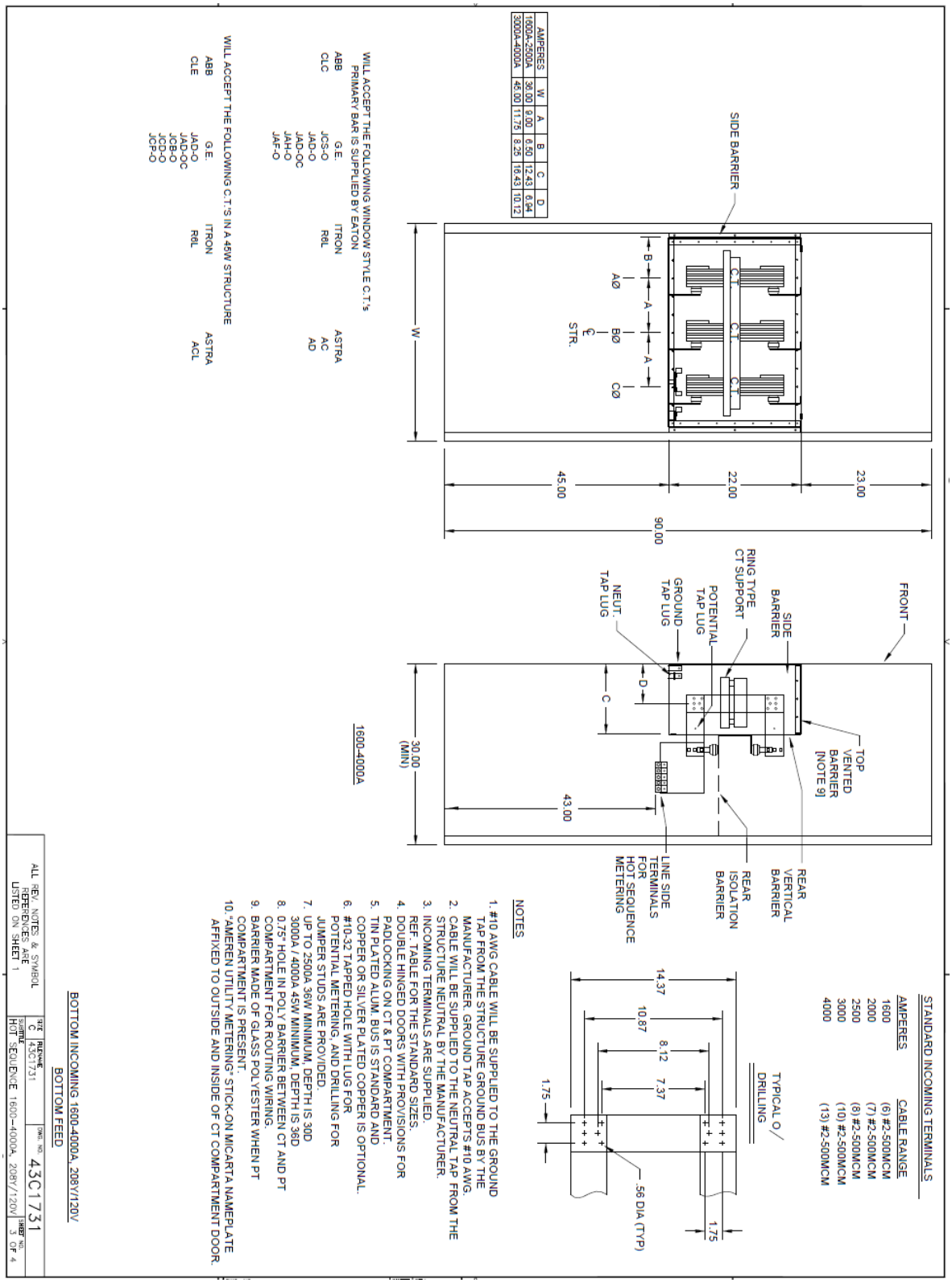


AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT COMPARTMENT

208Y/120V, 1201 - 4000A UNDERGROUND FEED

Reference: Eaton #43C1731 (Sheet 3 of 4)

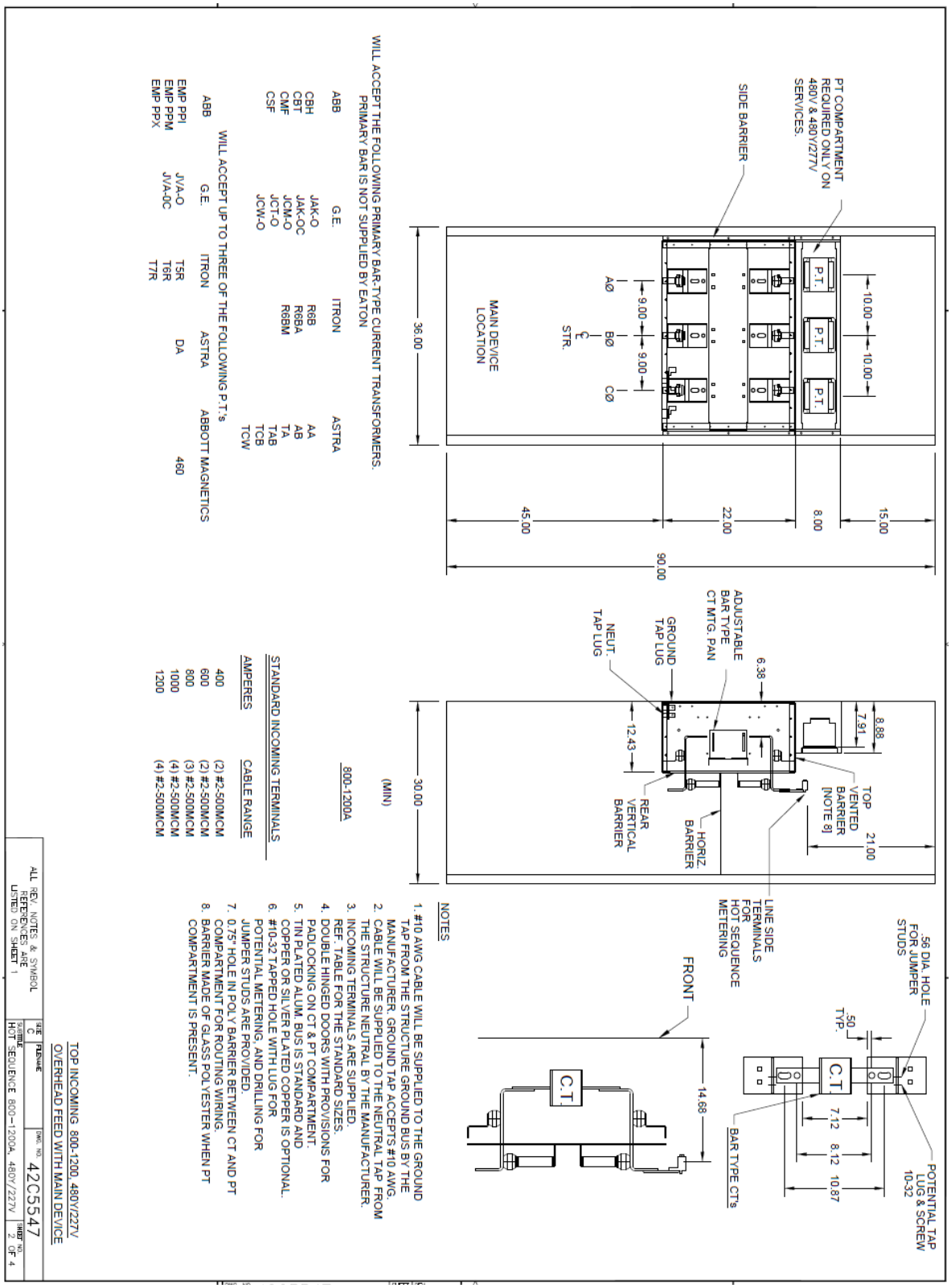
Figure 1001-1A (Sheet 3 of 4)



AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT / PT COMPARTMENT 480Y/277V, 800 - 1200A OVERHEAD FEED

Reference: Eaton #42C5547 (Sheet 2 of 4)

Figure 1001-1B (Sheet 2 of 4)



WILL ACCEPT THE FOLLOWING PRIMARY BAR-TYPE CURRENT TRANSFORMERS. PRIMARY BAR IS NOT SUPPLIED BY EATON

ABB	G.E.	ITRON	ASTRA
CBH	JAK-O	R6B	AA
CBT	JAK-OC	R6BA	AB
CMF	JCM-O	R6BM	TA
CSF	JCT-O		TAB
	JCW-O		TCB
			TCW

WILL ACCEPT UP TO THREE OF THE FOLLOWING P.T.'s

ABB	G.E.	ITRON	ASTRA	ABBOTT MAGNETICS
EMP PPI	JVA-O	T5R	DA	460
EMP PPM	JVA-0C	T6R		
EMP PPX		T7R		

800-1200A (MIN)

STANDARD INCOMING TERMINALS

AMPERES	CABLE RANGE
400	(2) #2-500MCM
600	(2) #2-500MCM
800	(3) #2-500MCM
1000	(4) #2-500MCM
1200	(4) #2-500MCM

NOTES

1. #10 AWG CABLE WILL BE SUPPLIED TO THE GROUND TAP FROM THE STRUCTURE GROUND BUS BY THE MANUFACTURER. GROUND TAP ACCEPTS #10 AWG.
2. CABLE WILL BE SUPPLIED TO THE NEUTRAL TAP FROM THE STRUCTURE NEUTRAL BY THE MANUFACTURER.
3. INCOMING TERMINALS ARE SUPPLIED. REF. TABLE FOR THE STANDARD SIZES.
4. DOUBLE HINGED DOORS WITH PROVISIONS FOR PADLOCKING ON CT & PT COMPARTMENT.
5. TIN PLATED ALUM. BUS IS STANDARD AND COPPER OR SILVER PLATED COPPER IS OPTIONAL.
6. #10-32 TAPPED HOLE WITH LUG FOR POTENTIAL METERING, AND DRILLING FOR JUMPER STUDS ARE PROVIDED.
7. 0.75" HOLE IN POLY BARRIER BETWEEN CT AND PT COMPARTMENT FOR ROUTING WIRING.
8. BARRIER MADE OF GLASS POLYESTER WHEN PT COMPARTMENT IS PRESENT.

TOP INCOMING 800-1200, 480Y/227V
OVERHEAD FEED WITH MAIN DEVICE

ALL REV. NOTES & SYMBOL REFERENCES ARE LISTED ON SHEET 1

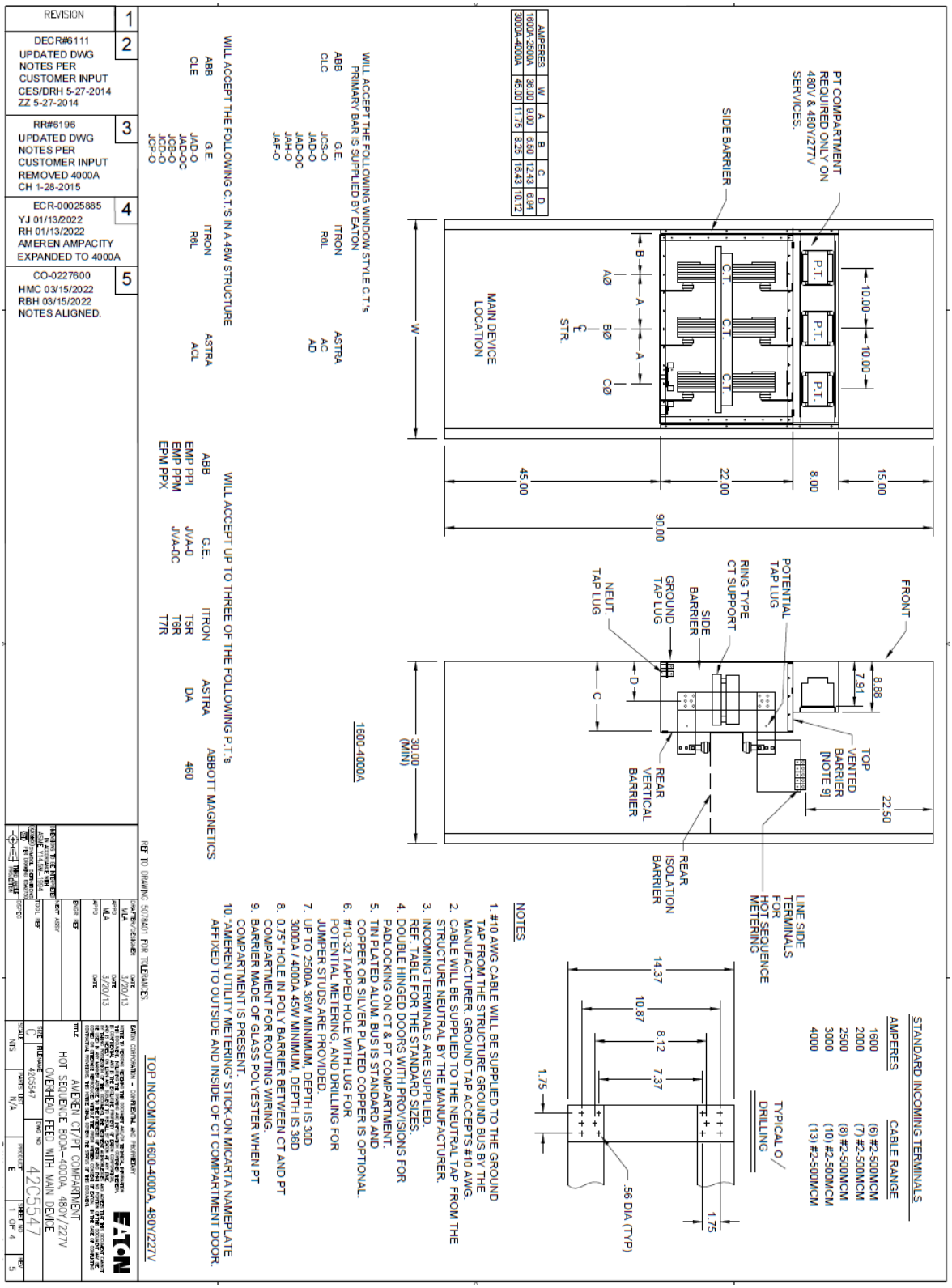
SIZE C | FSCM NAME | DWG. NO. 42C5547 | SCALE NONE | SHEET 2 OF 4

HOT SEQUENCE 800-1200A, 480Y/227V

AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT / PT COMPARTMENT 480Y/277V, 1201 - 4000A OVERHEAD FEED

Reference: Eaton #42C5547 (Sheet 1 of 4)

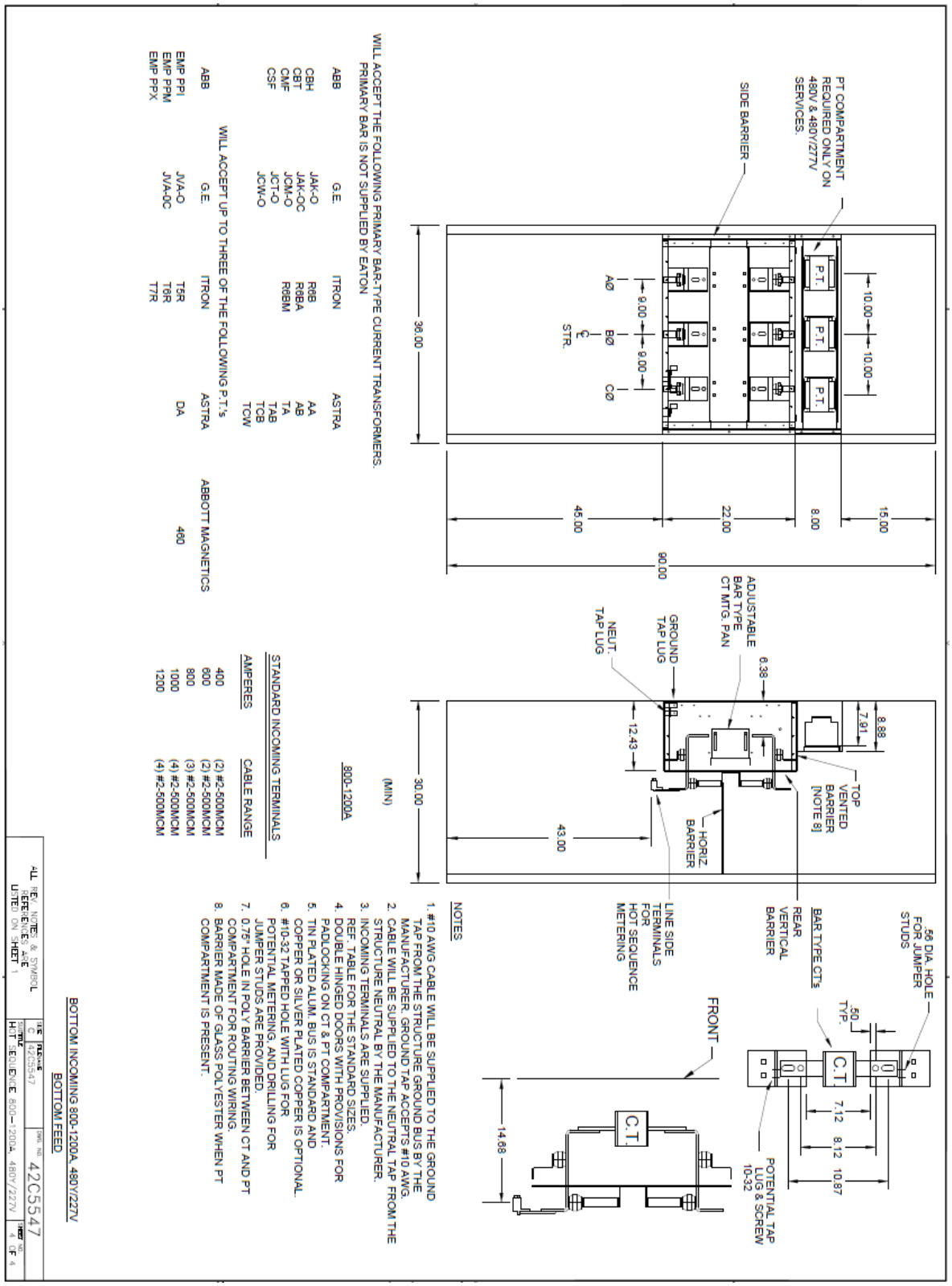
Figure 1001-1B (Sheet 1 of 4)



AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT / PT COMPARTMENT 480Y/277V, 800 - 1200A UNDERGROUND FEED

Reference: Eaton #42C5547 (Sheet 4 of 4)

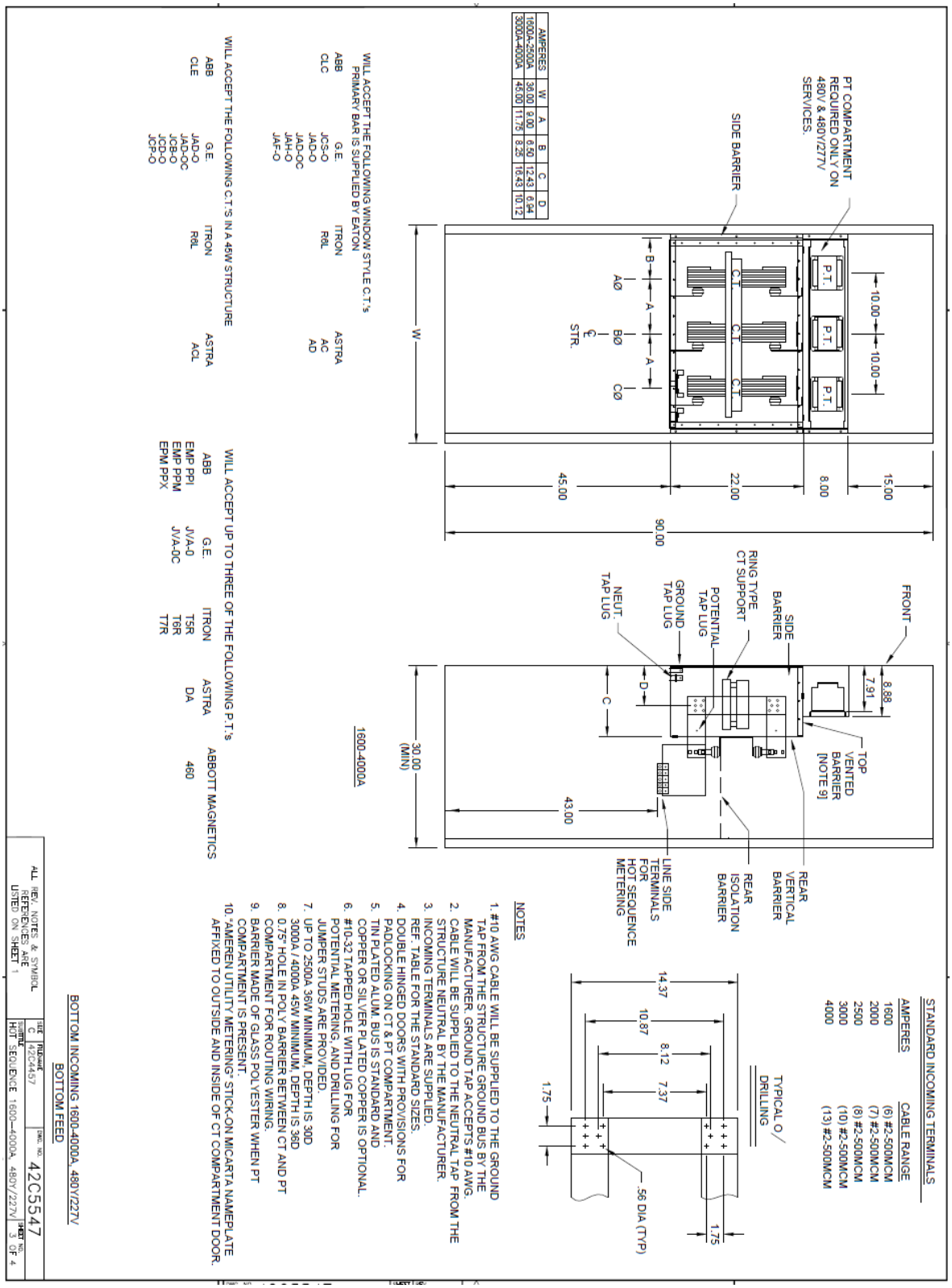
Figure 1001-1B (Sheet 4 of 4)



AMEREN APPROVED SWITCHBOARD – EATON / CUTLER HAMMER CT / PT COMPARTMENT 480Y/277V, 1201 - 4000A UNDERGROUND FEED

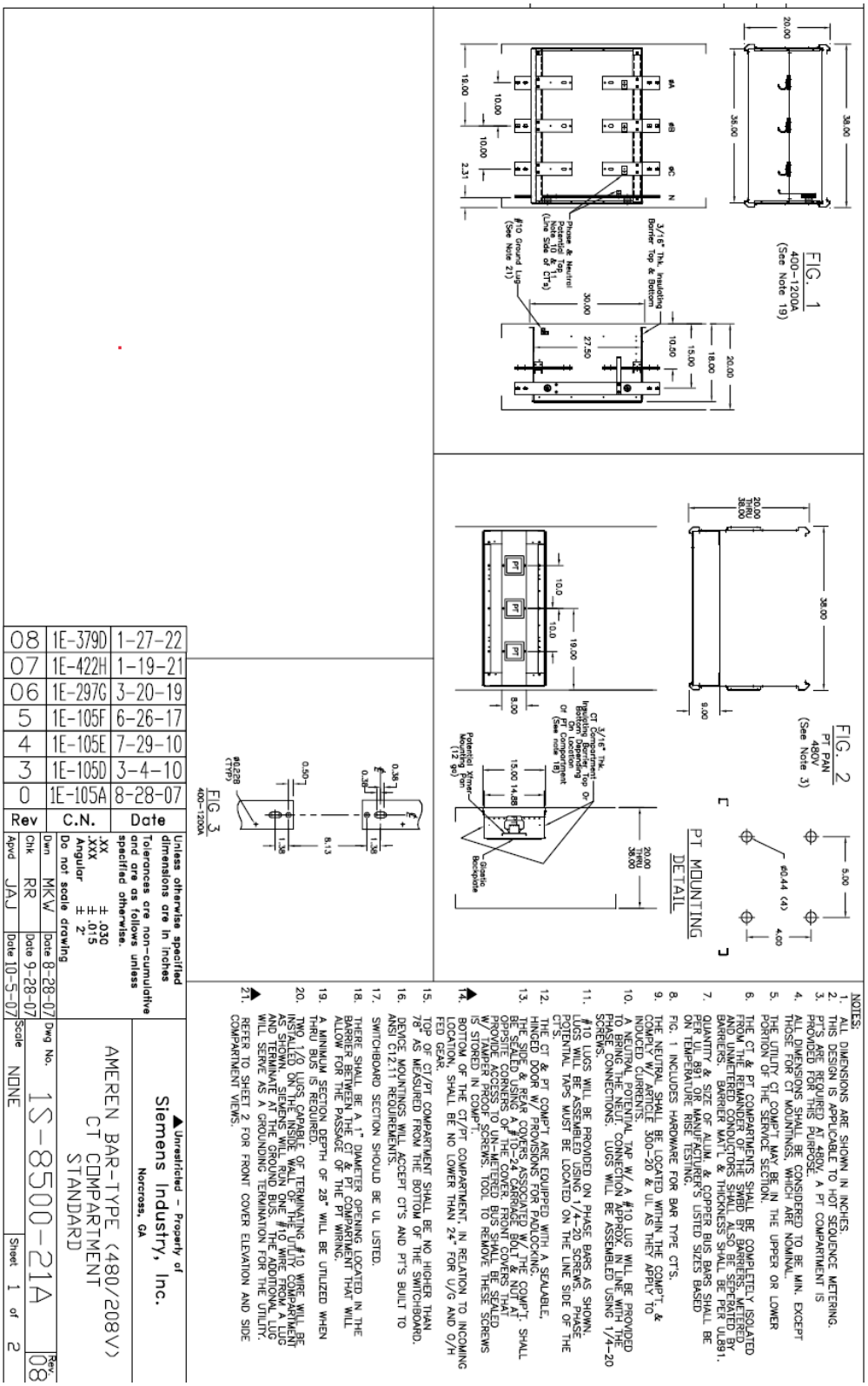
Reference: Eaton #42C5547 (Sheet 3 of 4)

Figure 1001-1B (Sheet 3 of 4)



AMEREN APPROVED SWITCHBOARD - SIEMENS CT / PT COMPARTMENT 208Y/120V; 480Y/277V, 800 - 1200 AMPERES

Reference: Siemens # 1S-8500-21A (Sheet 1 of 2)
Figure 1001-2A (Sheet 1 of 2)



Rev	C.N.	Date
08	1E-379D	1-27-22
07	1E-422H	1-19-21
06	1E-297G	3-20-19
5	1E-105F	6-26-17
4	1E-105E	7-29-10
3	1E-105D	3-4-10
0	1E-105A	8-28-07

Unless otherwise specified dimensions are in inches
Tolerances are non-cumulative and are as follows unless specified otherwise.
XX ±.030
XXX ±.015
Angular ± 2°
Do not scale drawing

Dwn MKW Date 8-28-07
Chk RR Date 9-28-07
Apvd JAJ Date 10-5-07

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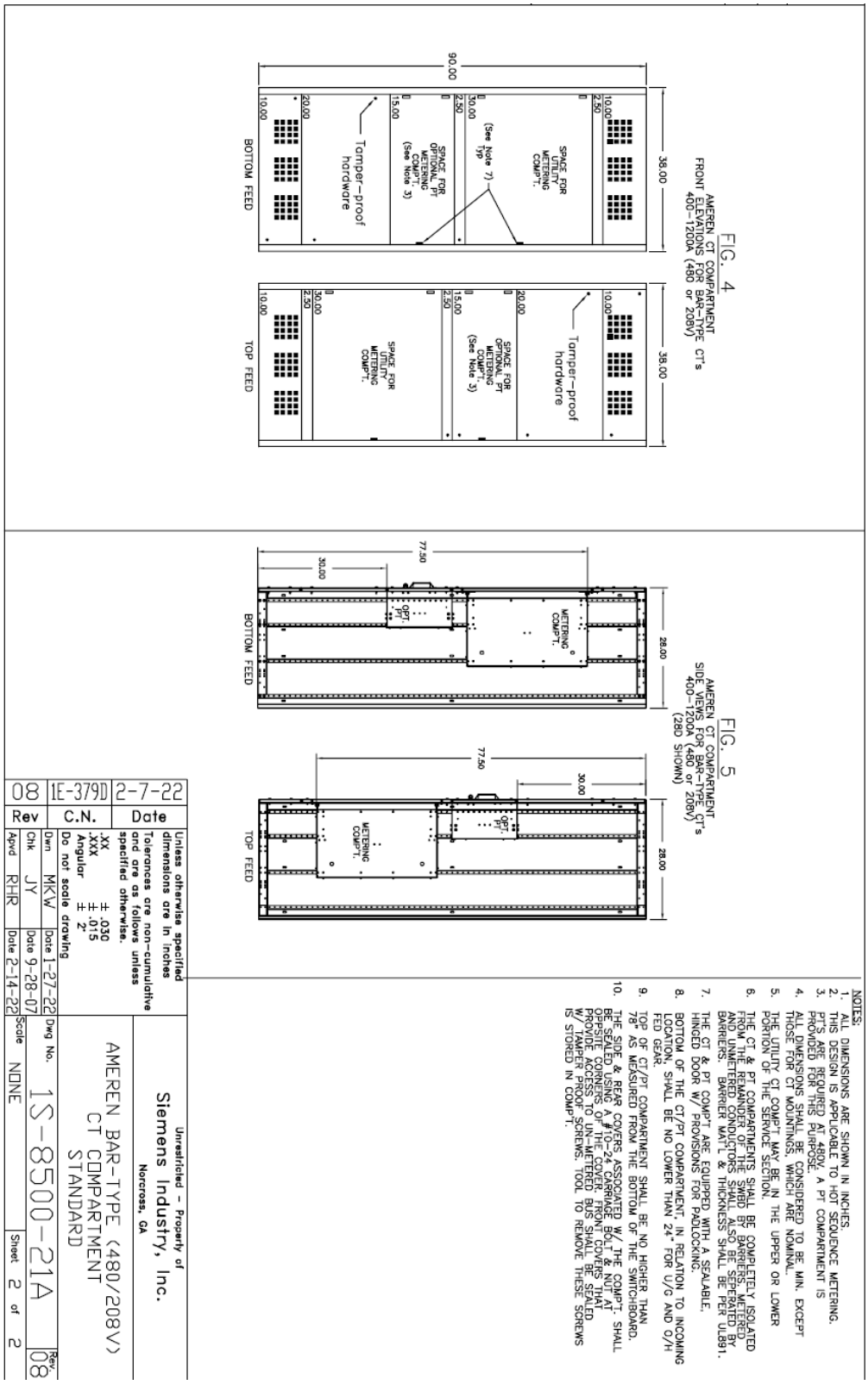
Siemens Industry, Inc.
Norcross, GA

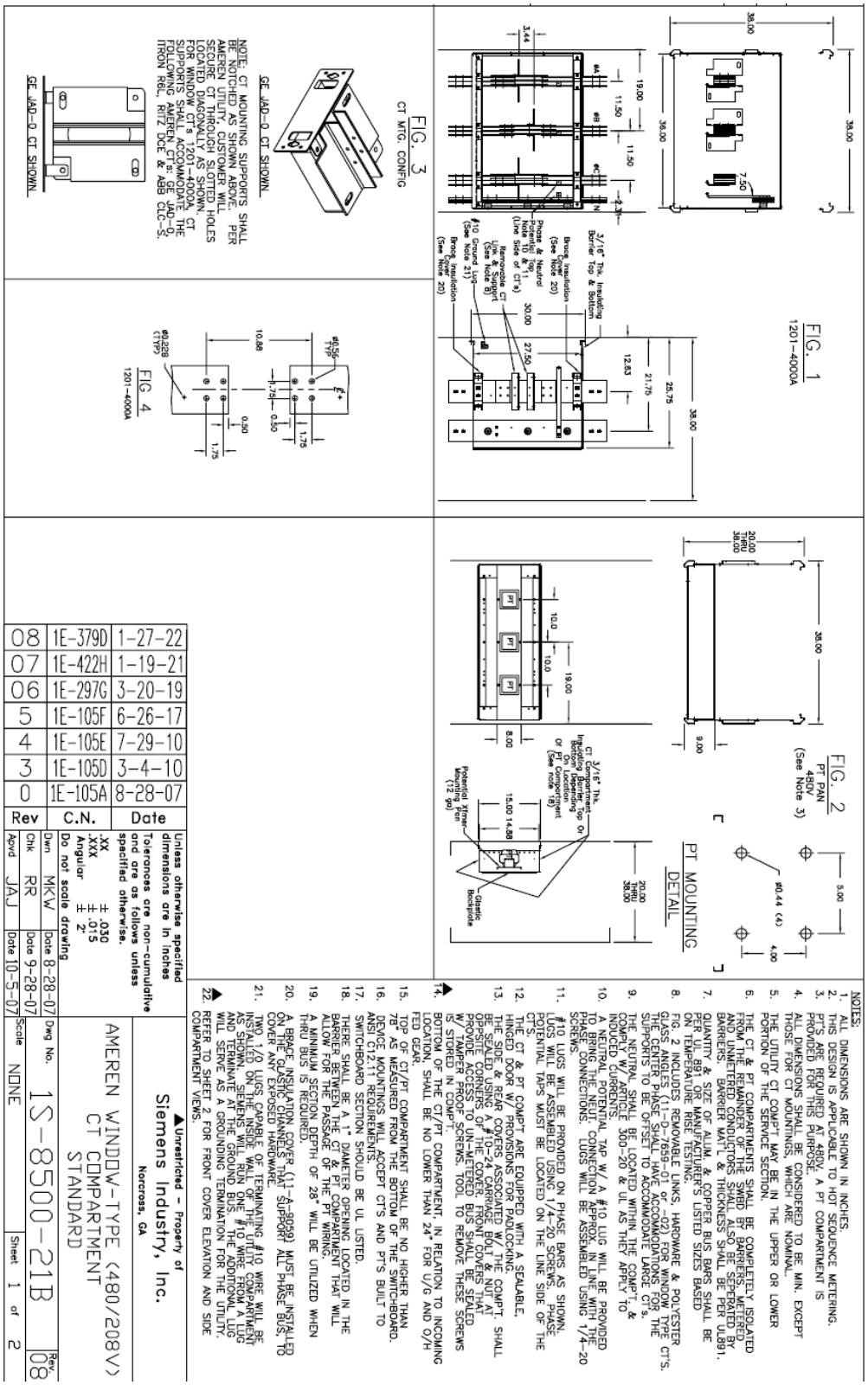
AMEREN BAR-TYPE (480/208V) CT COMPARTMENT STANDARD

Dwg No. 1S-8500-21A Rev. 08
Scale NONE Sheet 1 of 2

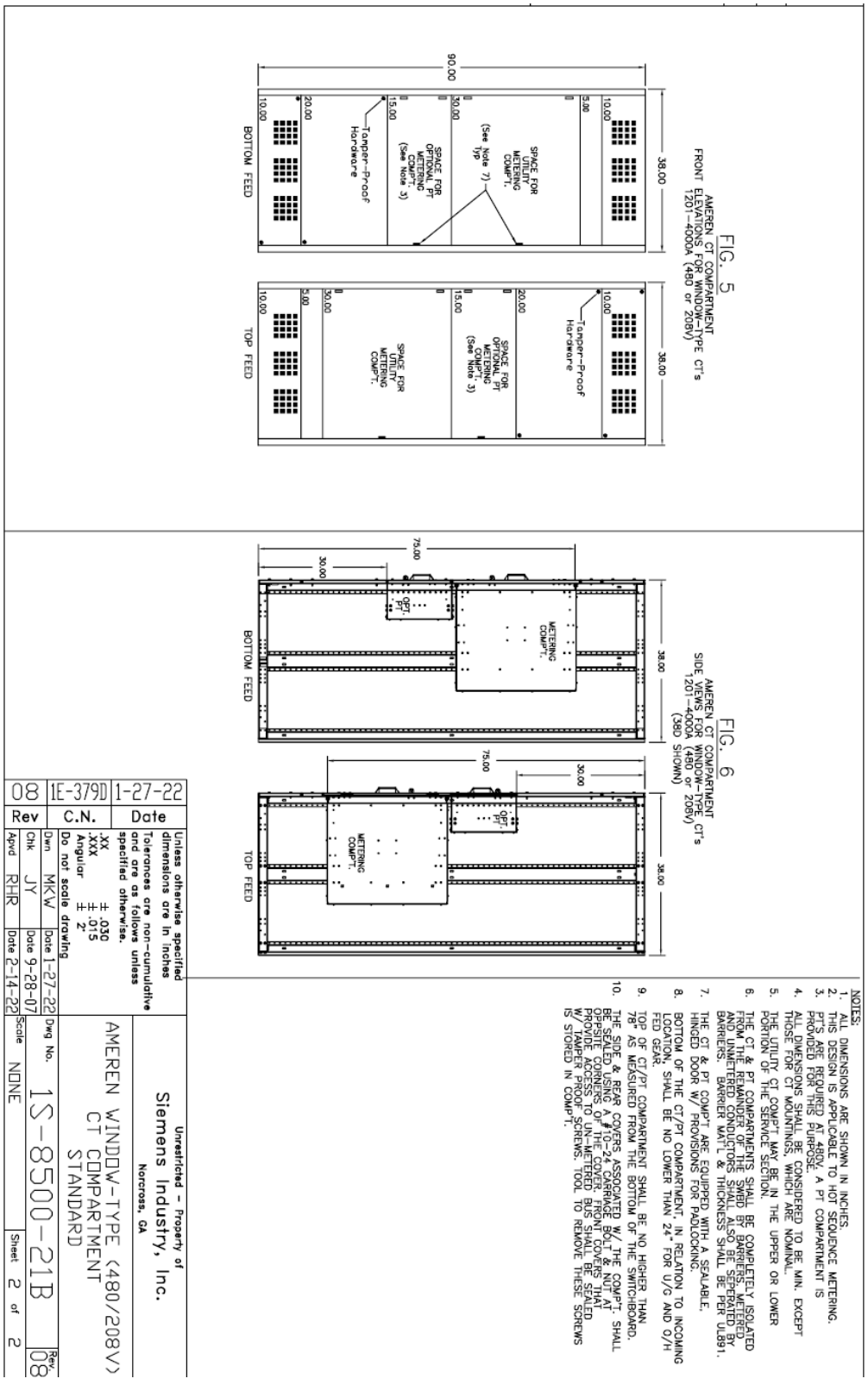
AMEREN APPROVED SWITCHBOARD - SIEMENS CT / PT COMPARTMENT
208Y/120V; 480Y/277V, 800 - 1200 AMPERES
Reference: Siemens # 1S-8500-21A (Sheet 2 of 2)
Figure 1001-2A (Sheet 2 of 2)



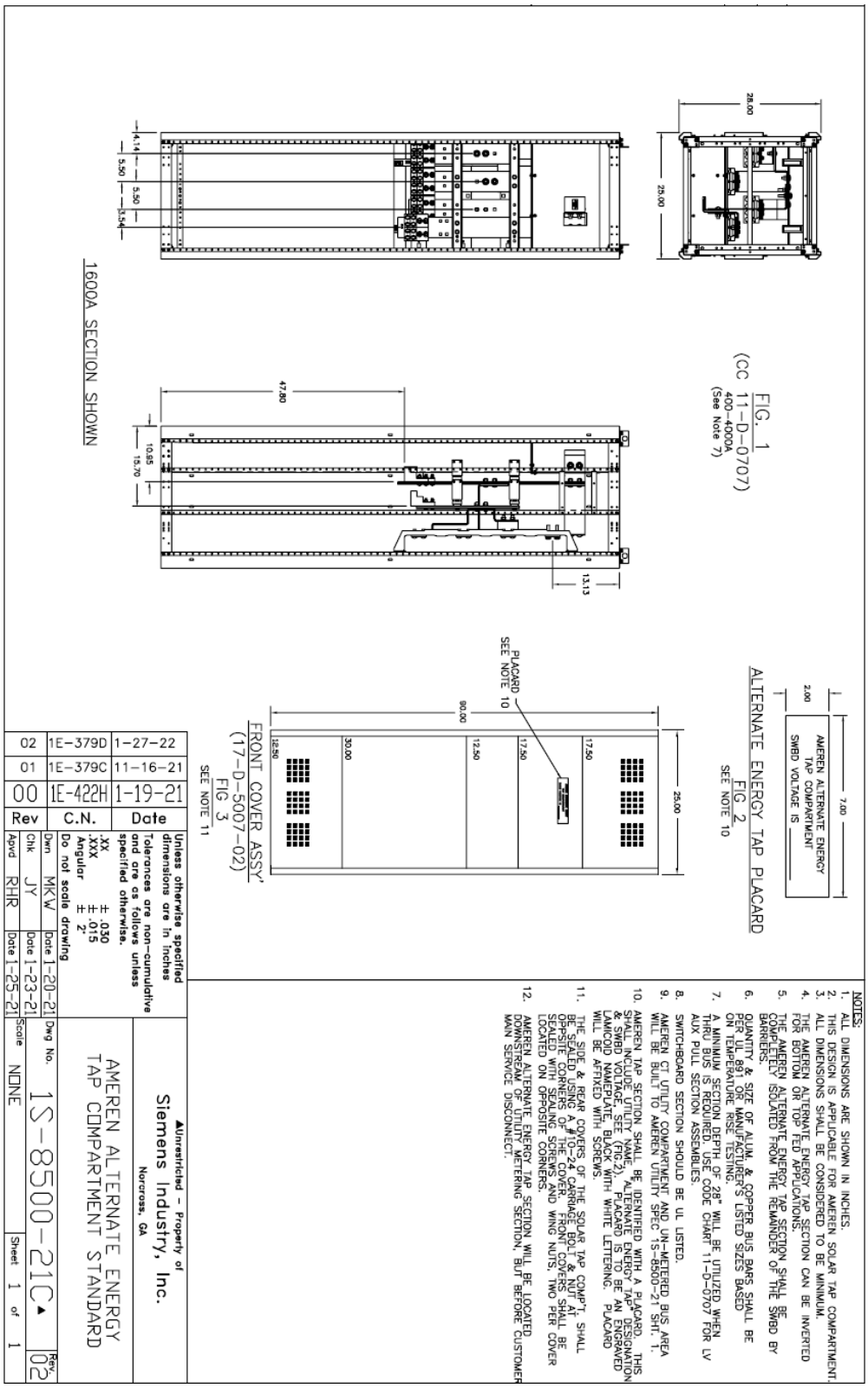
AMEREN APPROVED SWITCHBOARD - SIEMENS CT / PT COMPARTMENT
208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
Reference: Siemens # 1S-8500-21B (Sheet 1 of 2)
Figure 1001-2B (Sheet 1 of 2)



AMEREN APPROVED SWITCHBOARD - SIEMENS CT / PT COMPARTMENT
208Y/120V; 480Y/277V, 1201 - 4000 AMPERES
Reference: Siemens # 1S-8500-21B (Sheet 2 of 2)
Figure 1001-2B (Sheet 2 of 2)



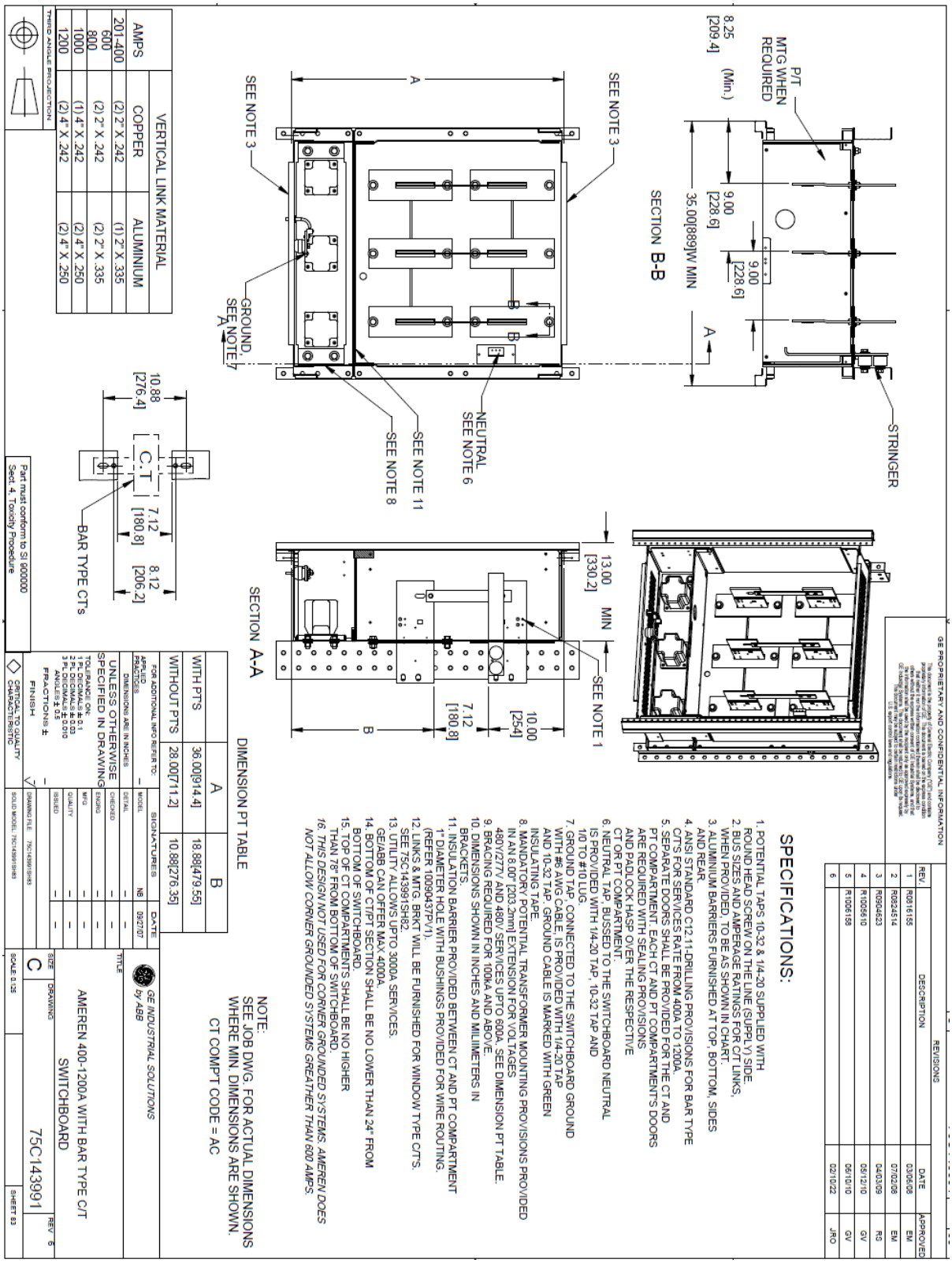
AMEREN APPROVED SWITCHBOARD - SIEMENS CT / PT COMPARTMENT
208Y/120V; 480Y/277V, 4000 AMPERES MAX - Alternate Energy Tap Compartment
Reference: Siemens 1S-8500-21C
Figure 1001-2C



AMEREN APPROVED SWITCHBOARD – ABB / GE CT / PT COMPARTMENT 208Y/120V; 480Y/277V, 800 - 1200 AMPERES

Reference: ABB / GE 75C143991 (Sheet 83)

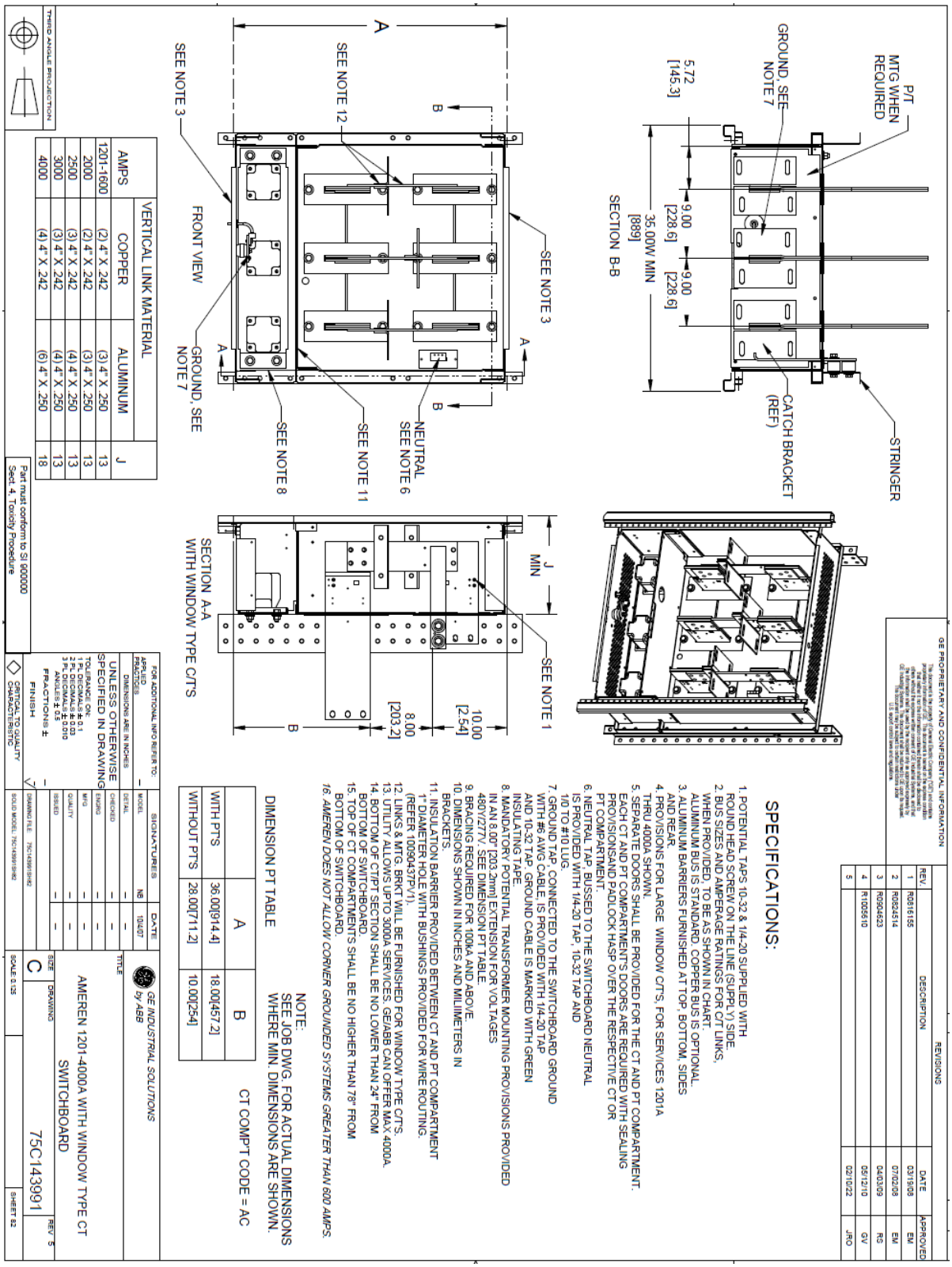
Figure 1001-3A (Sheet 83)



AMEREN APPROVED SWITCHBOARD – ABB / GE CT / PT COMPARTMENT 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES

Reference: ABB / GE #75C143991 (Sheet 82)

Figure 1001-3B (Sheet 82)



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
1	R0816155	0311908	EM
2	R0824514	0702208	EM
3	R0904623	0403109	RS
4	R1005610	0512110	GV
5		0210122	JRO

GE PROPRIETARY AND CONFIDENTIAL INFORMATION

SPECIFICATIONS:

1. POTENTIAL TAPS 10-32 & 1/4-20 SUPPLIED WITH ROUND HEAD SCREW ON THE LINE (SUPPLY) SIDE.
2. BUS SIZES AND AMPERAGE RATINGS FOR CT LINKS, WHEN PROVIDED, TO BE AS SHOWN IN CHART.
3. ALUMINUM BUS IS STANDARD, COPPER BUS IS OPTIONAL
4. ALUMINUM BARRIERS FURNISHED AT TOP, BOTTOM, SIDES AND REAR.
5. PROVISIONS FOR LARGE WINDOW CT'S, FOR SERVICES 1201A THRU 4000A SHOWN.
6. SEPARATE DOORS SHALL BE PROVIDED FOR THE CT AND PT COMPARTMENT. EACH CT AND PT COMPARTMENT'S DOORS ARE REQUIRED WITH SEALING PROVISIONSAND PADLOCK HASP OVER THE RESPECTIVE CT OR PT COMPARTMENT.
6. NEUTRAL TAP, BUSSED TO THE SWITCHBOARD NEUTRAL IS PROVIDED WITH 1/4-20 TAP, 10-32 TAP AND 1/0 TO #10 LUG.
7. GROUND TAP, CONNECTED TO THE SWITCHBOARD GROUND WITH #6 AWG CABLE, IS PROVIDED WITH 1/4-20 TAP AND 10-32 TAP. GROUND CABLE IS MARKED WITH GREEN INSULATING TAPE
8. MANDATORY POTENTIAL TRANSFORMER MOUNTING PROVISIONS PROVIDED IN A 8.00" [203.2mm] EXTENSION FOR VOLTAGES 480Y/277V. SEE DIMENSION PT TABLE.
9. BRACING REQUIRED FOR 100kA AND ABOVE.
10. DIMENSIONS SHOWN IN INCHES AND MILLIMETERS IN BRACKETS.
11. INSULATION BARRIER PROVIDED BETWEEN CT AND PT COMPARTMENT 1" DIAMETER HOLE WITH BUSHINGS PROVIDED FOR WIRE ROUTING. (REFER 10090437PV1).
12. LINKS & MTG. BRKT WILL BE FURNISHED FOR WINDOW TYPE CT'S.
13. UTILITY ALLOWS UPTO 3000A SERVICES. GE/ABB CAN OFFER MAX 4000A.
14. BOTTOM OF CT/PT SECTION SHALL BE NO LOWER THAN 24" FROM BOTTOM OF SWITCHBOARD.
15. TOP OF CT COMPARTMENTS SHALL BE NO HIGHER THAN 78" FROM BOTTOM OF SWITCHBOARD.
16. *AMEREN DOES NOT ALLOW CORNER GROUNDED SYSTEMS GREATER THAN 600 AMPS.*

NOTE:
SEE JOB DWG. FOR ACTUAL DIMENSIONS WHERE MIN. DIMENSIONS ARE SHOWN.

DIMENSION PT TABLE

	A	B
WITH PT'S	36.00[914.4]	18.00[457.2]
WITHOUT PT'S	28.00[711.2]	10.00[254]

CT COMPT CODE = AC

VERTICAL LINK MATERIAL			
AMPS	COPPER	ALUMINUM	J
1201-1600	(2) 4" X .242	(3) 4" X .250	13
2000	(2) 4" X .242	(3) 4" X .250	13
2500	(3) 4" X .242	(4) 4" X .250	13
3000	(3) 4" X .242	(4) 4" X .250	13
4000	(4) 4" X .242	(6) 4" X .250	18

Part must conform to SI 600000 Sect. 4, Toxicity Procedure

THIRD ANGLE PROJECTION

FOR ADDITIONAL INFO REFER TO:
APPLIED PRACTICES –
DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE SPECIFIED IN DRAWING
TOLERANCE ON:
1 PL DECIMALS ± 0.1
2 PL DECIMALS ± 0.03
3 PL DECIMALS ± 0.010
ANGLES ± 0.5
FRACTIONS ±
FINISH –
CRITICAL TO QUALITY CHARACTERISTIC

SIGNATURES

	NAME	DATE
MODEL	NB	10/4/07
DETAIL	–	–
CHECKED	–	–
ENGRG	–	–
MFG	–	–
QUALITY	–	–
ISSUED	–	–

DRAWING FILE: 75C143991SH82
SOLID MODEL: 75C143991SH82

GE INDUSTRIAL SOLUTIONS by ABB

TITLE
AMEREN 1201-4000A WITH WINDOW TYPE CT SWITCHBOARD

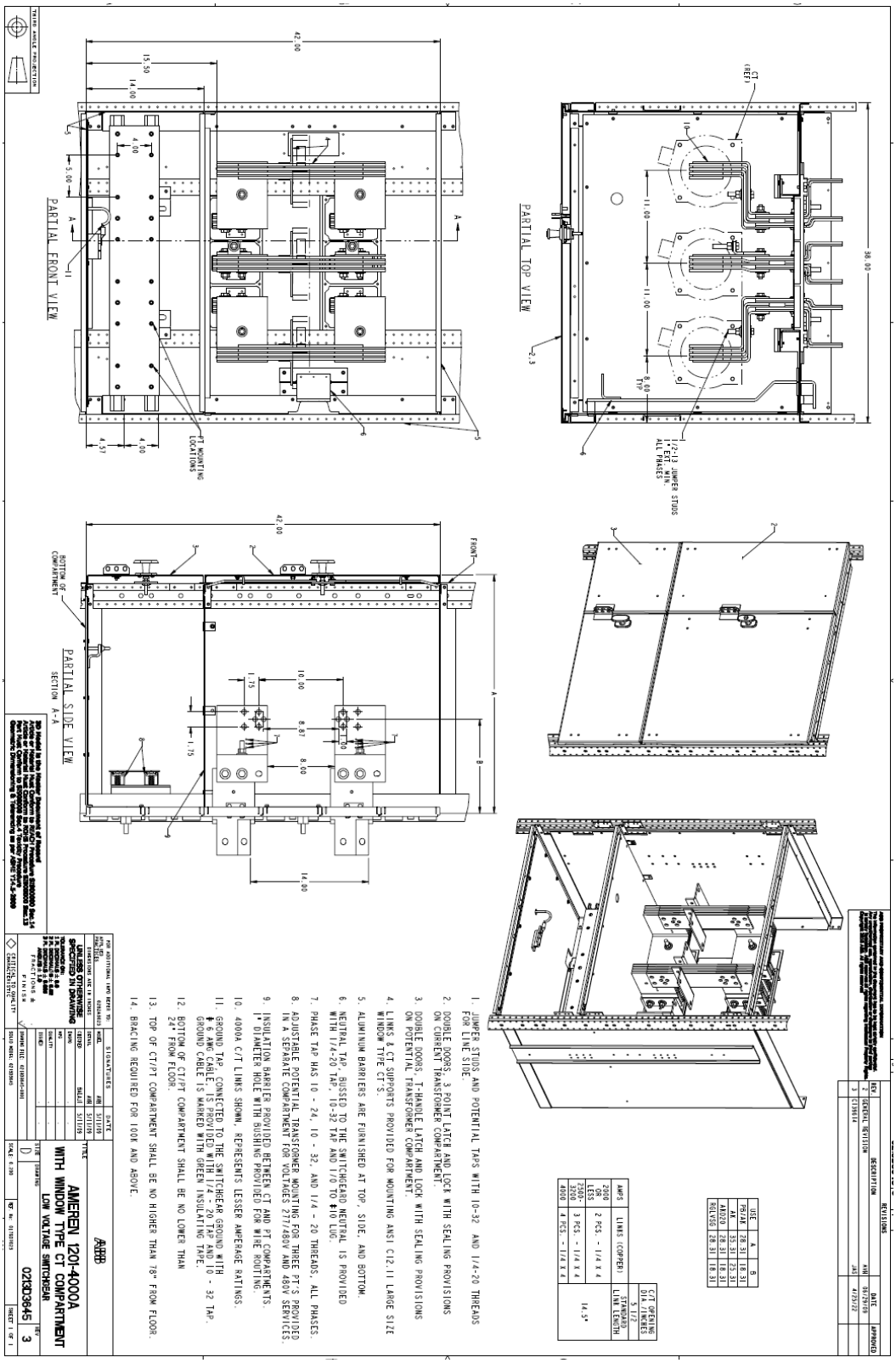
SIZE C | DRAWING 75C143991 | REV 5

SCALE: 0.125 | SHEET 82

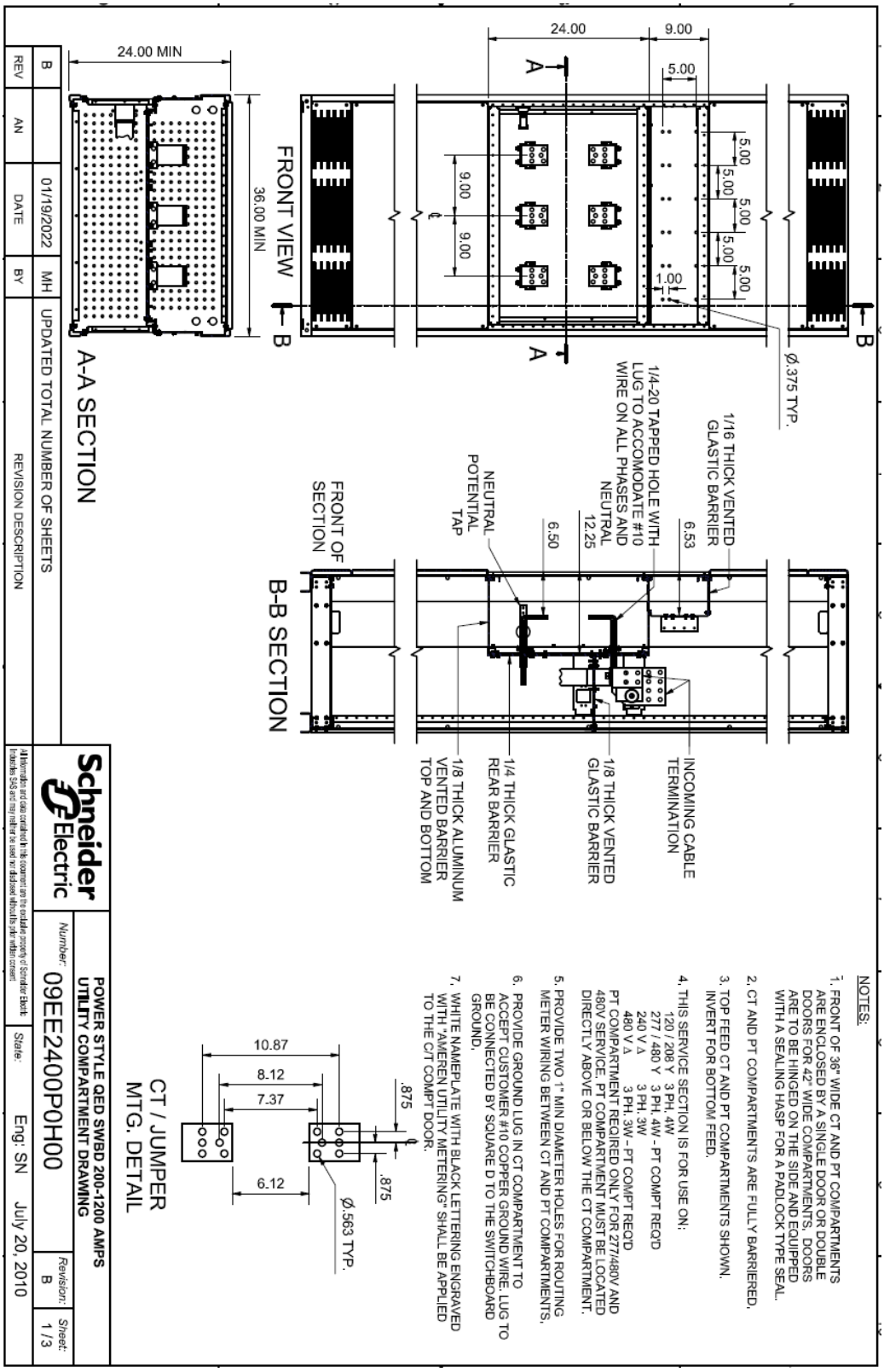
AMEREN APPROVED SWITCHBOARD – ABB / GE - CT / PT COMPARTMENT 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES - PHYSICAL DIMENSION

Reference: ABB / GE #0213D3645 (Sheet 1)

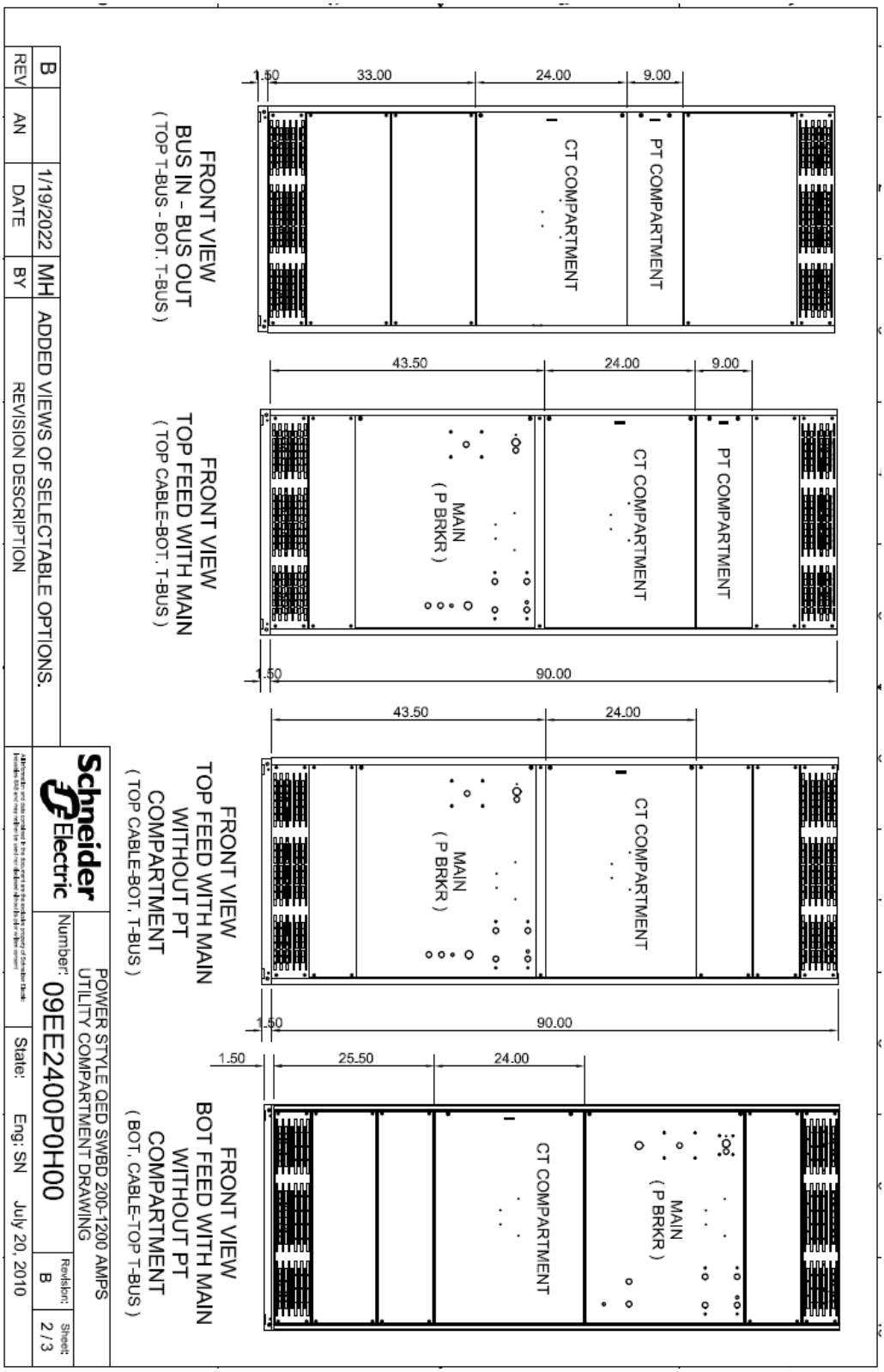
Figure 1001-3C (Sheet 1)



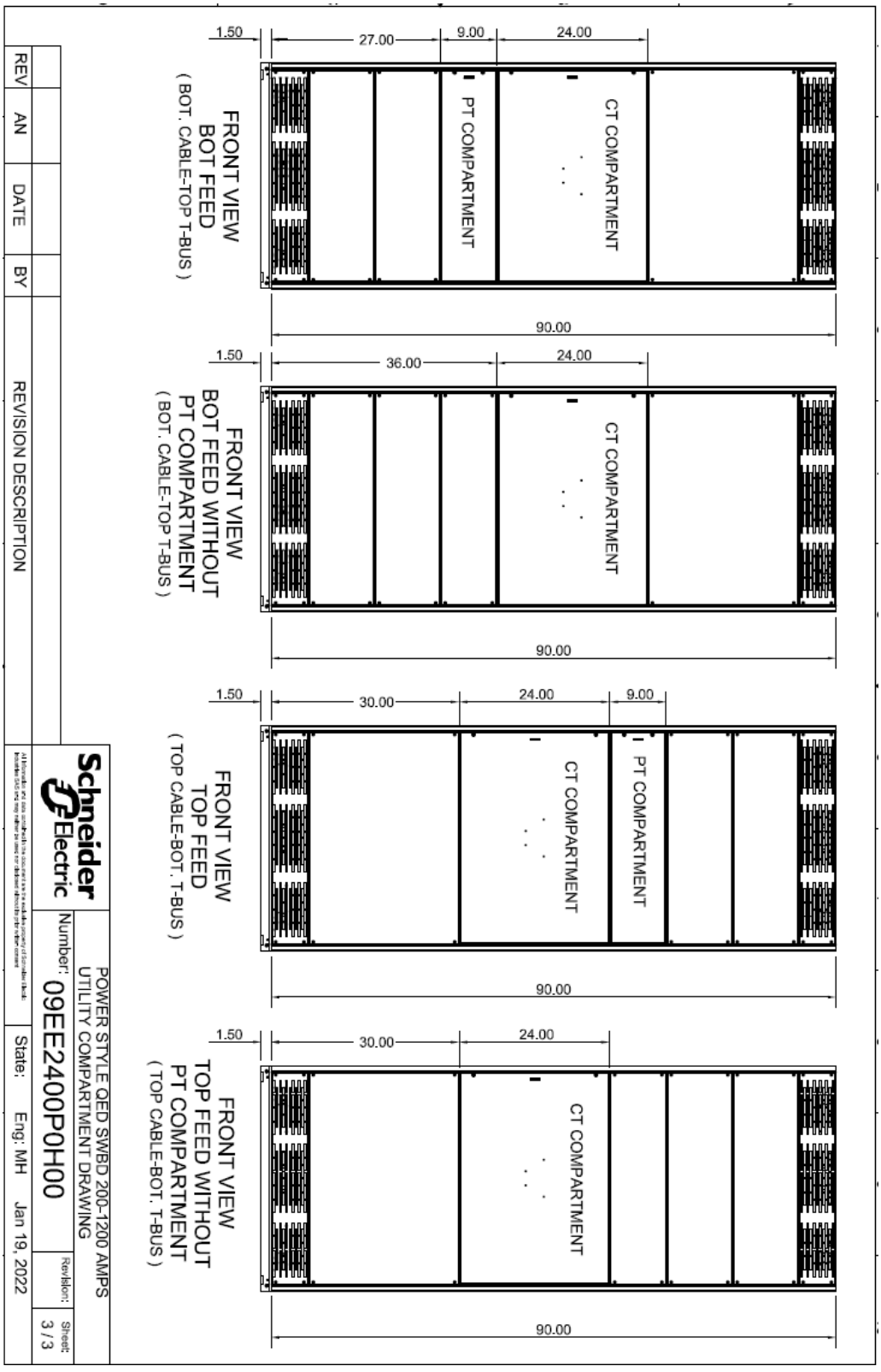
AMEREN APPROVED SWITCHBOARD - SQUARE D / SCHNEIDER
208Y/120V; 480Y/277V, 800 - 1200 AMPERES - CT / PT COMPARTMENT
Reference: Schneider #09EE2400P0H00 (Sheet 1 of 3)
Figure 1001-4A (Sheet 1 of 3)



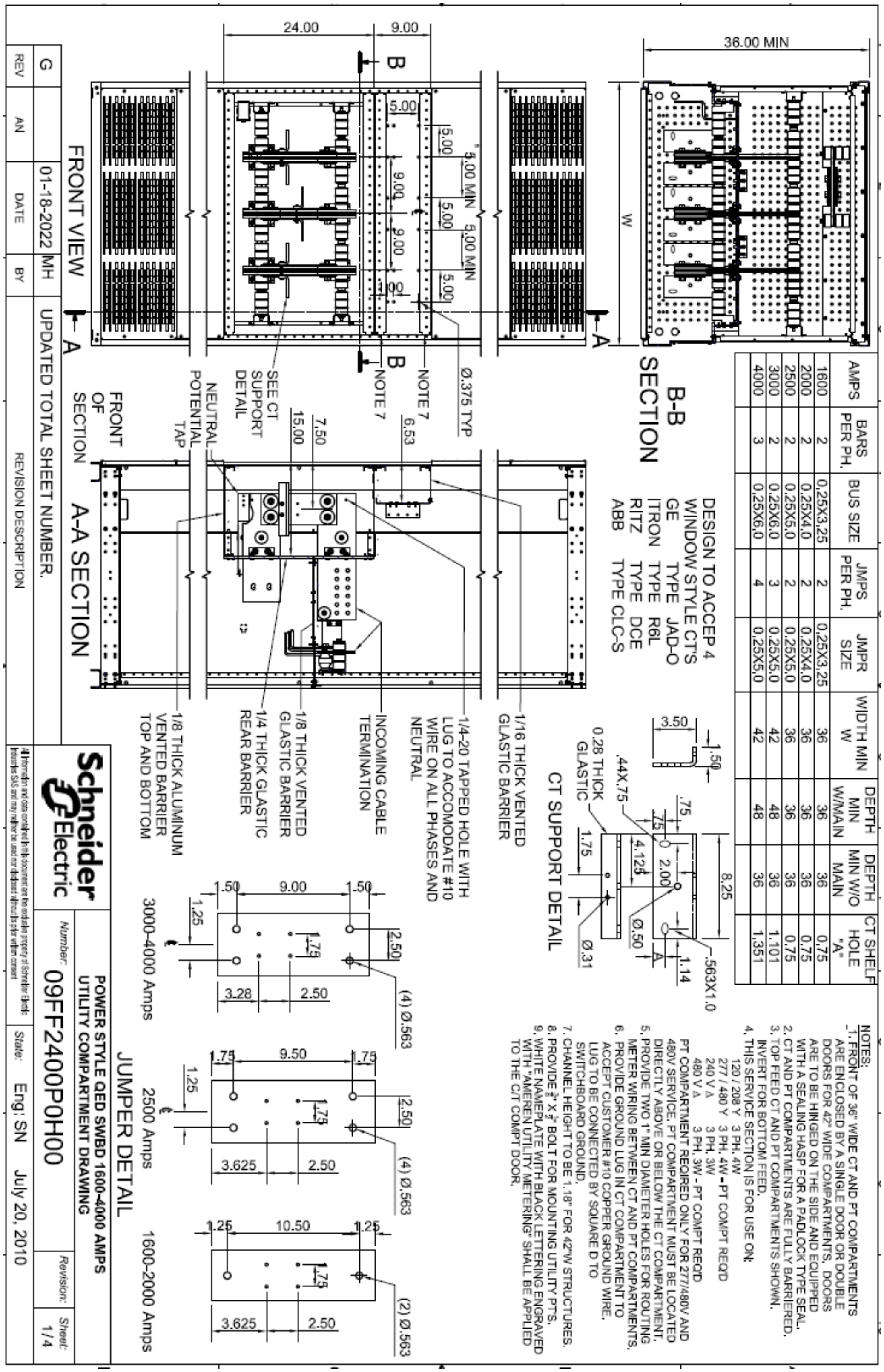
AMEREN APPROVED SWITCHBOARD - SQUARE D / SCHNEIDER
208Y/120V; 480Y/277V, 800 - 1200 AMPERES - CT / PT COMPARTMENT
Schneider #09EE2400P0H00 (Sheet 2 of 3)
Figure 1001-4A (Sheet 2 of 3)



AMEREN APPROVED SWITCHBOARD - SQUARE D / SCHNEIDER
208Y/120V; 480Y/277V, 800 - 1200 AMPERES - CT / PT COMPARTMENT
Reference: Schneider #09EE2400P0H00 (Sheet 3 of 3)
Figure 1001-4A (Sheet 3 of 3)



AMEREN APPROVED SWITCHBOARD - SQUARE D / SCHNEIDER ELECTRIC
208Y/120V; 480Y/277V, 1201 - 4000 AMPERES - CT / PT COMPARTMENT
Reference: Schneider #09FF2400P0H00 (Sheet 1 of 4)
Figure 1001-4B (Sheet 1 of 4)

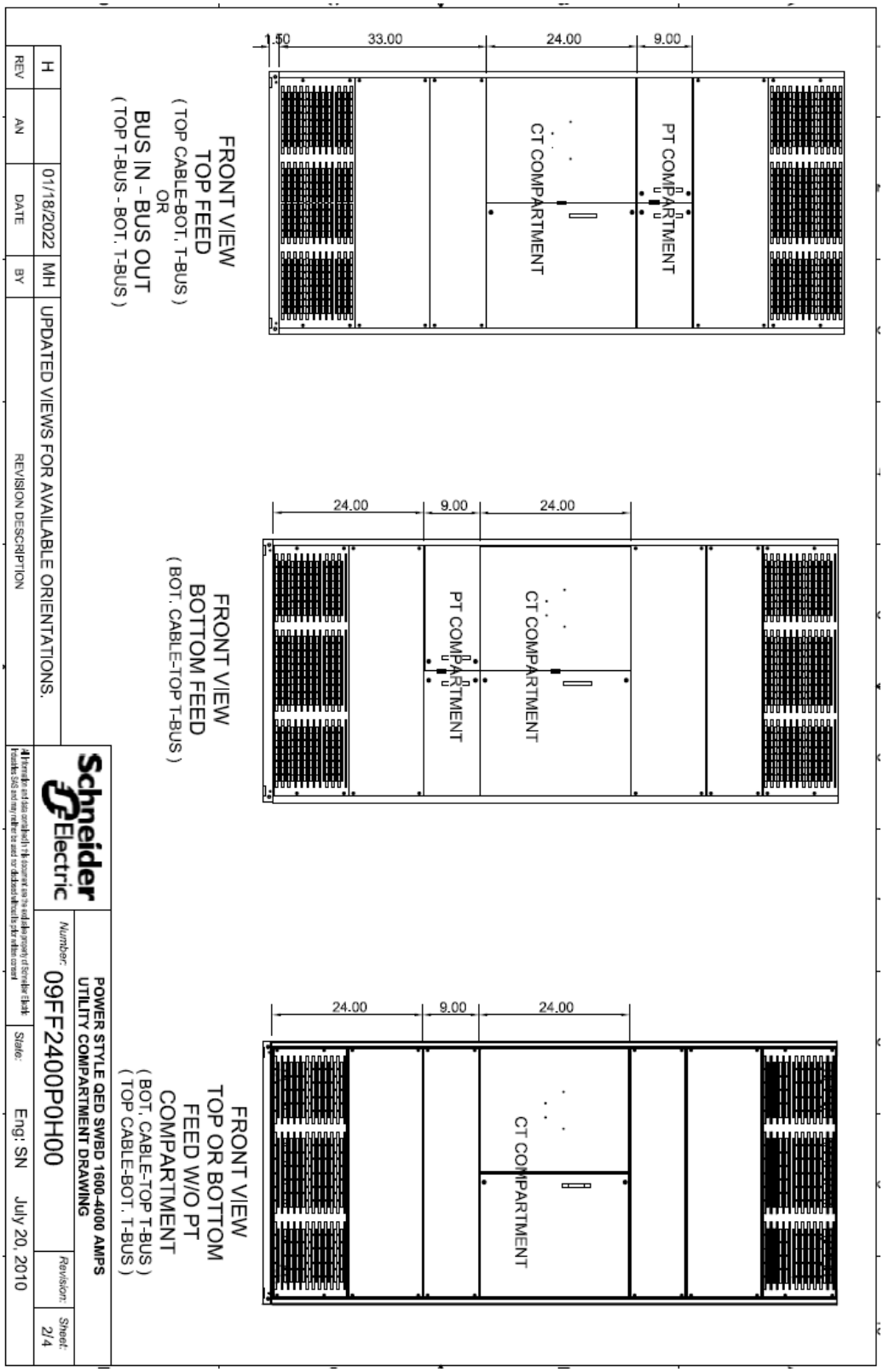


AMPS	BARS PER PH.	BUS SIZE	JMPS PER PH.	JMPR SIZE	WIDTH MIN W	DEPTH MIN W/MAIN	DEPTH MIN W/O MAIN	CT SHELF HOLE "A"
1600	2	0.25X3.25	2	0.25X3.25	36	36	36	0.75
2000	2	0.25X4.0	2	0.25X4.0	36	36	36	0.75
2500	2	0.25X5.0	2	0.25X5.0	36	36	36	0.75
3000	2	0.25X6.0	3	0.25X5.0	42	48	36	1.101
4000	3	0.25X6.0	4	0.25X5.0	42	48	36	1.351

AMEREN APPROVED SWITCHBOARD - SQUARE D / SCHNEIDER ELECTRIC 208Y/120V; 480Y/277V 1201 - 4000 AMPERES - CT / PT COMPARTMENT

Reference: Schneider #09FF2400P0H00 (Sheet 2 of 4)

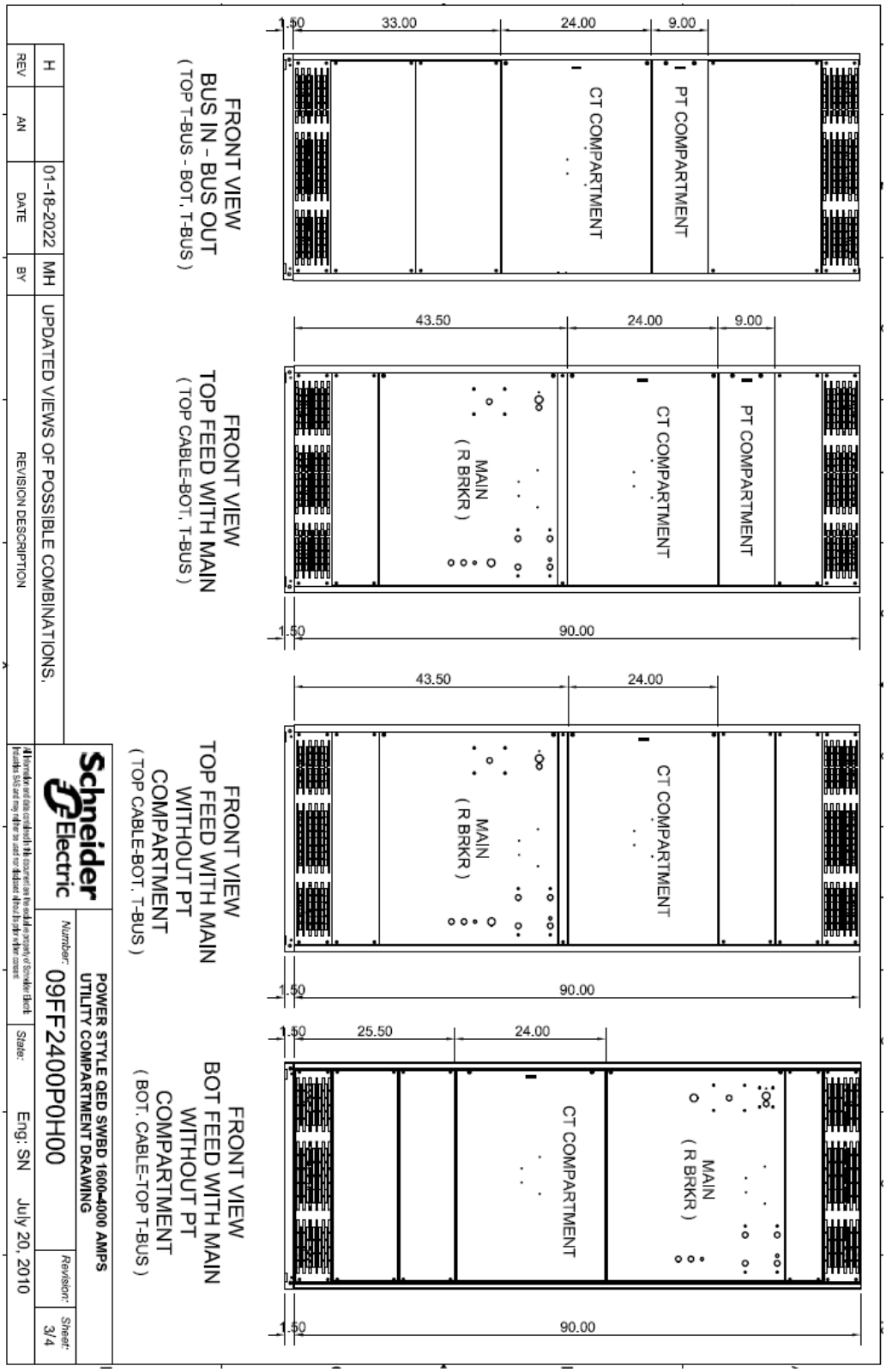
Figure 1001-4B (Sheet 2 of 4)



AMEREN APPROVED SWITCHBOARD - SQUARE D / SCHNEIDER ELECTRIC 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES - CT / PT COMPARTMENT

Reference: Schneider #09FF2400P0H00 (Sheet 3 of 4)

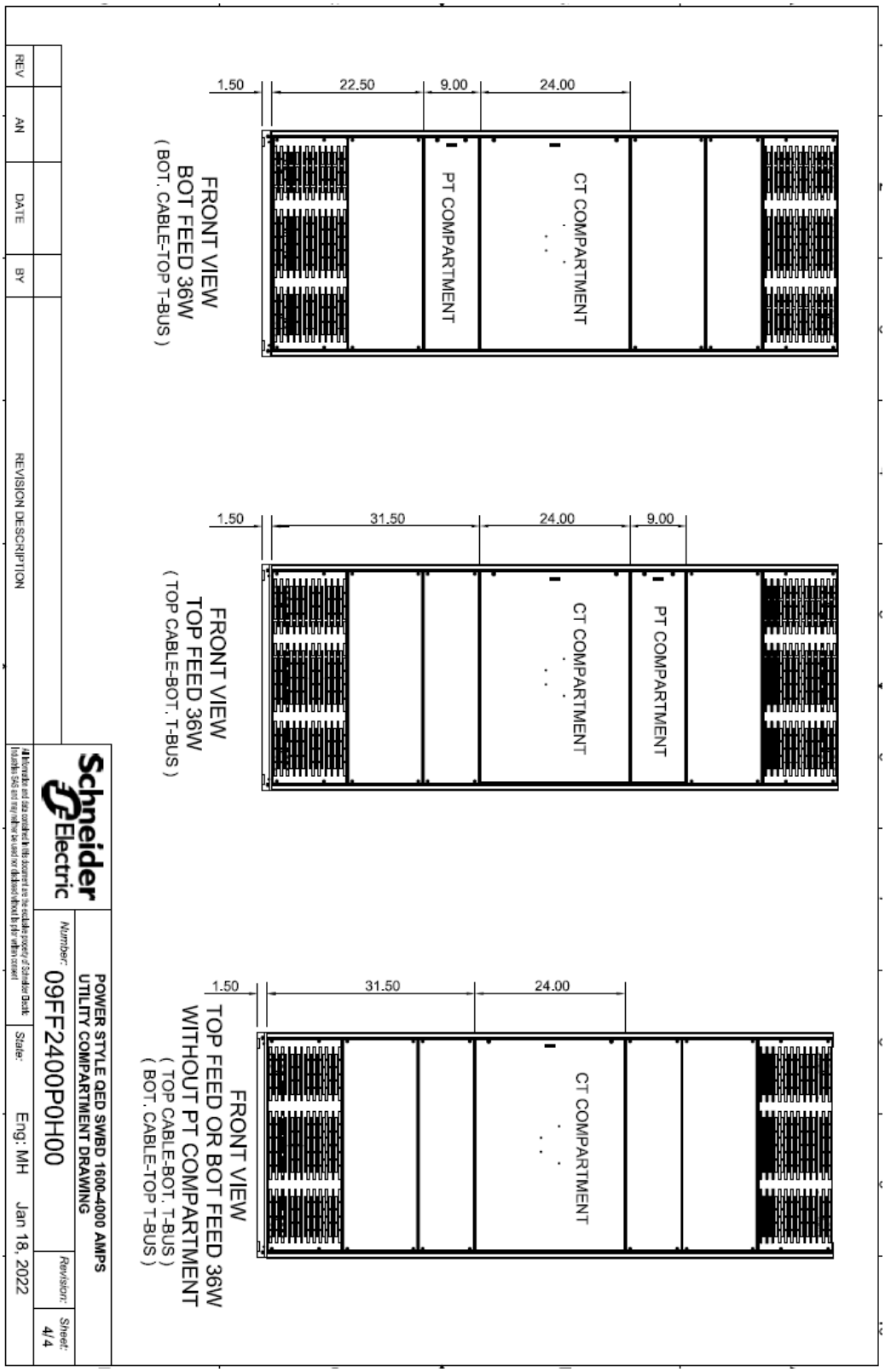
Figure 1001-4B (Sheet 3 of 4)



AMEREN APPROVED SWITCHBOARD - SQUARE D / SCHNEIDER ELECTRIC 208Y/120V; 480Y/277V 1201 - 4000 AMPERES - CT / PT COMPARTMENT

Reference: Schneider #09FF2400P0H00 (Sheet 4 of 4)

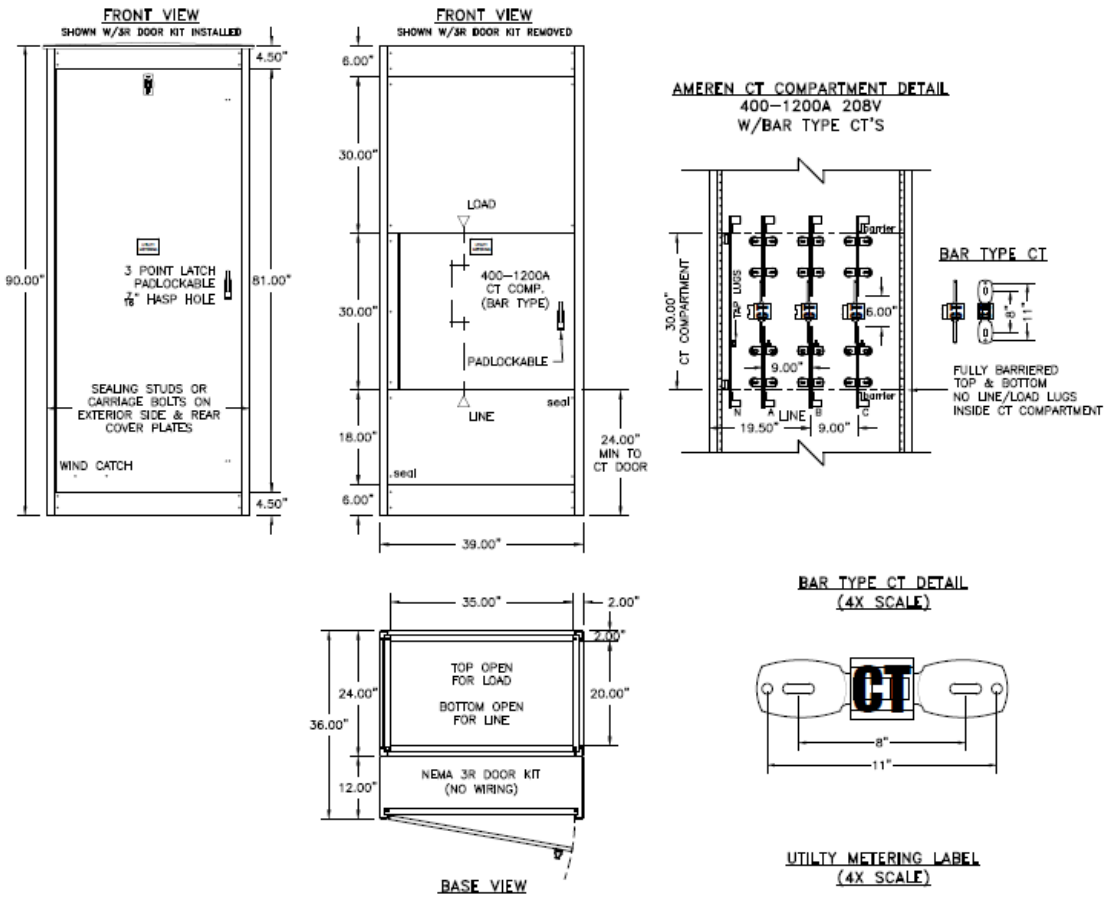
Figure 1001-4B (Sheet 4 of 4)



AMEREN APPROVED SWITCHBOARD - AMERICAN MIDWEST POWER 208Y/120 VOLT, 800 - 1200 AMPERES - CT COMPARTMENT
Reference: AMESWDCTBAR120
Figure 1001-5A

AMERICAN MIDWEST POWER
3131 VICKSBURG LANE
MINNEAPOLIS, MINNESOTA 55447
PHONE (763) 551-1555 FAX (763) 551-9275

JOB NAME: AMEREN CT COMPARTMENT DETAILS (400-1200A, 208V)				QUOTE NUMBER: 041322 (JG)
CUSTOMER: –				FILE NUMBER: –
SALES APPROVAL: INT: DATE:	DRAWN BY: TDK	REV DATE: 07/06/22	SCALE: NA	CUSTOMER NUMBER: –



NOTES:
1)LUG INCLUDED FOR ALL THREE PHASES AND NEUTRAL ON SOURCE SIDE OF CT'S FOR #10 GA WIRE LEADS FROM PT'S
2)ALL CT AND PT COVERS MUST BE HINGED & LOCKABLE
3)SEALING STUDS OR CARRIAGE BOLTS ON ALL EXTERNAL COVERS

TYPE F SWITCHBOARD SPECIFICATION

FRONT ACCESSIBLE CLASS 1, NEMA 3R, DEADFRONT CONSTRUCTION FORMED 12GA. FRAMING WITH 14GA. STEEL PAN FORMED COVER PLATES POWDER PAINTED ASA 61 GRAY. PLATED BUS. U.L. LISTED AND LABELED AS SUITABLE FOR SERVICE ENTRANCE EQUIPMENT PER U.L. 891. STANDARD FAULT CURRENT RATING: 85,000A; 60HZ.

BILL OF MATERIALS

ITEM	QTY	CATALOG NUMBER	DESCRIPTION	SUPPLIED
1	1	CT–	400–1200A UTILITY BAR TYPE CT COMP	AMP
2				
3				
4				
5				

NOTES:

AMPS:	VOLTAGE:	SYSTEM:	AIC:	BUS:	DATE:	DRAWING NO:
1200	208Y/120V	3ø 4W	85K	AL	04/13/22	–

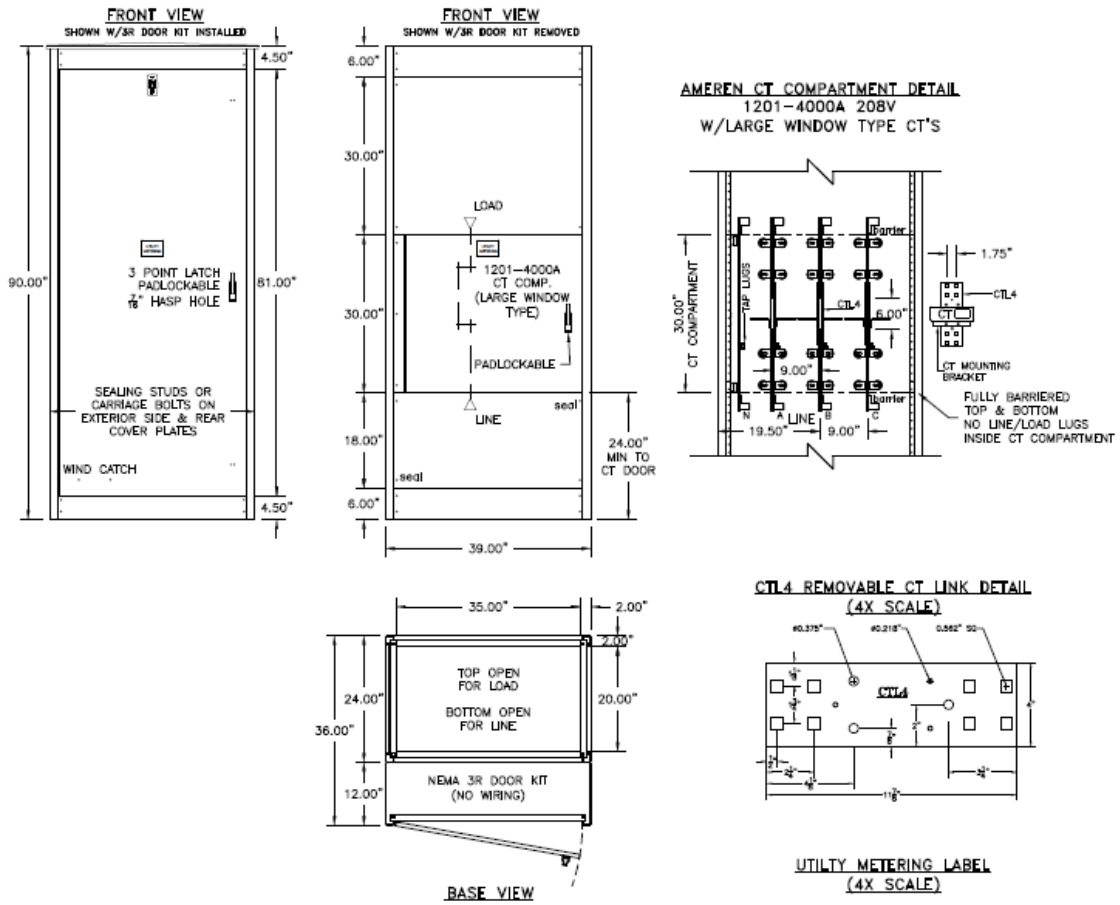
AMEREN APPROVED SWITCHBOARD - AMERICAN MIDWEST POWER 208Y/120 VOLT, 1201 - 4000 AMPERES - CT COMPARTMENT

Reference: MESWDCTWIN120

Figure 1001-5B

AMERICAN MIDWEST POWER
3131 VICKSBURG LANE
MINNEAPOLIS, MINNESOTA 55447
PHONE (763) 551-1555 FAX (763) 551-9275

JOB NAME: AMEREN CT COMPARTMENT DETAILS (1201–4000A, 208V)				QUOTE NUMBER: 041322 (JG)
CUSTOMER: –				FILE NUMBER: –
SALES APPROVAL: INT: DATE:	DRAWN BY: TDK	REV DATE: 07/06/22	SCALE: NA	CUSTOMER NUMBER: –



NOTES:
1)LUG INCLUDED FOR ALL THREE PHASES AND NEUTRAL ON SOURCE SIDE OF CT'S FOR #10 GA WIRE LEADS FROM PT'S
2)ALL CT AND PT COVERS MUST BE HINGED & LOCKABLE
3)SEALING STUDS OR CARRIAGE BOLTS ON ALL EXTERNAL COVERS

TYPE F SWITCHBOARD SPECIFICATION

FRONT ACCESSIBLE CLASS 1, NEMA 3R, DEADFRONT CONSTRUCTION FORMED 12GA. FRAMING WITH 14GA. STEEL PAN FORMED COVER PLATES POWDER PAINTED ASA 61 GRAY. PLATED BUS. U.L. LISTED AND LABELED AS SUITABLE FOR SERVICE ENTRANCE EQUIPMENT PER U.L. 891. STANDARD FAULT CURRENT RATING: 85,000A; 60HZ.

BILL OF MATERIALS

ITEM	QTY	CATALOG NUMBER	DESCRIPTION	SUPPLIER
1	1	CT–	1201–4000A UTILITY CT COMP(LARGE WINDOW TYPE)	AMP
2				
3				
4				
5				

NOTES:

AMPS:	VOLTAGE:	SYSTEM:	AIC:	BUS:	DATE:	DRAWING NO:
1201	208Y/120V	3ø 4W	85K	AL	04/13/22	–

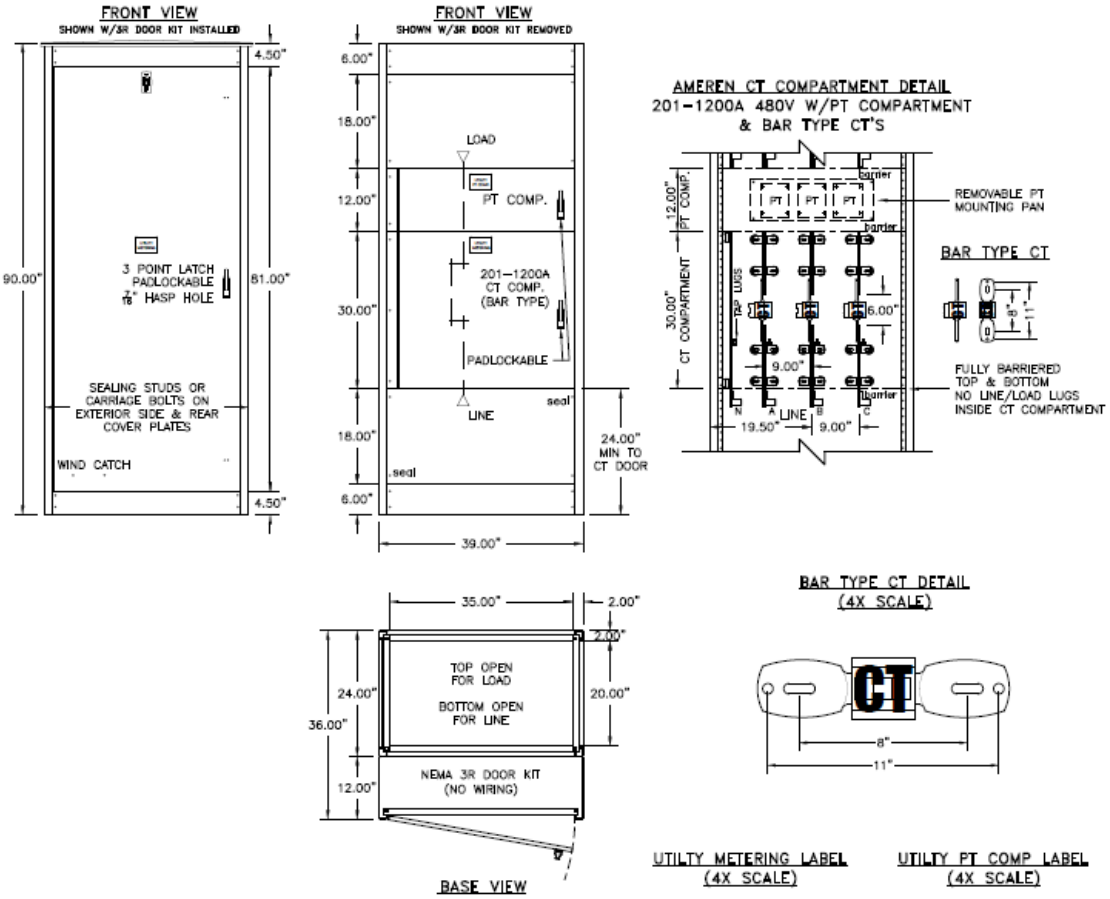
AMEREN APPROVED SWITCHBOARD - AMERICAN MIDWEST POWER 480Y/277 VOLT, 800 - 1200 AMPERES - CT / PT COMPARTMENT

Reference: MESWDCTBAR480

Figure 1001-5C

AMERICAN MIDWEST POWER
3131 VICKSBURG LANE
MINNEAPOLIS, MINNESOTA 55447
PHONE (763) 551-1555 FAX (763) 551-9275

JOB NAME: AMEREN CT COMPARTMENT DETAILS (201-1201A, 480V)				QUOTE NUMBER: 041322 (JG)
CUSTOMER: –				FILE NUMBER: –
SALES APPROVAL: INT: DATE:	DRAWN BY: TDK	REV DATE: 07/06/22	SCALE: NA	CUSTOMER NUMBER: –



NOTES:
1)LUG INCLUDED FOR ALL THREE PHASES AND NEUTRAL ON SOURCE SIDE OF CT'S FOR #10 GA WIRE LEADS FROM PT'S
2)ALL CT AND PT COVERS MUST BE HINGED & LOCKABLE
3)SEALING STUDS OR CARRIAGE BOLTS ON ALL EXTERNAL COVERS

TYPE F SWITCHBOARD SPECIFICATION

FRONT ACCESSIBLE CLASS 1, NEMA 3R, DEADFRONT CONSTRUCTION FORMED 12GA. FRAMING WITH 14GA. STEEL PAN FORMED COVER PLATES POWDER PAINTED ASA 61 GRAY. PLATED BUS. U.L. LISTED AND LABELED AS SUITABLE FOR SERVICE ENTRANCE EQUIPMENT PER U.L. 891. STANDARD FAULT CURRENT RATING: 85,000A; 60HZ.

BILL OF MATERIALS

ITEM	QTY	CATALOG NUMBER	DESCRIPTION	SUPPLIER
1	1	CT–	201–1200A UTILITY BAR TYPE CT COMP	AMP
2	1	AMECTPT3	UTILITY PT MOUNTING PAN	AMP
3				
4				
5				

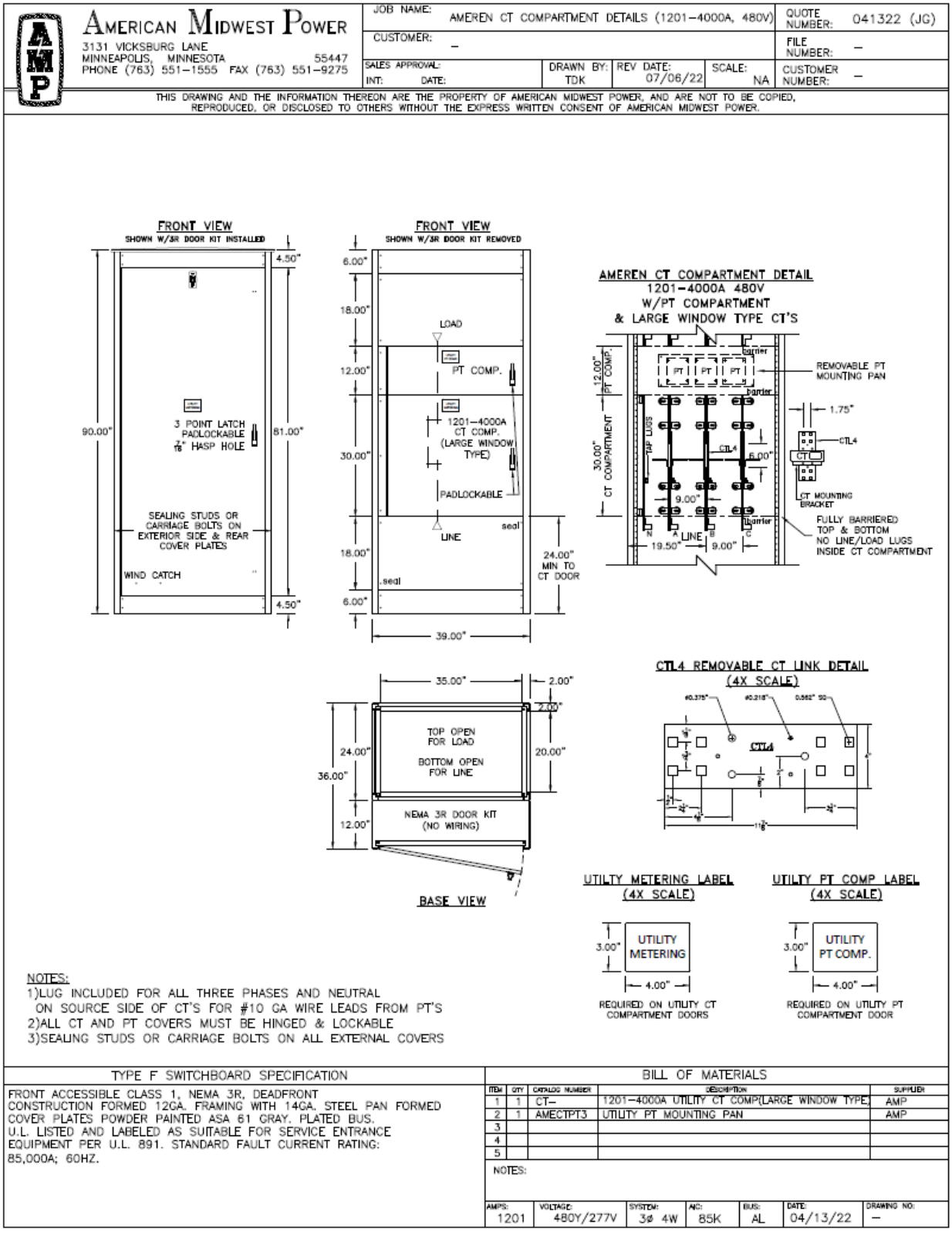
NOTES:

AMPS:	VOLTAGE:	SYSTEM:	AIC:	BUS:	DATE:	DRAWING NO:
1200	480Y/277V	3ø 4W	85K	AL	04/13/22	–

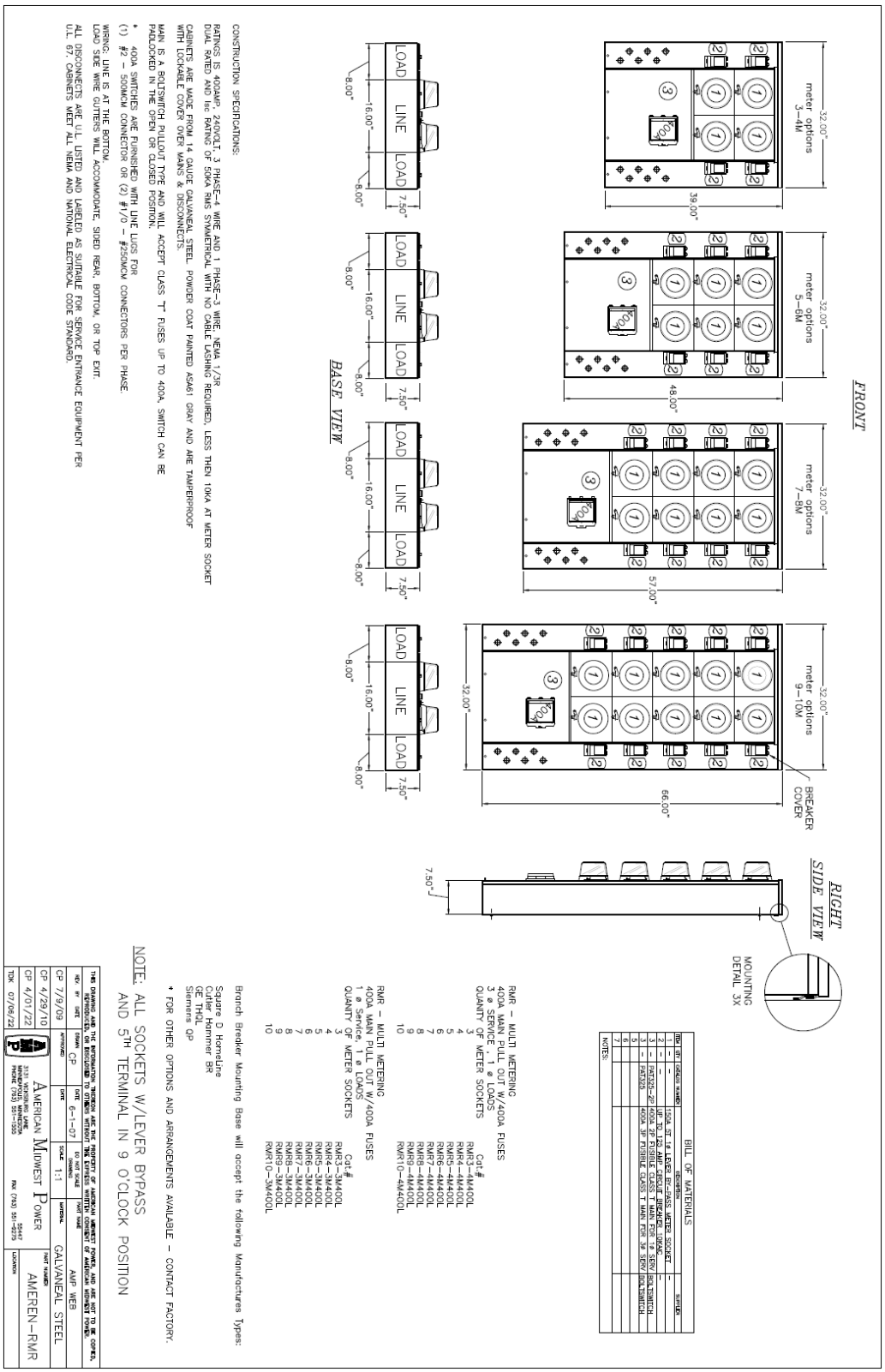
AMEREN APPROVED SWITCHBOARD - AMERICAN MIDWEST POWER 480Y/277 VOLT, 1201 - 4000 AMPERES - CT / PT COMPARTMENT

Reference: MESWDCTWIN480

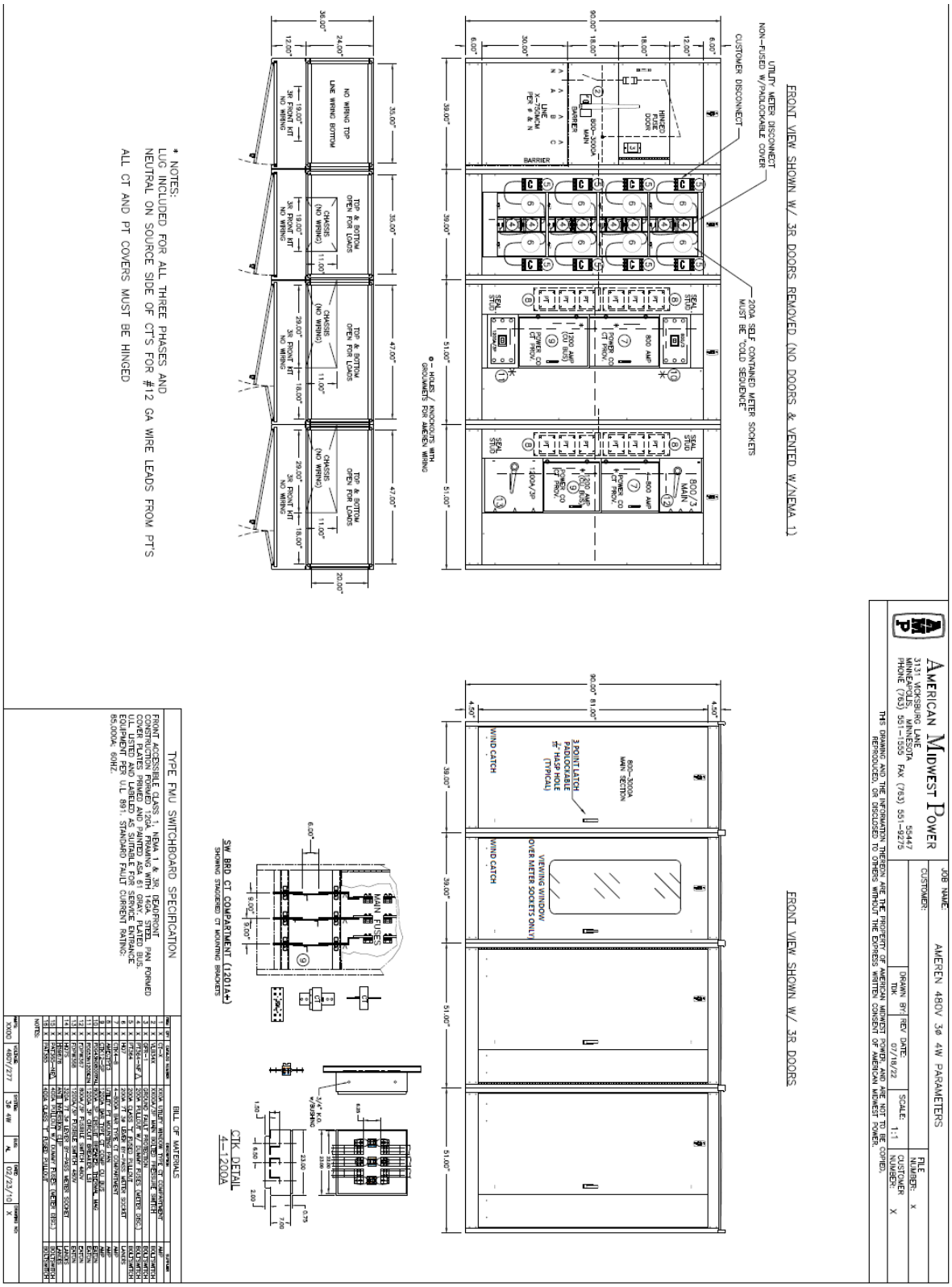
Figure 1001-5D



AMEREN APPROVED SWITCHBOARD - AMERICAN MIDWEST POWER
480 VOLTS METER CENTER
Reference: AMESWDCTWIN480
Figure 1001-5E



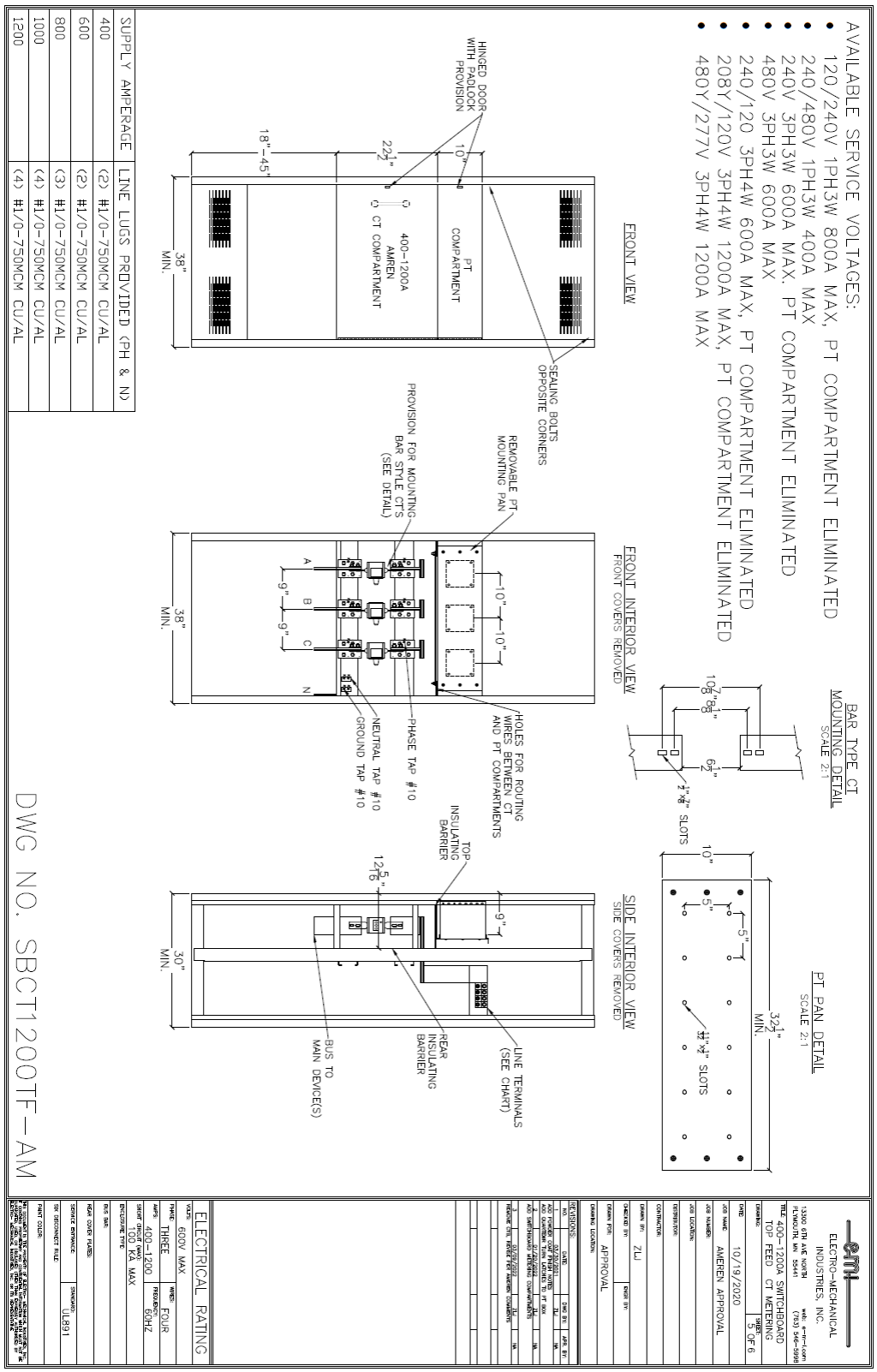
AMEREN APPROVED SWITCHBOARD - AMERICAN MIDWEST POWER
480 VOLTS METER CENTER
Reference: AMESWDCTWIN480
Figure 1001-5F



AMEREN APPROVED SWITCHBOARD - EMI CT / PT COMPARTMENT 208Y/120V; 480Y/277V, 800 - 1200 AMPERES - OVERHEAD FEED

Reference: EMI #SBCT1200TF-AM

Figure 1001-6A

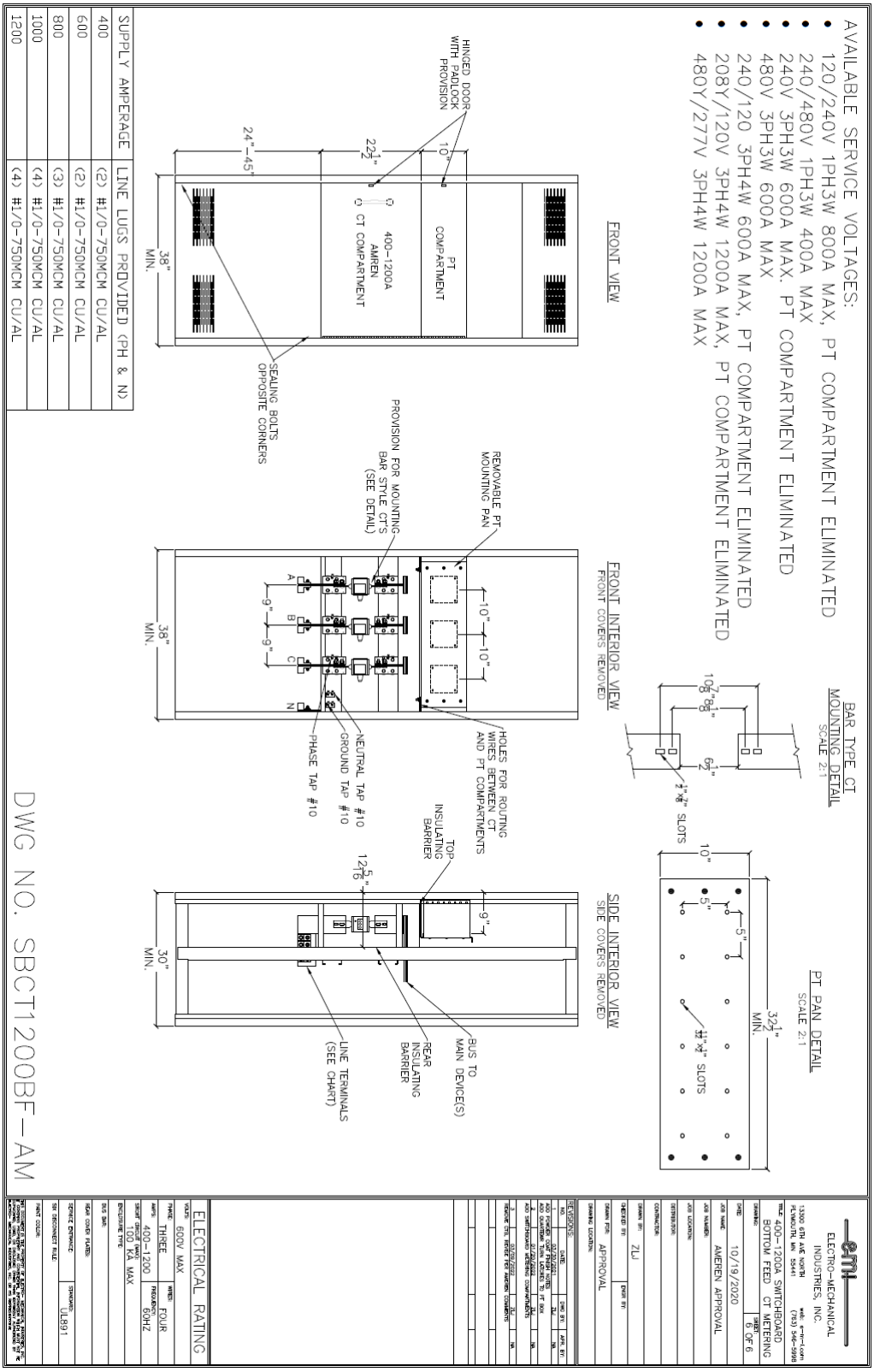


SUPPLY AMPERAGE	LINE LUGS PROVIDED (PH & N)
400	(2) #1/0-750MCM CU/AL
600	(2) #1/0-750MCM CU/AL
800	(3) #1/0-750MCM CU/AL
1000	(4) #1/0-750MCM CU/AL
1200	(4) #1/0-750MCM CU/AL

AMEREN APPROVED SWITCHBOARD - EMI CT / PT COMPARTMENT 208Y/120V; 480Y/277V, 800 - 1200 AMPERES - UNDERGROUND FEED

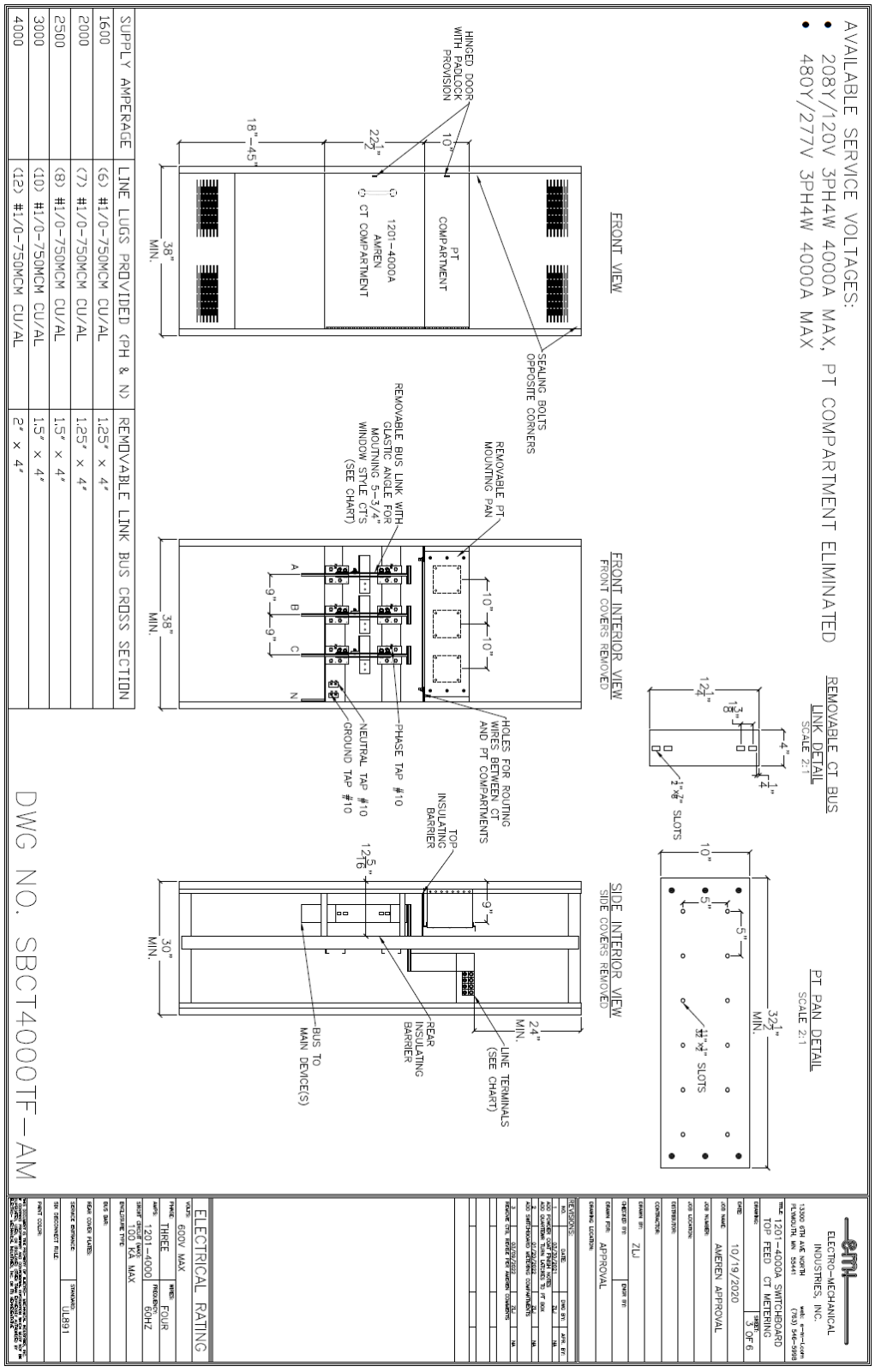
Reference: EMI #SBC1200BF-AM

Figure 1001-6B



SUPPLY AMPERAGE	LINE LUGS PROVIDED (PH & N)
400	(2) #1/0-750MCM CU/AL
600	(2) #1/0-750MCM CU/AL
800	(3) #1/0-750MCM CU/AL
1000	(4) #1/0-750MCM CU/AL
1200	(4) #1/0-750MCM CU/AL

AMEREN APPROVED SWITCHBOARD - EMI CT / PT COMPARTMENT
208Y/120V; 480Y/277V, 1201 - 4000 AMPERES - OVERHEAD FEED
Reference: EMI #SBCT4000TF-AM
Figure 1001-6C

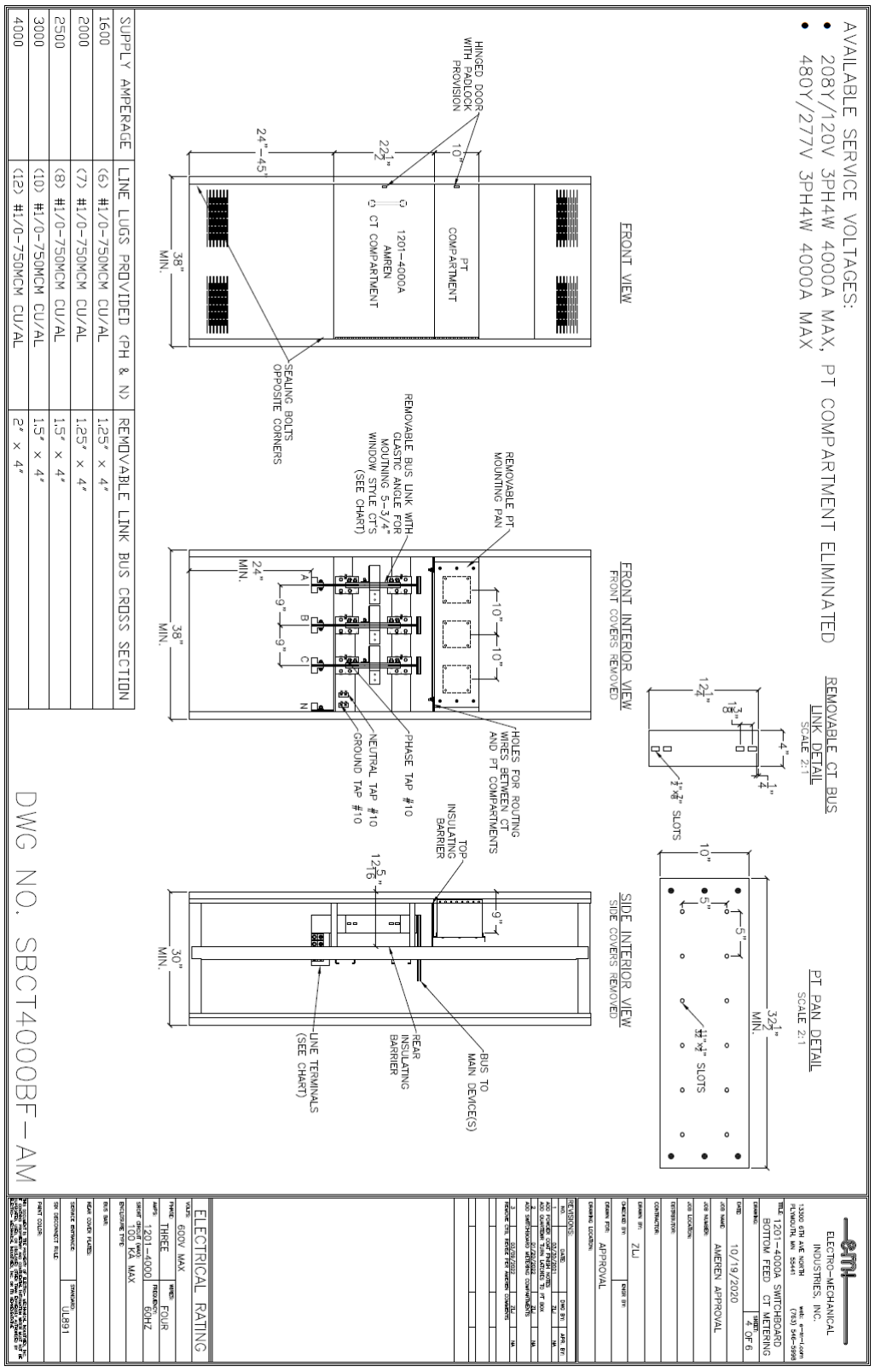


SUPPLY AMPERAGE	LINE LUGS PROVIDED (PH & N)	REMOVABLE LINK BUS CROSS SECTION
1600	(6) #1/0-750MCM CU/AL	1.25" x 4"
2000	(7) #1/0-750MCM CU/AL	1.25" x 4"
2500	(8) #1/0-750MCM CU/AL	1.5" x 4"
3000	(10) #1/0-750MCM CU/AL	1.5" x 4"
4000	(12) #1/0-750MCM CU/AL	2" x 4"

AMEREN APPROVED SWITCHBOARD - EMI CT / PT COMPARTMENT 208Y/120V; 480Y/277V, 1201 - 4000 AMPERES - UNDERGROUND FEED

Reference: EMI #SBCT4000BF-AM

Figure 1001-6D



SUPPLY AMPERAGE	LINE LUGS PROVIDED (PH & N)	REMOVABLE LINK BUS CROSS SECTION
1600	(6) #1/0-750MCM CU/AL	1.25" x 4"
2000	(7) #1/0-750MCM CU/AL	1.25" x 4"
2500	(8) #1/0-750MCM CU/AL	1.5" x 4"
3000	(10) #1/0-750MCM CU/AL	1.5" x 4"
4000	(12) #1/0-750MCM CU/AL	2" x 4"

Section 1100
Ameren Approved Metering Equipment List

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

BuildWithAmeren.com

Ameren is no longer sending any hard copies of Ameren Electric Service Manual and of the Ameren Approved Metering Equipment List. If you would like to receive updates regarding the Electric Service Manual and Ameren Approved Metering Equipment List by email, please use the link above and complete the form. By completing this form, you are giving us permission to notify you of important manual updates. Ameren will not share your information or use it for any other purpose. If you were previously receiving electronic update notices and have stopped receiving these, please submit the electronic application again as our systems are being updated.

1200.01 STANDBY GENERATION OVERVIEW

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. The Company reserves the right to inspect Customer installed generation and associated equipment even though it is behind the main service disconnecting means.

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 below.

1200.02 AMEREN ILLINOIS - REVIEW AND REQUIREMENTS

Ameren Illinois **DOES NOT** require the submittal of plans for an emergency standby generator with an open transition transfer. However, Ameren Illinois **DOES** require a review of all generators that will be operated in parallel, or any emergency / standby generator that is paralleled with Ameren's system for 100 milliseconds or longer. If the generator does not operate in parallel with Ameren, or if the closed transition is less than 100 milliseconds, there is no requirement to notify Ameren of this installation.

An exception to this policy is for the secondary network systems found in Peoria, Decatur, and Bloomington where closed transition generators of any type **ARE NOT** allowed.

When operating in parallel for 100 milliseconds or longer, an application must be submitted to Ameren Illinois prior to purchase or installation of equipment that details what type of generator equipment will be installed and how it will be used. Ameren Illinois' installation requirements and application form can be found at **BuildWithAmeren.com** or can be obtained by contacting the Ameren Illinois Construction Services Team at **1-888-659-4540** or by email at **IllinoisConstruction@ameren.com**.

1200.03 AMEREN MISSOURI - REVIEW AND REQUIREMENTS

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

Ameren Missouri's installation requirements and application form can be found at **BuildWithAmeren.com** or can be obtained by contacting the Ameren Missouri Construction Services Team at **1-866-992-6619** or by email at **ConstructionHotline@ameren.com**

1200.04 BACKUP GENERATION REQUIREMENTS

1. Main service disconnect that is padlockable in the open position if the Ameren service being backed up is less than 600 volts. In lieu of a padlockable main service disconnect, a lockable generator disconnect switch may be utilized.
2. For one- and two-family dwelling units, an emergency shutdown device must be located at a readily accessible outdoor location when a standby generator is installed. This disconnecting means shall be lockable in the open position. This requirement is not applicable for cord-and-plug-connected portable generators, refer to **2020 NEC 445.18 (D)**.

3. Single “visible open” disconnect device per generating unit if the Ameren service being backed up is greater than 600 volts - refer to Ameren's full requirements for details on satisfying this requirement.
4. Transfer equipment (manual or automatic) to prevent inadvertent continuous interconnection of sources.
5. Signage permanently installed at the revenue meter indicating:
   A. the presence of generation and
   B. location of the padlockable main service disconnect or a padlockable generator disconnect for isolation. The generator disconnect must be:
      - Located outside where readily accessible
      - Plainly indicate whether in the open (OFF) or close (ON) position
      - Can be either a knife blade switch, a load-break rated pull out switch, or circuit breaker
6. Signage permanently installed at the padlockable main service disconnect or generators disconnect for identifying its purpose.

1200.05 REQUIREMENTS FOR OPEN TRANSITION

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

1200.06 REQUIREMENTS FOR CLOSED (PARALLEL) TRANSITION

1. Any of the following methods can be used:
   a) Integral automatic transfer switch set
   b) Two or more solid blade disconnects or circuit breakers
2. Transfer times of less than 100 milliseconds in duration.
3. Synchronizing capability to safely tie the sources together.
4. Transfer failure scheme for opening one of the sources when closed transition exceeds a maximum two (2.0) second time delay.
5. Undervoltage protection to prevent a closed transition transfer when the Ameren source is not present.
6. Open transition manual “bypass” (i.e., auto disable) is highly recommended, though not required.

7. For additional requirements, refer to the **Foreword** of this manual for contact information to schedule an appointment with an Ameren engineering representative.

1200.07 ADDITIONAL REQUIREMENTS FOR PROGRAMMABLE LOGIC CONTROLLERS (PLC)

1. Independent hard-wired backup control scheme to prevent extended paralleling.
2. Enabled when transfer scheme is in “automatic” and disabled when transfer scheme is in “manual”.
3. Automatic transfer disabled if any of the switches or circuit breakers being controlled is tripped manually.
4. Shall not lose power as a direct result of automatic transfer switching operations.
5. For additional requirements, refer to the **Foreword** of this manual for contact information to schedule an appointment with an Ameren Engineering Representative.

1300.01 SYSTEM VOLTAGE AND GENERAL REQUIREMENTS

Voltage offered:
The St. Louis Downtown Underground secondary network distribution voltage is 216Y/125 volts, three-phase, and four-wire (**See ASM section 1300.03** for boundaries of the St. Louis Downtown Underground District). For engineering reasons, the Company may offer 480Y/277 volts, three−phase, four−wire service where the loads warrant this voltage; however, 480Y/277 volts secondary metered service can only be provided by padmount transformation or customer indoor substation transformers, both located on customer property. Easements will be required as a condition of service.

Large loads, at the Company's discretion, may be supplied and metered directly at the primary rate from either the St. Louis Downtown 13.8 kV or all underground 12.47 kV radial distribution system in other locations.

Choice of voltage and type of system offered depends on location and size of load. The service point of delivery (not metering point) is at the Company's discretion. The Customer shall consult Company to determine the point of delivery, service voltage, and method of supply that will be available, prior to beginning customer engineering or purchasing equipment.

Drawing submittals:
All proposed customer equipment locations, electrical configuration and ratings, and equipment manufacturer data sheets shall be submitted to the Company for review and approval (in terms of compliance with the Ameren Electric Service Manual or ASM rules and requirements) prior to purchasing or installing said equipment. The customer shall provide site plan drawings and a riser diagram (or one- line) for Company review and approval. The Company recommends equipment and design drawing review documents to be submitted at the early stages of the project (e.g., prior to the start of customer construction) to avoid in-service date delays and additional customer incurred costs. Not all requirements for underground service are provided within this document; the Company will provide any additional requirements and documents once a Company engineer has been assigned to the project.

Service to new or existing buildings:
Service requests for structures where service does not exist shall be considered new business. Existing building or other structure renovations with new or upgraded loads, regardless of previous building loading or use – at the Company's discretion – shall be considered new business and subject to all requirements and restrictions within **ASM Section 1300**.

Pulling Eye(s) (PE):
Customer shall provide pulling eyes and similar equipment for Company to pull primary and secondary cables that are not addressed within the Ameren Customer Indoor Substation XS-50B document. Ameren shall determine the pulling eye(s) quantity and recommended locations during the design process, based on the customer electrical room configuration. The customer shall provide the services of a professional engineer (PE) to design the pulling eye (unless provided by Ameren), its anchoring system, and the evaluation of the building structures for pulling eye anchor suitability. The customer's PE shall provide a copy of the PE design drawing for Company records. Ameren will provide the maximum calculated pulling tension – with a safety factor of 2, and the minimum inside dimensions for design of the pulling eye (as required) and the anchoring system.

Equipment pad location:
Equipment pads for transformers and switchgear shall be at grade, on earthen soil, and fully clear overhead for the entire equipment pad and working clearance area. The Company defines "grade" as the same elevation as the City R.O.W. street grade. Padmount transformers and switchgear pads on concrete slabs or other structures that are not on earthen soil (e.g., parking garage structure with floors below) shall not be allowed. Additionally, the padmount equipment shall be located where it can be accessed by Company vehicles – including cranes for lifting – 24/7/365, for the life of service and equipment. If access cannot be provided from the customer's property or from the street R.O.W., the customer may be required to secure easements for Company vehicle access, in perpetuity.

Conduit installation:
In accordance with the Company's tariffs filed with the MOPCS, the customer shall provide and install all underground conduit systems within the bounds of the development
– typically, the property line – in accordance with the Company's specifications and requirements. The customer shall provide all labor and materials to install conduit systems – to include, but not be limited to conduit, spacers, pull ropes, manholes (from Ameren's supplier), expendables, bollards, and other materials. Ameren will provide equipment pads, design drawings, and standards to aid in the construction of customer provided conduit systems.

Alternatives to Ameren preferred method of service:
At the Company’s discretion, alternatives to the Ameren preferred method of service may be considered: however, additional Customer costs may be incurred under the special facility rules.

Customer requested variances to any requirements within ASM Section 1300, the customer shall secure written approval for the variance from the Ameren Supervising Engineer of the appropriate operating center, irrespective of any verbal approvals. The variance shall not be considered valid or approved unless the variance is specific and provided in writing to the customer by Ameren.

1300.02 CUSTOMER INDOOR SUBSTATIONS

Secondary metered service shall be provided from a customer indoor substation, or indoor sub where outdoor space is not available. When required by municipal ordinance or required by other **ASM Section 1300** subsections, the Company will provide customer requirements and specifications for the indoor sub and will install, own, and maintain primary switches, primary fuses, primary equipment enclosures and cables, and transformers.

The customer shall provide the indoor sub space and building elements in accordance with Company specifications and requirements. Customer responsible building elements include but are not limited to; the physical two room space with access well, all doors, oil retention system, grounding system, lighting and receptacles, equipment stands, access pits, conduit or cable tray systems, grates, and ladders. An easement for the indoor substation space shall be required as a condition of service.

The customer shall contact the appropriate Company Division operating center prior the desired in−service date. 9 to 12 months is required to allow for Company/Customer engineering, equipment purchase, and construction.

Although predominantly in downtown St. Louis, indoor subs can be built within any building that is within the Company's service territory, if approved by the Company. Where space is available and meets Company requirements, padmount equipment (switchgear and transformer) is the preferred delivery method.

1300.03 216Y/125V NETWORK SERVICE

Consideration for network distribution system (point of service) qualification shall include new services (where none exists), existing service upgrades, and building renovation related service requests. At the Company's discretion − Customers requesting new or continued network service may qualify to be connected to or continue to be served from an existing downtown St. Louis 216Y/125 volt network distribution system if the proposed, upgraded, or continued service connection meets the following and other applicable requirements within this service manual:

The network service connection is within the Underground District network service area, as defined in the Ameren Missouri's Rules and Regulations − bounded by 22nd Street, Cole Street, Spruce Street, and the Mississippi River

The proposed network entrance points for the building (or combination of buildings) or structure shall be at only one location, with the Company provided network service cables terminated as noted in the following tap box **ASM section 1300**.

Service or services distribution panel(s) aggregate size at 216Y/125 volts equals 1,200 amperes or less (this means that if not upgraded to the radial distribution system, the customer's network service will be restricted to 1200 amperes at 216Y/125 volts, in perpetuity); if a customer appears to qualify for network service based on the aggregate panel size, but also appears to have building capacity for load growth beyond 1200A, said new service may still not qualify for network service, at the Company's discretion.

Services greater than 1200 amperes (aggregate) shall be supplied from the 13.8 kV radial distribution system (point of service) by means of a padmount transformer or customer indoor substation (see **ASM section 1300.02**).

For new 480Y/277 volts customer requested services, Ameren will not construct any new spot networks (480Y/277 or 216Y/125 volt services by network transformers within sidewalk vaults). Customers seeking 480Y/277 volts secondary metered service within the network service area, secondary service shall be supplied from the 13.8 kV radial system by means of a padmount transformer or customer indoor substation.

Once a Customer qualifies for 216Y/125 volt network distribution service, service connection at the service entrance point shall be by one of three service connection means:

1) Company network cables terminated at a customer provided network tap box (see tap box spec **ASM Figure 1300−1A and 1300-1B**).

2) Company network cables terminated at a customer owned commercial grade 600 volts (or less) switchboard (see **ASM Figure 1300−2A**); or

3) Company network cables terminated at a self−contained meter enclosure. If the network service connection involves multiple commercial metered services at the same building, the Customer shall provide a network tap box, as specified in this **ASM section 1300**. Customer connections to the network distribution system shall be reviewed and approved by the Company's Underground Engineering Department prior to the start of any construction.

Drawings:

Figure 1300−1A Network Tap−Box Specification Drawing

Figure 1300−1B Network Tap−Box Side Compartment Spec Drawing

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

Figure 1300−2B Padmount Transformer High−Rise Service EQ Configuration

Due to the possibility of customer 216Y/125 volts distribution being exposed to available high fault currents when connected to the Company's downtown St. Louis 216Y/125 volts network distribution system, the Company and the City of St. Louis Authority Having Jurisdiction require a main switch and current limiting over−current protective device (OCPD) to be installed for all customer service entrance equipment, immediately downstream of the supply side termination lugs. The City of St. Louis is enforcing **NEC Article 110.10** in requiring an appropriate OCPD for customer equipment, for all customer service connections to the downtown network distribution system. Service connections to the downtown network distribution system, under **NEC Article 230.71**, Maximum Number of Disconnects, or the "6 Switch Rule," shall NOT be allowed.

1300.03A Network Distributed Resources Interconnect Requests

Customers requesting to connect Distributed Resources (DR) – i.e. solar voltaic, batteries, or motor generators – for the purposes of net−metering (not emergency or standby generation), to either the low voltage network distribution system (216Y/125 volt grid or a 480Y/277 volt spot network), shall comply with the Company's net metering network requirements as a condition of service, in addition to the standard requirements for service, as stated in the Company tariffs filed with the MOPSC. Underground Engineering will provide network service net-metering requirements (Network Distribution Resources (DR) Connection Engineering Guideline) upon request.

1300.04 Commercial / Residential High-Rise Multi-Meter Installations

For multi−story high rise residential projects and customer provided distribution equipment for metering on multiple floors – up to and including every floor – Ameren will approve such a customer distribution equipment configuration if the following numbered requirements are met:

1. The customer provided distribution system configuration meets **ASM Figure 1300−2A/2B.**

2. Bus duct riser distribution voltage can be either 480Y/277 volts 3−phase 4−wire or 208Y/120 volts 3−phase 4−wire (a combination of the two voltage configurations for the residential services shall not be allowed).

3. Secondary metering voltages shall be 480 volts − 120/240 volts 1−phase 3−wire or 480 volts − 120/208 volts 2−phase 3−wire, at the point of metering.

4. Secondary metering may be located on every floor.

5. Secondary metering voltages shall be balanced so that the 3−phase loads are balanced (e.g., for either 120/240 volts 1−phase 3−wire or 120/208V 2−phase 3−wire, rotate AØ−BØ, BØ−CØ, CØ−AØ, and soon).

6. All customer provided distribution equipment shall be new, meet local electrical codes, and UL Listed for their intended use.

7. The bus duct riser system shall include a main disconnect located at the service entrance point; the unmetered panel shall include only the secondary cable termination compartment (front access), the main disconnect and OCPD, and the bus duct connection point; all side and back compartments shall include factory installed tamper proof screws.

8. All distribution equipment on the metering floors shall be modular bus plug−in design, except only for the cable connections between the high and low side transformer connections.

9. Transformers on the metering floors shall be dry type transformers and shall meet the energy efficiency requirements of the DOE Energy Policy Act of 2005; refer to Federal Register 10CFR Part 431, date 4−18−13.

10. Transformers on the metering floors shall be sized in accordance with the local codes and shall have a minimum reserve capacity of 25%, over and above any code required excess capacity.

11. The metering spaces shall be sized to allow for future removal and replacement of the floor dry type transformer, and the metering space doorway shall be large enough to allow the transformer to be removed from the meter space, without removing the door from its hinges.

12. Floor metering space dry type transformers' size and weight shall be such that they can be moved up and down the building using a standard passenger elevator system.

13. The customer shall provide one spare dry type of transformer for each size that will be connected to the distribution equipment; the spare transformers shall be stored within the first meter room space and include labels to identify the transformer(s) as spare units.

14. The building distribution riser shall be a secondary bus duct riser – cable secondary risers shall not be allowed – and of sufficient ampacity (copper or AL conductors) to meet the local code requirements and the requirements of this **ASM section 1300**; the bus duct requirement includes any horizontal bus duct between the service entrance main disconnect switch and the transition to the vertical bus duct riser; relative to any existing bus duct that must be replaced (due to age or equipment failures), the replacement bus duct shall be bus duct with equivalent ratings and specifications.

15. The bus duct riser shall be designed such that the connection points for the bus duct are accessible only at the metering floors and shall accept bus plug−in devices to tap power to the metering floor.

16. The bus duct tap point on the metering floor shall include a disconnect so that the metering equipment on that floor can be de−energized and locked out, without having to de−energize the entire bus duct riser (and all other upstream and downstream customers).

17. The bus duct shall be sized to meet all local code requirements and ANSI / IEEE C84.1, Voltage Range A, at the point of utilization.

18. The customer shall be responsible to mitigate voltage flicker due to motor starting and / or other intermittent loads on the secondary side of the step−down dry−type transformer. The voltage flicker shall be less than the noticeable curve defined in ANSI / IEEE 141. The customer may be required to provide documentation indicating how this requirement is met.

19. Ameren shall reserve the right to review all proposed customer distribution equipment, to include, but not be limited to equipment sizes, configuration, disconnects, transformers, and metering equipment, prior to the customer releasing the equipment for fabrication, relative to compliance with Company service rules.

20. All proposed metering equipment shall comply will all Company metering requirements, as given in the current edition of the Ameren Electric Service Manual, and the requirements of this **ASM section 1300** for the purpose of metering multi−residential high-rise structures.
21. The customer shall provide a 120V 1P-20A receptacle within each meter center room for powering metering radial repeater equipment, as required. The 120V receptacle shall be located as directed by Ameren within the meter rooms. The customer shall also provide a conduit to the exterior of the building for pulling in an antenna cable between the meter center room repeater and an exterior antenna (final locations to be coordinated between Ameren and the customer).

23. The customer shall provide a detailed one-line diagram showing all proposed meter room equipment and their connection configuration and equipment ampacity sizes; this can be shown on the building one line or riser diagram.
24. All equipment within the metering room shall include provision for metering seals or locks and side panels shall include tamper proof screws to prevent access.
25. The dry−type transformer / metering room shall not be used as a janitorial or storage closet and shall not include customer equipment such as, but not limited to plumbing piping and controls and water heaters.
26. All customer metering equipment (bus duct riser, modular meter center equipment, and mains) and the customer metering equipment configuration shall be reviewed by the Company prior to the customer purchasing and installing such equipment.

This **ASM section 1300** also applies to high rise developments outside the downtown St. Louis service area, where secondary service is provided by means of a padmount transformer or customer indoor substation. In these cases, **ASM Figure 1300−2B** would apply for either a padmount or customer indoor sub installation transformer (the shown padmount in **ASM Figure 1300−2B** would be substituted with an indoor substation transformer−all other requirements remain the same).

Drawings:

ASM Figure 1300-1A – Network Tap-Box Specification Drawing
(216Y/125V NW System Customer Provided Utility NW Tap-Box)
This is referencing the tap box's short circuit rating, "withstand" is also referred to as Short Circuit Current Rating or SCCR in the current version of the NEC.

ASM Figure 1300-1B – Network Tap-Box Specification Drawing
(216Y/215V NW System Customer Provided Utility NW Tap-Box Cable Side Compartment Spec Drawing)

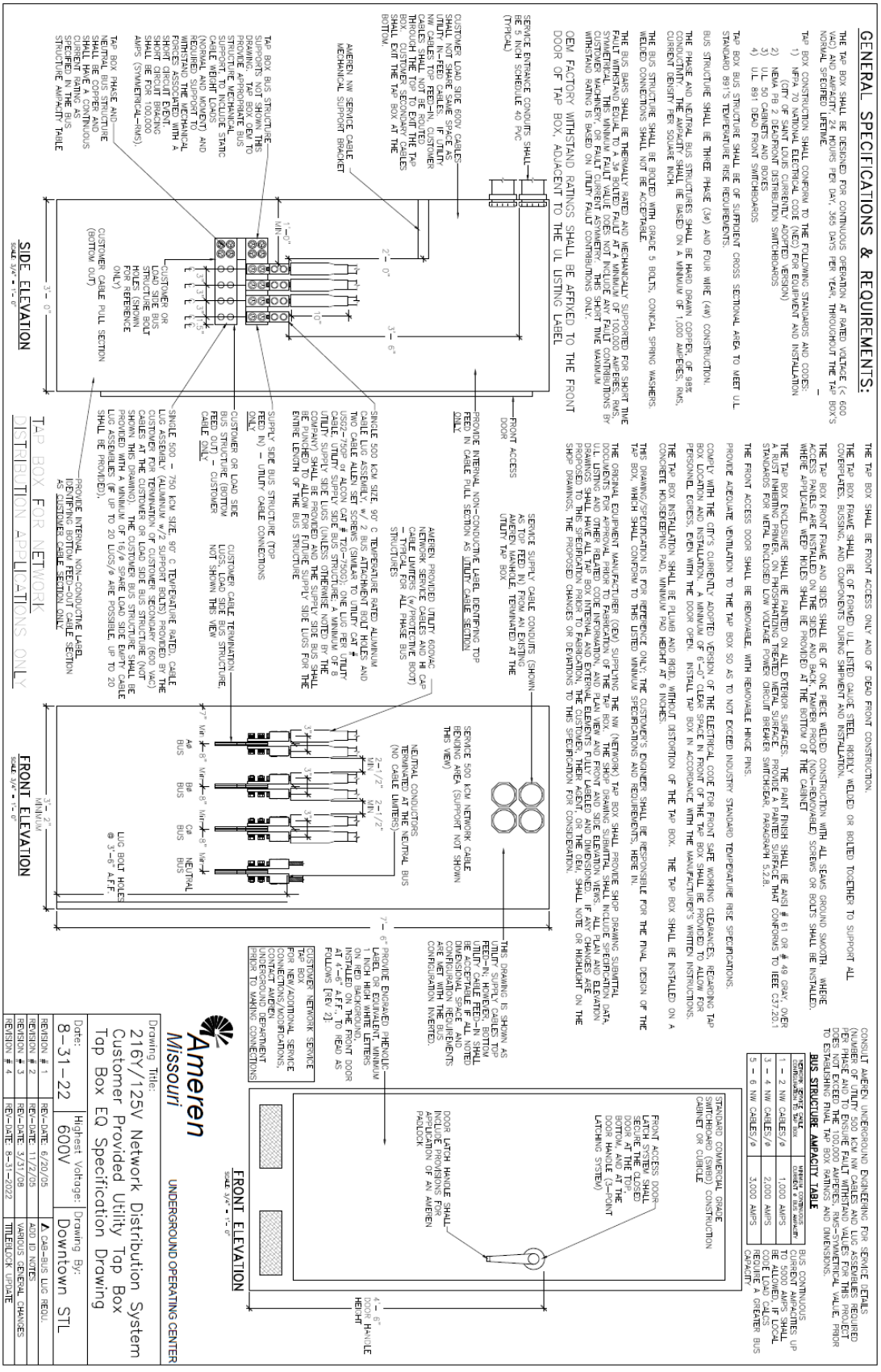
ASM Figure 1300-2A – Network High-Rise Service EQ Configuration
(216Y/125V Downtown High-Low Rise Lofts Resident / Commercial Service EQ Configuration)

This figure is referencing the GENERAL NOTES, residential meter centers may be located on every floor (see **ASM section 1300.04**, requirement # 4).

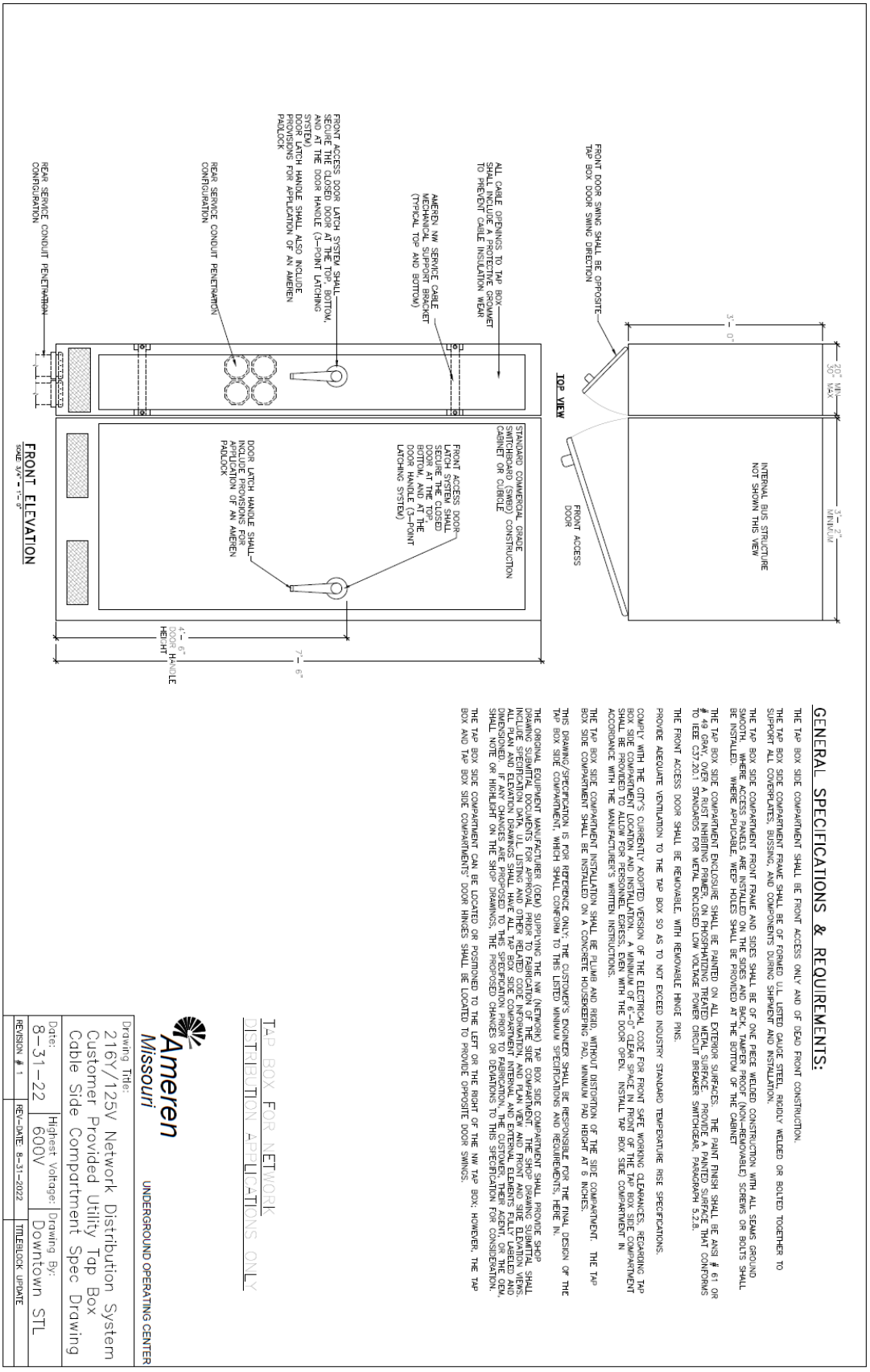
ASM Figure 1300-2B – Padmount Transformer High-Rise Service EQ Configuration
(208Y/120V Radial System Downtown High-Low Rise Lofts Residential / Commercial Service EQ Configuration)

Network Tap–Box Specification Drawing

Figure 1300–1A

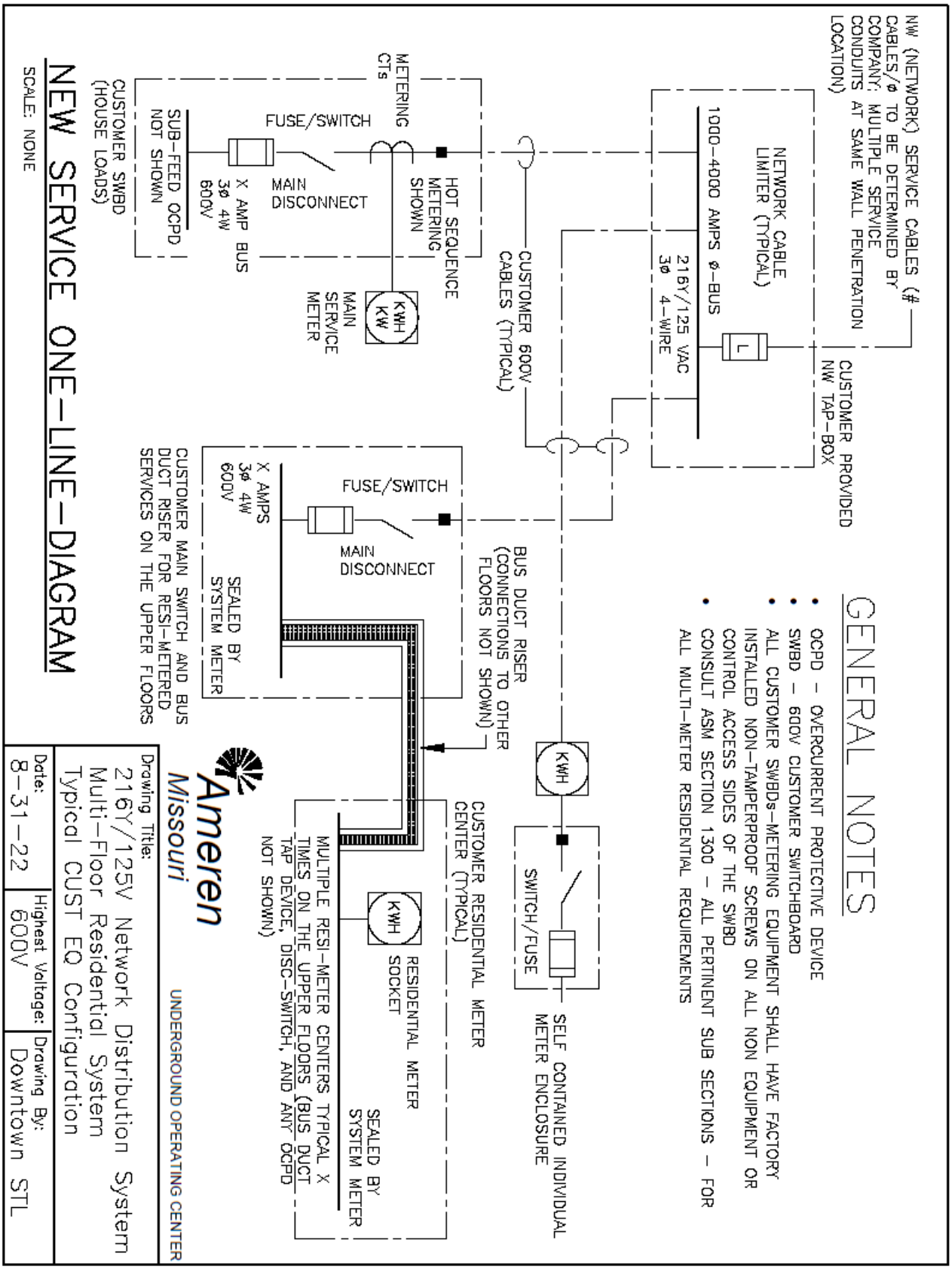


Network Tap–Box Specification Drawing
Figure 1300–1B

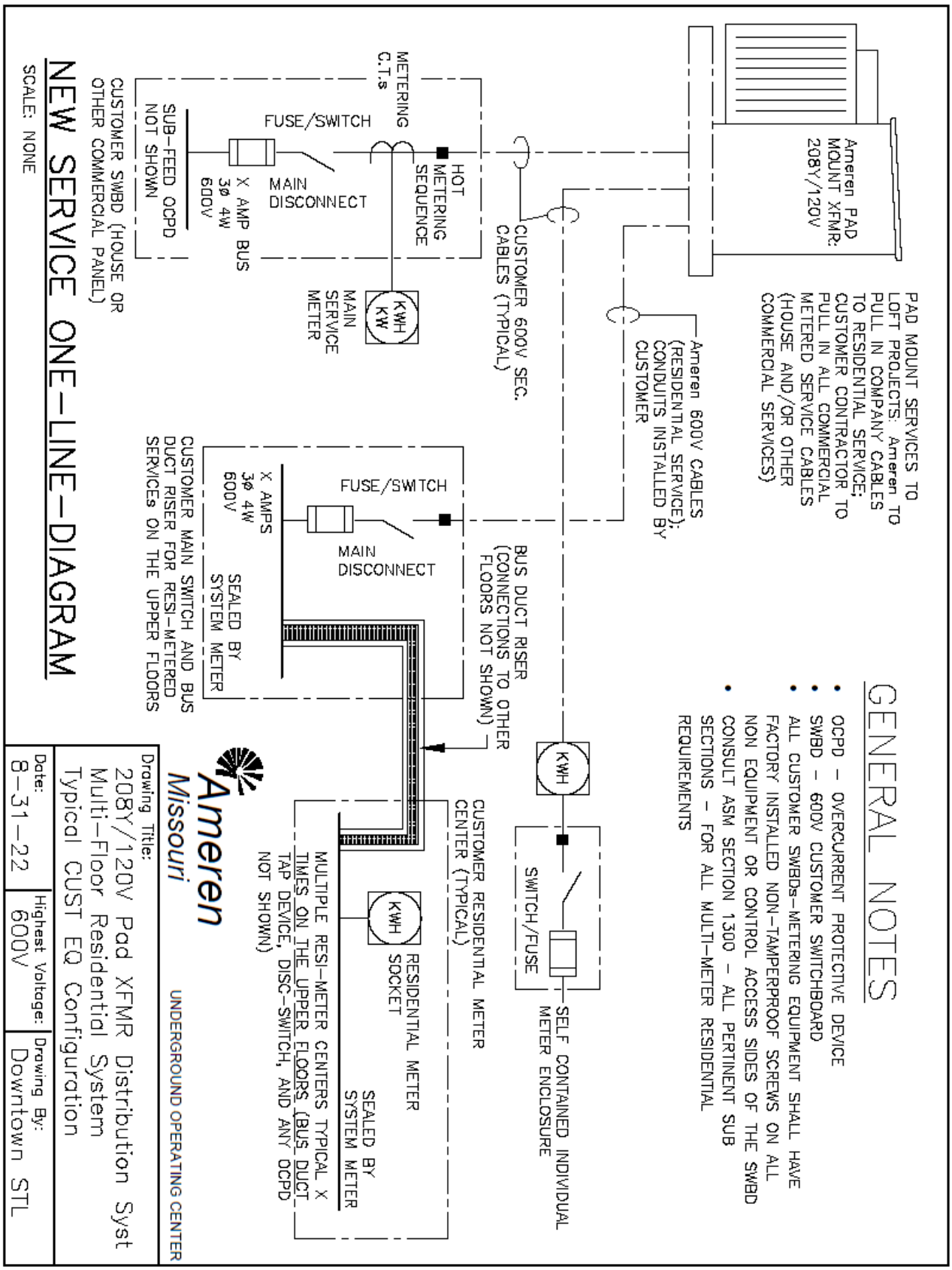


Network High–Rise Service EQ Configuration

Figure 1300–2A



Padmount Transformer High–Rise Service EQ Configuration
Figure 1300–2B



1350.01 GENERAL NETWORK AND HEAVY UNDERGROUND AREAS

Specific downtown areas of Bloomington, Champaign, Danville, Decatur, Galesburg, Normal, Ottawa, Peoria, and Urbana are designated as heavy underground and may consist of grid networks, and/or spot networks. Service restrictions are specific to their corresponding area(s) and the customer should consult the Company to determine the voltage and method of supply that will be available prior to beginning customer engineering or purchasing of equipment.

Service requests for structures where service does not exist shall be considered new business. Existing buildings or other structure renovations with new or upgraded loads, regardless of previous building loading or use – at the Company's discretion – shall be considered new business and subject to all requirements and restrictions within **ASM Section 1350**.

Relative to padmount services, equipment pads for transformers and switchgear shall be at grade elevation, on earthen soil, and fully clear of overhead obstructions for the entire equipment pad and working clearance area.

For Customer requested variances to any requirements within ASM Section 1350, Customer shall secure written approval for the variance from the Ameren Field Supervising Engineer of the appropriate operating center, irrespective of any verbal approvals. Variances shall not be considered valid or approved unless the variance is specific and provided in writing to Customer by Ameren.

1350.02 Heavy Underground Services

Services provided from heavy underground can deviate based on several criteria including existing facilities, local codes and ordinances, available voltages, and location. Below is general guidance for new services and Customer should contact a local representative for specific location requirements.

Service requests that have multiple meters or parallel sets of service cables to a premise will require the customer to install and maintain a service tap box. For Network Specific Services see **ASM Section 1350.04**. Tap boxes will be for Company access only and will have appropriate labeling identifying it as "Ameren Access Only" and will be locked by an Ameren supplied padlock. Tap boxes will meet local and national codes and sized for current and future loads.

For new services from an existing tap box, the customer will be responsible to install, maintain and coordinate all conduit and cable from existing tap box location to the meter. Company will make final connections within tap box. New services requested from a premise that already has a tap box may require the tap box to be upgraded. It will be the Customer's responsibility to provide and install all required materials to upgrade the tap box. This may also require additional work by Company to upgrade service conductors and conduit(s) to the tap box location.

For new services that are serviced from a Company owned manhole or service vault, the point of delivery will be the line side connections of either the tap box or meter base. For services supplied by a Company supplied pad mount termination cabinet, the point of delivery will be the load side connections of the buss bar.

It is the responsibility of the property owner or customer requesting service to provide all conduit and connectors on their property. Depending on location, Customer may be required to install conduit from Company service vault or manhole to customer's property, including work in public right of way. The Customer is required to contact the Company when working in Heavy Underground areas to determine who will be responsible for conduit installation in public right of way. If Company installs the conduit up to the property line, the Customer shall coordinate the location of where the Company's conduit and Customer's conduit will meet. Customer will be responsible to make sure conduit from both parties match the required number, size and type. Depending on potential growth or expansion, the Company may require spare or additional conduits.

Company will install and maintain cable up to the point of delivery.

1350.03 CUSTOMER INDOOR SUBSTATIONS

Relative to Customer requests for secondary metered service, where outdoor space is not available, when required by municipal ordinance, or required by other **ASM Section 1350** subsections, secondary metered service may be provided from a Customer indoor substation. The Company will provide Customer requirements and specifications for the indoor substation, and Company will install, own, and maintain primary switches, primary fuses, primary equipment enclosures, cables, and transformer(s).

Customer shall provide the indoor substation space, building elements, and any required easements in accordance with Company specifications and requirements. Customer is responsible for building elements that include, but are not limited to, the physical space with proper access for Company equipment to be installed/removed, all doors, oil retention system, grounding system, lighting and receptacles, equipment stands, access pits, grates, ladders, etc.

Customer shall contact the appropriate Company Region operating center a minimum of twelve months prior to the desired in–service date. This lead time is required to allow for Company/Customer engineering, equipment purchase, and construction.

Although the heavy underground and network areas are identified below in Ameren Illinois, indoor metering and any requirements as set forth in this section and **ASM Section 200** may be built within any building that is within the Company service territory, if approved by the Ameren Field Supervising Engineer and Field Metering Supervisor. Where space is available and meets Company requirements, outdoor padmount equipment (switchgear and transformer) is the preferred delivery method in these commercial and heavy underground areas.

1350.04 NETWORK AREAS and SERVICES

Several downtown areas are served from grid networks. For these specific areas, service from grid networks may be required. Service voltages are dependent on the grid voltage and Customer will be required to accept that voltage. Indoor substations may still be utilized in grid network locations.

A. Bloomington: Grid network voltage is 208Y/120V. Services will be limited to 1000kVA of peak utility demand. See **ASM Figure 1350-1** for grid network service area.

B. Decatur: Grid network voltage is 208Y/120V. Services will be limited to 1000kVA of peak utility demand. See **ASM Figure 1350-2** for grid network service area.

C. Peoria: Peoria grid network voltage is 480Y/277V. Grid network services provided at 480Y/277 require cold sequence metering (meter disconnect) for all instrument rated and self-contained metered services. Buildings with residential services will be required to use a step-down transformer to serve 120/208 volts 3-wire, grounded neutral "referred to as network metering" from the grid network 480Y/277V system and will be the responsibility of the property owner to install and maintain. See **ASM Figure 1350-3** for approximate grid network area.

Customers planning to take a network service from the downtown grid can take service by one of two service connection means:

1. Company network cables terminated at a Customer provided network tap box (see tap box spec drawings **ASM Figures 1350-4A &1350-4B**);
2. Company network cables terminated at a self–contained meter socket (exception for Peoria 480Y/277V network, cables would be terminated at the Customer's meter disconnect). See **ASM Section 200** for self-contained metering requirements.

If the network service connection involves multiple metered services at the same premise or requires parallel runs of service conductors, the Customer shall provide a network tap box, as specified in this section. New customer connections to the network distribution system, whether a completely new service or an additional service(s) to an existing network tap box, shall be reviewed and approved by the local Ameren Field Supervising Engineer prior to the start of any construction. For typical network service layout connections see **ASM Figures 1350-5 and 1350-6**.

Network tap boxes allow for multiple service connections from a single service point within a building and allows Ameren to install equipment on the service cables. Buildings that have multiple, or potential to have multiple, service connections will be required to be provide an approved Ameren network tap box, see **A S M Figure1350-4A and 1350-4B** for dimensions and specifications. The network tap box will be purchased and installed by the Customer. All connections made within the tap box will be made by the Company. Network tap boxes will be pad locked by Company and will have exclusive rights to enter the tap box, no Customer access within the box once installed. Network tap boxes location must be approve by Company before installing. All Conduit and building modifications (core drills or wall penetrations) will be the responsibility of the customer. New services requested from the network tap boxes will be the responsibility of the building owner or customer requesting the service to install all required conduit, cables, connectors between the network tap box and the new meter location. Company will make final connection within the network tap box. Network tap boxes can be located outside but will be the responsibility of the Customer to provide suitable location that meet all Company clearances and all local codes/ordinances.

Due to the possibility of networked distribution being exposed to high fault currents available when connected to the Company's downtown network distribution systems, the Company and the Authority Having Jurisdiction (AHJ) require the main service disconnection and current limiting overcurrent protection device (OCPD) to be adequate for the available fault current in these installations. This main service disconnect and over current protection will be required to meet the latest adopted NEC requirements for all customer service connections to the downtown network distribution systems. In multiple meter locations for residential units in these network systems, the customer will be required to balance their total building load across all three phases.

1350.05 COMMERCIAL / RESIDENTIAL HIGH−RISE MULTI−METER INSTALLATIONS

This section applies to high rise developments (refer to **ASM Section 150** for definition) where secondary service is provided by means of a padmount transformer or Customer indoor substation. **ASM Figure 1350-7** would apply for either a padmount transformer or Customer indoor substation installation. The padmount shown in **ASM Figure 1350−7** would be substituted with an indoor substation transformer. The following requirements shall be satisfied:

A. The customer provided distribution system configuration meets **ASM Figure 1350−7**.

B. Riser distribution voltage can be either 480Y/277 volts 3−phase 4−wire or 208Y/120 volts 3−phase 4−wire (a combination of the two voltage configurations for the residential services shall not be allowed).

C. Secondary metering voltages for commercial customers shall be 480Y/277 volts 3-phase 4-wire or 208Y/120V 3-phase 4-wire. Residential customers shall be 120/240 volts or 120/208 volts 3-wire, grounded neutral "referred to as network metering", at the point of metering. Only one service voltage for all residential in the same building.

D. Each floor's meter room shall have a dedicated disconnect that allows the metering equipment on the respective floor to be de−energized and locked out without having to de −energize the building (and all other upstream and downstream customers)

E. The property owner is responsible to maintain and replace as needed the step-down transformers that feed residential meters. Company recommends that the property owner maintain spare transformers in the event of an emergency.

F. Company reserves the right to review proposed Customer distribution equipment including, but not limited to, equipment sizes, configurations, disconnects, transformers, and metering equipment prior to Customer releasing the equipment for fabrication.

G. Customer should size their distribution equipment to appropriately mitigate potential voltage flicker and voltage drop issues.

H. All proposed metering equipment shall comply with the latest edition of the Ameren Electric Service Manual. Refer to metering requirements in **ASM Section 200**. All equipment within the metering spaces on the floors shall be identified with permanent phenolic labels to indicate the equipment ID and voltage, phase, and wire count; residential meters shall include phenolic labels identifying the apartment or condominium number.

I. Customer shall provide a detailed one−line diagram showing all proposed meter room equipment, equipment connection configurations, and equipment ampacity sizes. This can be shown on the building one−line or riser diagram.

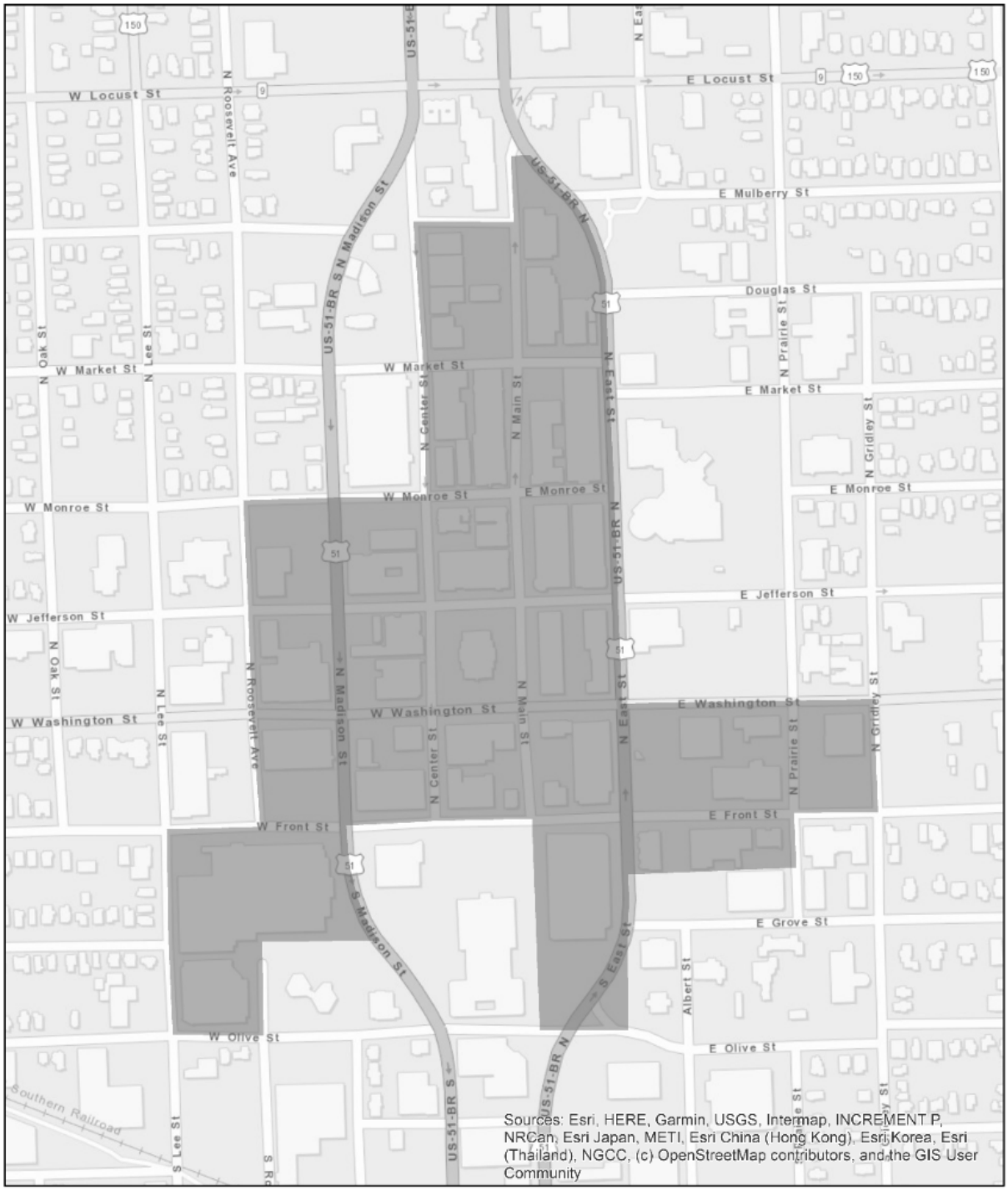
J. Refer to **ASM Section 200** for advance metering infrastructure (AMI) requirements.

K. All equipment within the metering room shall include provisions for metering seals or locks and side panels shall include tamper proof screws to prevent access.

L. Dry−type transformer/metering rooms shall not be used as a janitorial or storage closets. Other equipment can be installed in the rooms but access to metering equipment will remain unobstructed and all working clearances defined in **ASM Section 200** and all NEC requirements shall be met.

FIGURE 1350-1

Bloomington, IL Underground Network



1 inch = 400 feet

Legend

Bloomington, IL Underground Network

FIGURE 1350-2

Decatur, IL Underground Network

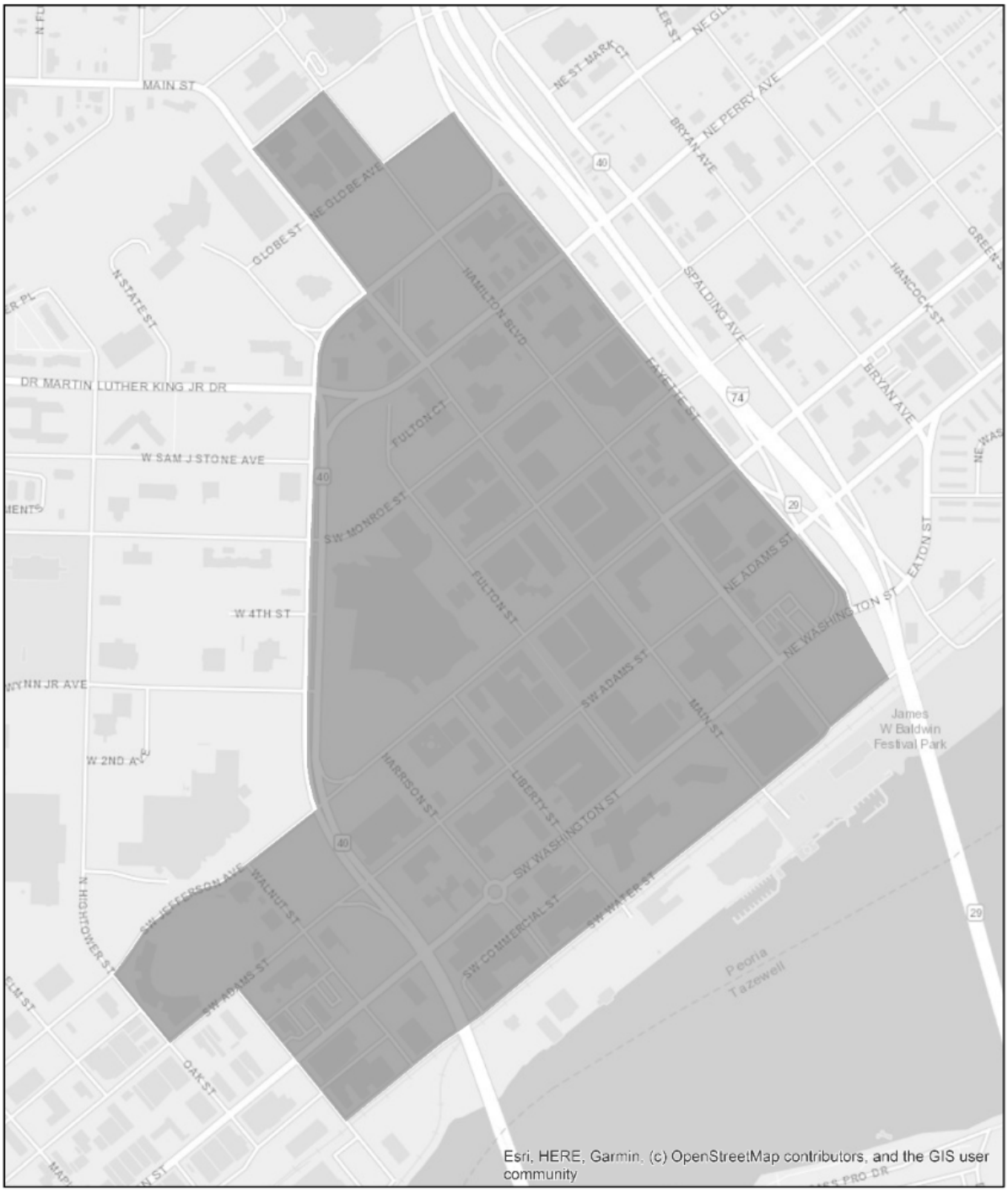
1 inch = 300 feet

Legend

Decatur, IL Underground Network

FIGURE 1350-3

Peoria, IL Underground Network



1 inch = 700 feet

Legend

Peoria, IL Underground Network

FIGURE1350-4A

GENERAL SPECIFICATIONS & REQUIREMENTS:

THE TAP BOX SHALL BE DESIGNED FOR CONTINUOUS OPERATION AT RATED VOLTAGE (< 600 VAC) AND AMPACITY

TAP BOX CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS AND CODES:
1) NFPA 70 NATIONAL ELECTRICAL CODE (NEC) FOR EQUIPMENT AND INSTALLATION
2) NEMA PB 2 DEADFRONT DISTRIBUTION SWITCHBOARDS
3) U.L. 50 CABINETS AND BOXES
4) U.L. 891 DEAD FRONT SWITCHBOARDS

TAP BOX BUS STRUCTURE SHALL BE OF SUFFICIENT CROSS SECTIONAL AREA TO MEET U.L. STANDARD 891'S TEMPERATURE RISE REQUIREMENTS.

BUS STRUCTURE SHALL BE THREE PHASE (3ø) AND FOUR WIRE (4W) CONSTRUCTION.

THE PHASE AND NEUTRAL BUS STRUCTURES SHALL BE HARD DRAWN COPPER, OF 98% CONDUCTIVITY. THE AMPACITY SHALL BE BASED ON A MINIMUM OF 1,000 AMPERES, RMS, CURRENT DENSITY PER SQUARE INCH.

THE BUS STRUCTURE SHALL BE BOLTED WITH GRADE 5 BOLTS, CONICAL SPRING WASHERS. WELDED CONNECTIONS SHALL NOT BE ACCEPTABLE.

THE BUS BARS SHALL BE THERMALLY RATED AND MECHANICALLY SUPPORTED FOR SHORT TIME FAULT WITHSTAND EQUAL TO A 3ø BOLTED FAULT AT A MINIMUM OF 100,000 AMPERES, RMS, SYMMETRICAL. THIS MINIMUM FAULT VALUE DOES NOT INCLUDE ANY FAULT CONTRIBUTIONS BY CUSTOMER MACHINERY, OR FAULT CURRENT ASYMMETRY. THIS SHORT TIME MAXIMUM WITHSTAND RATING IS BASED ON UTILITY FAULT CONTRIBUTIONS ONLY.

FOR 480Y/277V SERVICE APPLICATIONS, THE OEM SHALL CONFIRM THAT THE TAP BOX IS RATED FOR SUCH APPLICATION, INCLUDING ADJUSTMENTS TO THE PHASE BUS SPACING (AS REQUIRED) TO MEET UL, ANSI, AND NEC STANDARDS FOR 480Y277V UTILIZATION VOLTAGES.

THE TAP BOX SHALL BE FRONT ACCESS ONLY AND OF DEAD FRONT CONSTRUCTION.

THE TAP BOX FRAME SHALL BE OF FORMED U.L. LISTED GAUGE STEEL, RIGIDLY WELDED OR BOLTED TOGETHER TO SUPPORT ALL COVERPLATES, BUSSING, AND COMPONENTS DURING SHIPMENT AND INSTALLATION.

THE TAP BOX FRONT FRAME AND SIDES SHALL BE OF ONE PIECE WELDED CONSTRUCTION WITH ALL SEAMS GROUND SMOOTH. WHERE ACCESS PANELS ARE INSTALLED ON THE SIDES AND BACK, TAMPER PROOF (NON-REMOVABLE) SCREWS OR BOLTS SHALL BE INSTALLED. WHERE APPLICABLE, WEEP HOLES SHALL BE PROVIDED AT THE BOTTOM OF THE CABINET

THE TAP BOX ENCLOSURE SHALL BE PAINTED ON ALL EXTERIOR SURFACES. THE PAINT FINISH SHALL BE ANSI # 61 OR # 49 GRAY, OVER A RUST INHIBITING PRIMER, ON PHOSPHATIZING TREATED METAL SURFACE. PROVIDE A PAINTED SURFACE THAT CONFORMS TO IEEE C37.20.1 STANDARDS FOR METAL ENCLOSED LOW VOLTAGE POWER CIRCUIT BREAKER SWITCHGEAR, PARAGRAPH 5.2.8.

THE FRONT ACCESS DOOR SHALL BE REMOVABLE, WITH REMOVABLE HINGE PINS.

PROVIDE ADEQUATE VENTILATION TO THE TAP BOX SO AS TO NOT EXCEED INDUSTRY STANDARD TEMPERATURE RISE SPECIFICATIONS.

COMPLY WITH CURRENTLY ADOPTED VERSION OF THE ELECTRICAL CODE FOR FRONT SAFE WORKING CLEARANCES, REGARDING TAP BOX LOCATION AND INSTALLATION. A MINIMUM OF 6'-0" CLEAR SPACE IN FRONT OF THE TAP BOX SHALL BE PROVIDED TO ALLOW FOR PERSONNEL EGRESS, EVEN WITH THE DOOR OPEN. INSTALL TAP BOX IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

THE TAP BOX INSTALLATION SHALL BE PLUMB AND RIGID, WITHOUT DISTORTION OF THE TAP BOX. THE TAP BOX SHALL BE INSTALLED ON A CONCRETE HOUSEKEEPING PAD, MINIMUM PAD HEIGHT AT 6 INCHES.

THIS DRAWING/SPECIFICATION IS FOR REFERENCE ONLY; THE CUSTOMER'S ENGINEER SHALL BE RESPONSIBLE FOR THE FINAL DESIGN OF THE TAP BOX, WHICH SHALL CONFORM TO THIS LISTED MINIMUM SPECIFICATIONS AND REQUIREMENTS, HERE IN.

THE ORIGINAL EQUIPMENT MANUFACTURER (OEM) SUPPLYING THE NW (NETWORK) TAP BOX SHALL PROVIDE SHOP DRAWING SUBMITTAL DOCUMENTS FOR APPROVAL PRIOR TO FABRICATION OF THE TAP BOX. THE SHOP DRAWING SUBMITTAL SHALL INCLUDE SPECIFICATION DATA, U.L. LISTING AND OTHER RELATED CODE INFORMATION, AND PLAN VIEW AND FRONT AND SIDE ELEVATION VIEWS. ALL PLAN AND ELEVATION DRAWINGS SHALL HAVE ALL TAP BOX INTERNAL AND EXTERNAL ELEMENTS FULLY LABELED AND DIMENSIONED. IF ANY CHANGES ARE PROPOSED TO THIS SPECIFICATION PRIOR TO FABRICATION, THE CUSTOMER, THEIR AGENT, OR THE OEM, SHALL NOTE OR HIGHLIGHT ON THE SHOP DRAWINGS, THE PROPOSED CHANGES OR DEVIATIONS TO THIS SPECIFICATION FOR CONSIDERATION.

Ameren

Drawing Title:
NETWORK TAP BOX SPECIFICATIONS

Date: 12/15/21

Drawing By:

FIGURE 1350-4B

BUS STRUCTURE AMPACITY TABLE

NETWORK SERVICE CABLE CONFIGURATION TO TAP BOX	MINIMUM CONTINUOUS CURRENT ø BUS AMPACITY
1 – 2 NW CABLE/ø	1,000 AMPS
3 – 4 NW CABLE/ø	2,000 AMPS
5 – 6 NW CABLE/ø	3,000 AMPS

BUS CONTINUOUS CURRENT AMPACITIES UP TO 5000 AMPS SHALL BE ALLOWED; IF LOCAL CODE LOAD CALCS REQUIRE A GREATER BUS CAPACITY

Drawing Title:

NETWORK TAP BOX DIMENSIONS

Date: 12/15/21

Drawing By:

FIGURE 1350-5

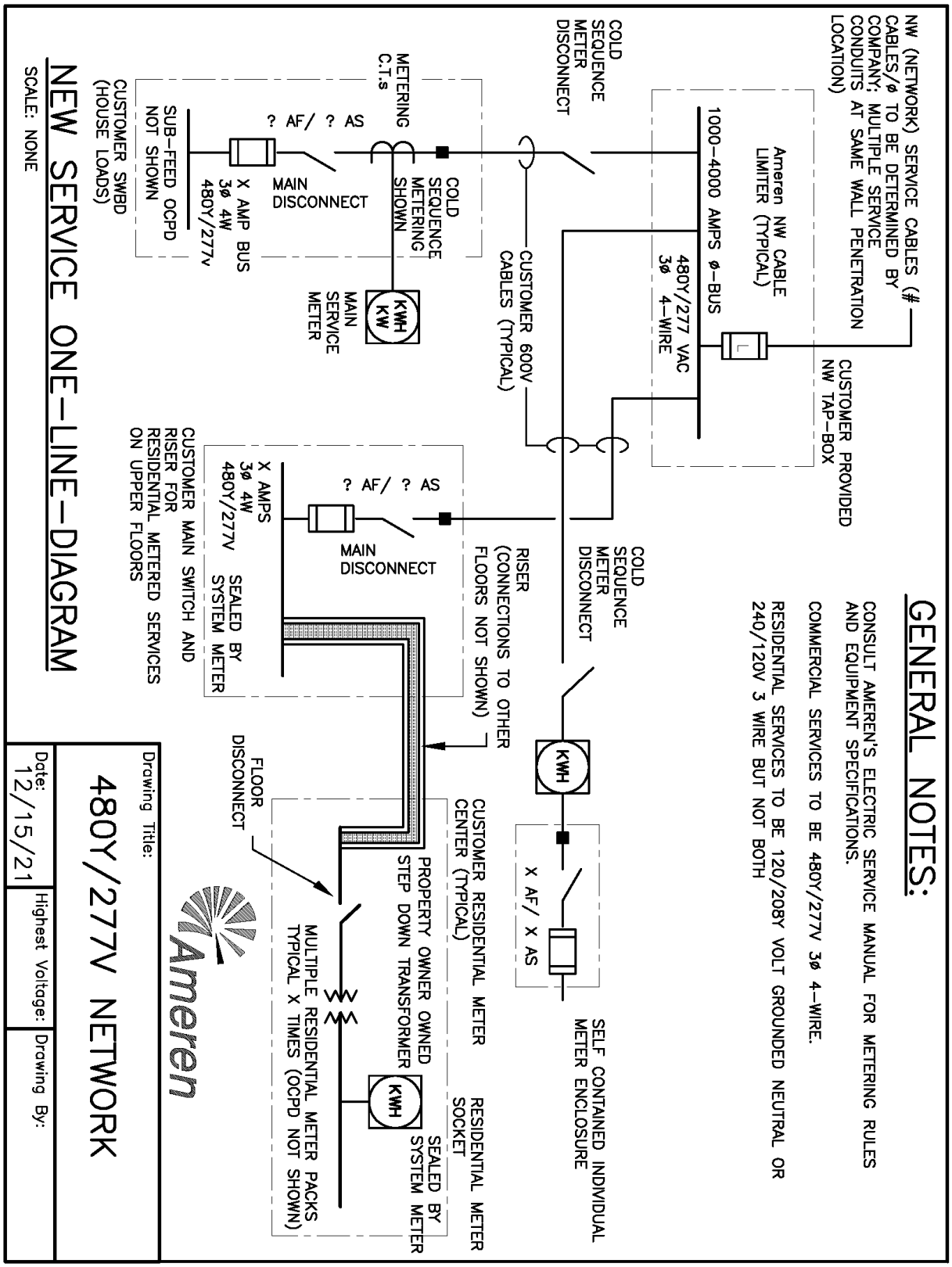


FIGURE 1350-6

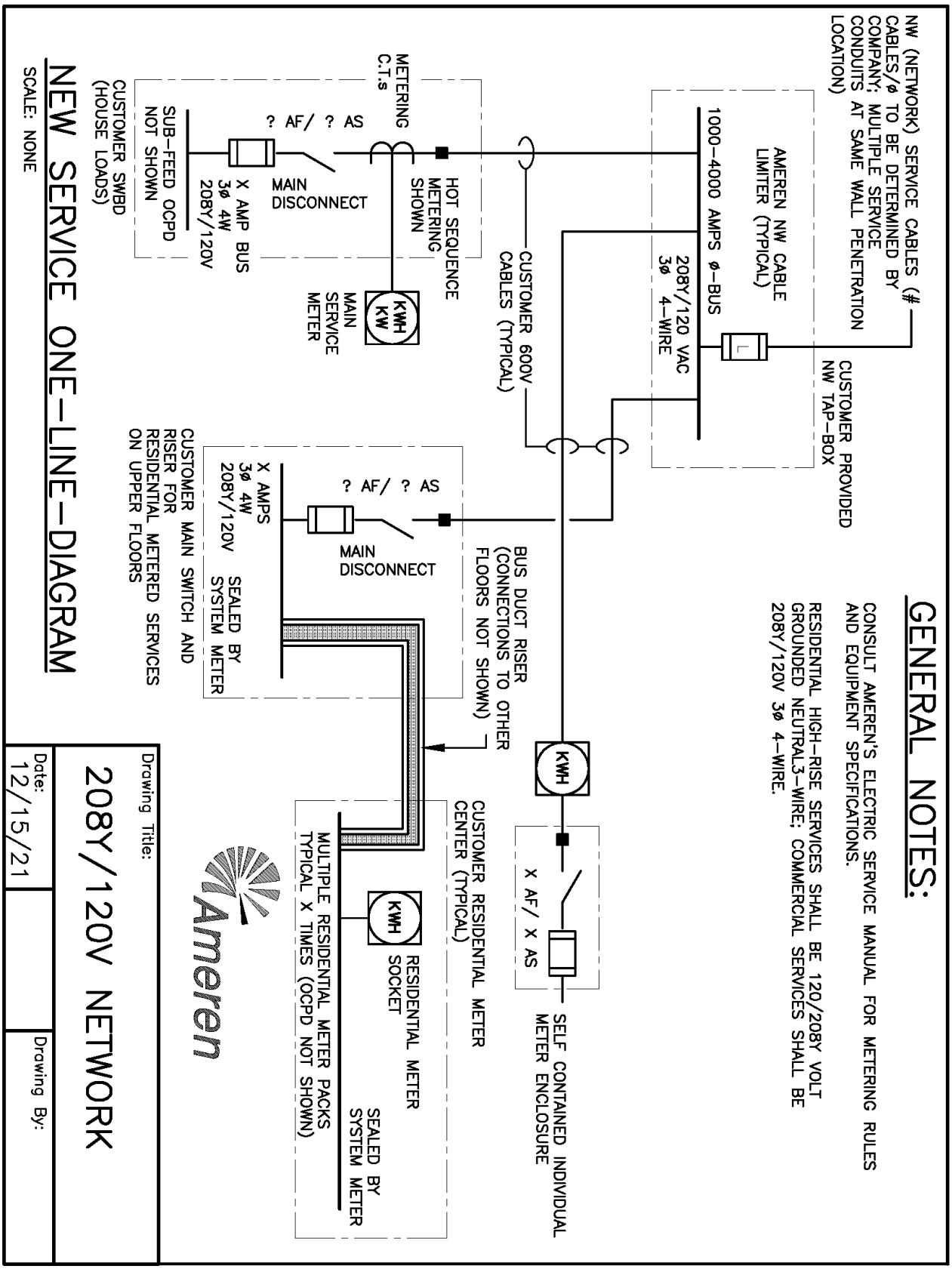
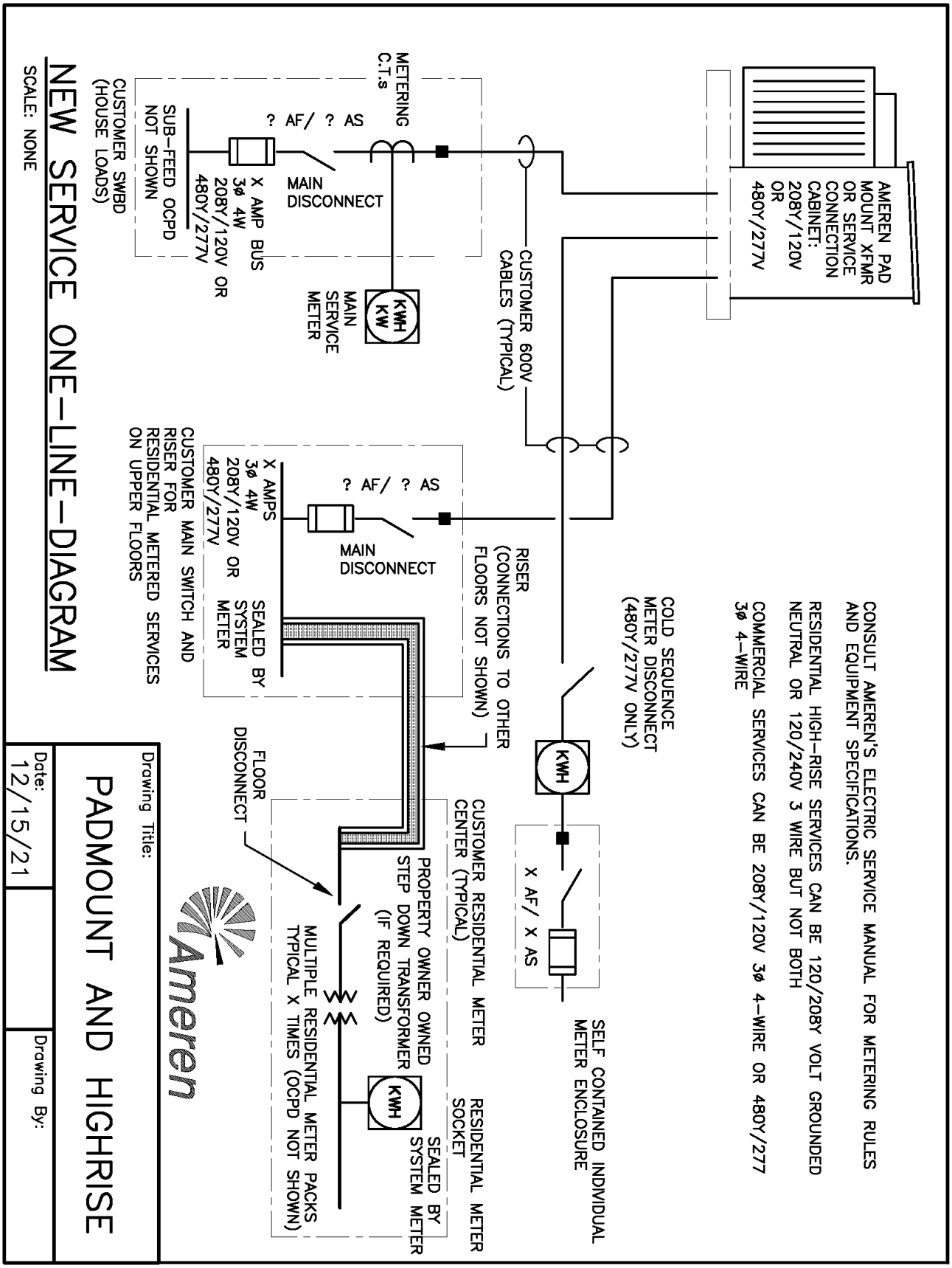


FIGURE 1350-7



1400.01 GENERAL REQUIREMENTS

1. Ameren is committed to both the safety of the public and its employees while maintaining reliable operation of its distribution system. Installations involving customer-owned and operated Distributed Energy Resources (DER) create the potential for serious personal injury as well as damage to the Customer's or Company's equipment.

2. In order to minimize potential dangers to utility employees and the public, all DER installations such as photovoltaic (PV), wind, energy storage systems (ESS), motor driven generators, or other systems shall adhere to UL 1741, IEEE 1547, and applicable requirements of the National Electrical Safety Code, the National Electrical Code, Institute of Electrical and Electronics Engineers (IEEE), Underwriters Laboratories(UL), Electrical Testing Laboratories (ETL), local electric codes, applicable NEMA codes, OSHA, AHJ, and Company's Electric Service Rules as set forth in published tariffs. A customer must make application to install DER through the Ameren Missouri Renewable Energy Program website:
   Link to Residential Customers
   Link to Business Customers

3. Anti-islanding protection is a way for the DER system to sense when the immediate utility supply circuit is disconnected from the remainder of the utility grid. This standard prevents the DER from injecting real or reactive power into an islanded utility supply circuit, thereby mitigating a potentially hazardous condition for utility workers and the public. However, this requirement shall not be construed to prevent the DER/ESS system from continuing to feed the customer's critical loads using automatic transfer switches, manual transfer switches, or mechanical interlocks to prevent back feed onto the utility grid.

4. For Behind -the-Meter (BTM) interconnections ≥ 200 kW, Ameren Missouri reserves the right to require a non-revenue production meter to monitor DER generation. For ESS systems with export capacity greater than 25 kW, Ameren Missouri reserves the right to require a revenue grade meter to monitor the output of the ESS to ensure that exporting ESSs are only charged by renewables (i.e., proper mode selection).

5. Careful selection of customer owned transformer and their protective equipment located on the load side of main disconnecting means must be made to prevent excessive overheating and to ensure detection of abnormal conditions such as Loss of Phase events, see **ASM Section 900**. The consequences of not detecting the Loss of Phase condition would be a violation of Standard IEEE 1547. Compliance with IEEE 1547 is required by Ameren Missouri for all customer with DER interconnections.

6. Customer's DER system must include a lockable AC generation source disconnect that is operable and can be locked in the "OFF" position by Ameren Missouri personnel, Customer, and emergency personnel. This disconnect switch will allow the DER system isolation from Company's distribution facilities for maintenance, reliability, and safety concerns. Any **HOLD OFF** tags or clearances given to the Customer's lockable AC generation source disconnect must be honored by Ameren Missouri personnel, the Customer, and emergency personnel. Refer to **ASM 1400.02.7** and **ASM 1400.02.8** for specific location requirements.

7. The lockable AC generation source disconnect shall be labeled by the customer with permanent placarding stating, **"LOCKABLE AC GENERATION SOURCE DISCONNECT".**

8. If the lockable AC generation source disconnect is greater than 10 ft from the revenue meter or not within sight of the revenue meter, additional permanent placarding stating **"CAUTION: MULTIPLE SOURCES OF POWER – LOCKABLE AC GENERATION SOURCE DISCONNECT AVAILABLE FOR ISOLATION FROM UTILITY**" shall be installed. It must also have additional verbiage to explain the exact location of the generation disconnect. Most times, there is a site overview map showing the facilities and identifying where the main service disconnect, and the AC generation source disconnect is located.

   A) Permanent placards must be engraved on hard plastic and adhered to the meter socket lid and lockable AC generation source disconnect with permanent adhesive or adhered to the building exterior surface immediately adjacent.
   B) Use of a label marker or glued-on strips is not acceptable.

9. For an ESS integrated with DER installations, all premises must have a lockable ESS disconnecting means on the AC side of the DER system for an AC coupled ESS or on the DC side of the DER system for a DC coupled ESS, or its remote control, located at

   1) a readily accessible location outside the building and

   2) within 10 feet of the Lockable AC Generation Source Disconnect(s) and maintaining visibility.

   The ESS disconnecting means shall be permanently placarded "**ENERGY STORAGE SYSTEM DISCONNECT**." or "**ENERGY STORAGE SYSTEM DISCONNECT – REMOTE CONTROL**" (if remotely actuated). The ESS disconnecting means must also have a permanent placard outlining the operating characteristics listed in the **2020 NEC 706.15(C)**.

10. For an ESS serving a critical load panel, an integral or external automatic transfer switch (preferred), manual transfer switch, or mechanical interlock that allows transferring from the utility source to the DER/ESS system and vice versa must be installed. This transfer switch allows Ameren to disconnect utility power to the inverter by operating the lockable AC generation source disconnect for completion of the witness test without interrupting power to the critical load panel. If the customer elects to install an ATS, the normal source should be utility grid power. If a manual transfer switch or mechanical interlock kit is used, then the critical load panel must be served by utility grid power until the witness test is completed. After the completion of a successful witness test, the customer or installer should swap the manual transfer switch or mechanical interlock kit over to the normal feed is from the inverter AC output.

11. If a PV installation is served by more than one lockable AC generation source disconnect, then each disconnect must have a permanent placard depicting an aerial view of the location (including the boundaries of the respective PV panel systems) and the location of all lockable AC generation source disconnects. This placarding must identify how to de-energize a particular section of PV generation to ensure the safety of personnel working around the PV system and emergency responders. Additionally, each PV panel system shall have uniquely identifiable permanent placards matching the respective lockable AC generation source disconnect.

12. Customer DER systems must include appropriate wiring and metering equipment if the customer wants to sell or receive credit for excess electricity generated by the DER being injected back into the Ameren Missouri electric distribution system. The customer must file an application, including a detailed one-line diagram (when applicable), so that the process for interconnecting a proposed DER installation can begin.

13. Sales of electricity are regulated by various state and federal agencies, and it is the customer's responsibility to investigate all state and federal agency requirements before filing an application.

1400.02 SPECIFIC REQUIREMENTS

1. Customer DER systems shall be installed according to the manufacturer's instructions.

2. Customer is responsible for protecting their generator's equipment in such a manner that faults or other disturbances on the Ameren Missouri electric distribution system or on Customer DER system do not cause damage to their equipment.

3. Customer shall furnish information to Ameren Missouri regarding their proposed generation equipment and protective devices prior to parallel operation. Company will check the adequacy of this proposed equipment and its compatibility with protective devices on the Company's system and will either approve as submitted or specify additional equipment which will be required to begin parallel operation with the Company's system.

4. Per the Ameren Service Manual, any work or wiring changes at the service will prompt the need to upgrade equipment to the latest service manual requirements, including but not limited to installing a lever bypass meter socket or CT enclosure.

5. Meter sockets and metering equipment enclosures are not to be used as junction boxes or raceways for customer owned distribution circuit wiring or alternate power source(s) circuitry and monitoring equipment. Only service entrance conductors are permitted in those metering enclosures. Once service entrance conductors leave the meter socket or metering equipment enclosure(s), they cannot re-enter the enclosure for any reason. Customer owned CTs and cabling used to monitor their loads and / or DER production output are not allowed inside the meter socket or metering equipment enclosures. Unauthorized wiring and equipment shall be removed by the customer at no expense to Company.

6. Customer's lockable AC generation source disconnect switch shall comply with the following:

   a) One of the following types

      1) Manual operable switch or circuit breaker

      2) Load-break-rated pull-out-switch

   b) Simultaneously disconnect all ungrounded conductors of the circuit.

   c) Located outdoors where readily accessible.

   d) Enclosures with doors or hinged covers that are readily accessible to unqualified persons and have exposed live parts when the enclosure is opened must be secured in a manner that requires a tool to open the enclosure or must be lockable.

   e) Disconnect mechanism must be padlockable in the open (OFF) position.

   f) Plainly indicate whether in the open (OFF) or closed (ON) position.

g) Have ratings sufficient for the maximum circuit current, available fault current, and voltage that is available at the terminals.

h) Be marked with a warning when the line and load terminals are capable of being energized in the open position.

i) The lockable AC generation source disconnect switch must be within reach, with a maximum mounting height with the handle no higher than 6'7" above grade when in the "UP" or ON position.

j) When the lockable AC generation source disconnect is a knife-blade safety switch (fused or non-fused), the conductors coming from the DER system must terminate on the bottom lugs of this disconnect. Utility supply will terminate on the top lugs of this disconnect.

k) When the lockable AC generation source disconnect is a Circuit Breaker, the utility supply shall terminate at the ON side lugs of the breaker. The conductors coming from the DER system shall terminate at the OFF side lugs of the breaker.

7. **A LOAD SIDE TAP** is when the DER connects downstream of the customer's main service disconnect. The lockable AC generation source disconnect will be located outdoors, readily accessible, within 10 ft of the electric revenue meter, and between the inverter and a circuit breaker or fuse (overcurrent protection device - OCPD) located in the main distribution panel. This disconnect switch may or may not have overcurrent protection in this device. The maximum size of the proposed DER system is limited by the main service disconnect ampere rating, associated bus rating, and overcurrent protection device rating. Taking these values into account, the **maximum size** of the DER system can be calculated per NEC requirements. The lockable AC generation source disconnect switch must have an equipment grounding conductor that originates at the main service disconnect and terminates on the enclosure

   The lockable AC generation source disconnect switch *may* have the following depending upon system configuration:

   a) System neutral

   b) Overcurrent protection

8. **A LINE (SUPPLY) SIDE TAP** is when DER interconnections are made between the customer's main service disconnect and Ameren's metering instruments or self-contained meter. A Line Side Tap requires a DER Main Disconnecting Means with overcurrent protection, similar as the Main Service Disconnecting Means. In some cases, the DER Main Disconnecting Means may also serve as the lockable AC generation source disconnect switch. When the lockable AC generation source disconnect is located downstream of the DER Main Disconnecting Means, the lockable AC generation source disconnect switch may or may not have over-current protection in this device. The lockable AC generation source disconnect must be outdoors, readily accessible, and mounted within 10 feet and in sight of the electric revenue meter and within 4 feet of the POI. If this distance cannot be maintained – consult with your Ameren representative. The size of the proposed DER installation is limited by the ampere ratings of the service entrance conductors, metering equipment, and other service equipment ratings.

9. **LINE (SUPPLY) SIDE TAP POINT OF INTERCONNECTION (POI)** must comply with the following requirements:

   a) Conductors running from the POI to the DER Main Disconnecting Means and overcurrent protection device shall be no smaller than #6 AWG copper or #4 AWG aluminum.

   b) The conduit running from the POI to the DER Main Disconnecting Means shall contain only DER service entrance conductors. Monitoring cables and other customer circuitry are not permitted.

   c) If the customer chooses to install a production meter, it must be located after the DER Main Disconnecting Means (e.g., on the generator side).

   d) Where the DER circuit makes a POI outside of a building or at a meter structure (OH or UG), it shall be protected by an overcurrent device(s) at a readily accessible location outside the building, near a meter structure, or where the DER conductors enter the building. The overcurrent protection device shall be located within one of the following criteria:

      1) 15 ft of total conductor length from POI for dwelling units,

      2) 20 ft of total conductor length from the POI for meter structures,

      3) 20 ft horizontally or 30 ft of total conductor length (if bends are required) from the POI for buildings which are not considered to be dwelling units.

      *If current limiters are installed, the total conductor length can be extended by up to 41 ft for each category above, but in no instance shall unprotected conductors extend more than 10 ft into a building.

   e) Where the DER installation makes its POI to a service inside a building, they shall be protected by one of the following methods:

      1) with an overcurrent device located within 10 ft of conductor length in dwelling units and

         16.5 ft in other than dwelling units from the point of connection to the service.

      2) in other than a dwelling unit, with an overcurrent device located within 71 ft of conductor length from the point of connection to the service, if cable limiters installed in all ungrounded conductors are located within 16.5 ft of conductor length from the point of connection to the service.

      3) The DER overcurrent protection and associated supply conductors shall be sized to carry 125 percent of the rating of the sum of the DER sources.

   f) For connections rated 1000 amperes or more to solidly grounded wye services exceeding 150 volts to ground but not exceeding 1000 volts, phase-to-phase, ground-fault protection that meets the requirements of the NEC must be provided.

g) When interconnecting with existing 3-Ph 3-Wire ungrounded services, ground detection sensing equipment must be installed by the customer on existing service equipment and the new AC generation source service equipment. See **ASM Section 500**.

h) POI can be made in a junction box, trough, or tap box after the metering equipment but before the main service disconnect. DER POI must be made using listed connectors and comply with NEC enclosure fill requirements. All power distribution blocks installed on service conductors shall be marked as "Suitable for Use On line Side of the Service Disconnect." Effective January 1, 2023, pressure connectors and devices for splices and taps installed on service conductors shall be marked as "Suitable for Use On line Side of the Service Disconnect." **2020 NEC 230.46**.

i) Self-contained Meter Socket POIs:

1) 200 amp Ameren Revenue meter socket - The POI connection can be made in some Ameren revenue 200 amp meter sockets. The meter socket must be in good working order and lever bypass style. Presently, Milbank is the only mfg. that has a UL rated tap accessory kit that works only in their products. This kit allows the installer to replace the existing slide-in nut assembly of the factory lay-in lug with a new slide-in nut assembly that has a lug allowing for a 100 amp tap in addition to the normal lay-in lug designed to accommodate #6-350 kcmil conductors.

2) 320 ampere/400 ampere max Ameren revenue meter socket – The POI connection can be made in this meter socket provided there are not more than 2 barrels per lug bolted onto the connector stud. Many of the factory lugs for this style of meter socket have non-rotating twin barrel lugs that accommodate #6 – 350 KCM conductors. These mfg. load side lugs must not be swapped out for different style such as stacked or stair-stepped lugs to accommodate extra conductors.

j) CT Rated Services Installations – POI connections are not allowed inside CT enclosures.

k) POI inside Ameren Missouri meter socket or CT enclosure will not be allowed in existing installations if this metering equipment is not deemed by Ameren Missouri to be in good condition and an acceptable POI method for the installation.

l) Insulated connectors such as those manufactured by NSI and ILSCO (IPCS, Nimbus, Polaris) used for making a multi-tap or insulated piercing connectors are not allowed to be used inside meter sockets or CT enclosures for making a POI.

m) When the POI is made within a line-side junction box or on the line-side conductors within a main service disconnect fed by multiple runs of service conductors using insulated connectors [such as those referenced in item l.)], the POI must intercept all runs.

n) Non-insulated connectors (ex. ILSCO PTT-2L-250-Z flag connectors) are not allowed to be used to add termination barrels inside meter sockets or CT enclosures for making a POI.

o) POI is not allowed to be made at the Ameren transformer lugs, even when customer revenue CT instruments are presently inside the padmount transformer.

p) When making a POI, if any portion of the supply conductors/cable must be re-routed (such as installation of a junction box/terminal box) or lengthened, then the service installation must be upgraded to meet the current Ameren Electric Service Manual specifications, including relocating metering instruments and meter socket from the Ameren transformer to customer owned metering enclosures per Ameren policy found in **ASM Section 1001**.

q) An alternate location to consider for making a POI if it cannot be made inside the revenue meter socket or CT enclosure is a customer installed NEMA 3R tap box between the meter socket and the main service disconnect.

r) POI is allowed to be made inside Customer's Main Service Disconnect where space allows.

s) CT enclosures cannot be used as a junction box or raceway to route DER conductors and supporting DER hardware (i.e.: customer owned monitoring CTs or cabling)

t) In some cases, the existing supply conductors running from the padmount transformer/ secondary pedestal/pole to the supply side of CT rated services may have a lower ampacity rating than the main service disconnect. Additionally, some existing customer owned, residential, single phase service entrance conductors for 100 amperes through 400 ampere installations were sized with reduced conductor ampacity as allowed by **NEC 310.12**. When making a line side tap, it should be verified that the supply conductors / service entrance conductors are properly sized for the proposed DER system. If the conductors are undersized, the customer must install new service entrance conductors at their expense from customer service equipment to the utility service delivery point.

u) When making a line side tap where the DER Main Disconnecting Means will be mounted on a separate structure from the service installation and these structures are not mechanically secured together to function as a single structure, then the supply conductors from the POI at the service installation to the DER Main Disconnecting Means must be run underground in a conduit system.

For a main service disconnect & DER Main Disconnecting Means mounted on separate structures, the DER Main Disconnecting Means must be mounted on a building or galvanized metal structure like as shown in **ASM Section 700**.

10. When making a Line (Supply) Side Tap from a service installation that is served from a grounded secondary utility system, the DER Main Disconnecting Means must have the grounded (neutral) conductor ran from the POI, even if Customer DER system does not require the grounded (neutral) conductor.

1400.03 SINGLE-PHASE DER INTERCONNECTION LIMITS

A. Single-phase Behind-the-Meter (BTM)

1. For single-phase DER connected line to center tap neutral of a 120/240 volts service (e.g., 120 volts line-to-neutral), its addition (or aggregate addition) may not create

an imbalance between the two sides of the 240 volts service of more than 20% of the nameplate rating of the service transformer. This same 20% limitation would apply to a 240/480 volt single-phase service (e.g., 240 volts line-to-neutral).

2. For single-phase DER connected line to neutral on a three-phase grounded wye system, the maximum aggregate DER size would be 20% of the nameplate of one of the single-phase transformers in the bank, or 20% of 1/3 of the nameplate of a unipot* transformer.

3. For DER connected line-to-line on two phases of a three-phase grounded wye system, the maximum aggregate DER size would be 40% of the nameplate of one of the single-phase transformers in the bank, or 40% of 1/3 of the nameplate of a unipot* transformer.

4. For single-phase DER connected line-to-line on a three-phase delta system, the maximum aggregate DER connected line-to-line on the lighting transformer would be the difference of the ratings of the lighting transformer and one of the power transformers. If the single-phase DER is connected only line-to-neutral, the maximum aggregate size would be 20% of the line- to-line rating, or 20% of the single-phase rating of the lighting transformer.

5. Single-phase (line-to-neutral) aggregate DER connected to a three-phase system should not exceed 10kVA. Two-phase (line-to-line) aggregate DER connected to a three-phase system should not exceed 20kVA. Both limits apply to three-phase grounded-wye and delta center tap grounded configurations.

6. For floating delta and corner grounded delta secondary systems, only balanced three-phase connections will be allowed. This can be achieved by using a three-phase inverter or by banking line-to-line connected inverters.

*A unipot transformer is a transformer that contains all three phases within the same tank. This includes both overhead and padmount transformers.

**Aggregate DER refers to the sum of all such DER installations connected in the same manner to a common transformer.

B. Three-phase Behind-the-Meter (BTM)

1. For three-phase BTM DER interconnections that are served by an Ameren owned open-wye or open-delta transformer primary configurations to supply a three-phase service voltage, the maximum nameplate capacity of three-phase DER that can be connected is limited to 144% of the kVA rating of the smallest transformer.

2. For proposed BTM DER that exceed the limit in the paragraph above, if there are three primary voltage phases readily available, the service transformers should be replaced with a three-transformer bank or a single three-phase transformer to maintain phase balancing. Charges may apply to complete this upgrade. If the upgrade requires that the customer's total main size exceeds 600 A, the customer will be required to convert to one of the standard three-phase service voltages shown in **ASM Section 400**.

1400.04 DER INTERCONNECTION PROCESS REQUIREMENTS

Any customer requesting to connect DER – i.e., photovoltaic (PV), wind, energy storage systems (ESS), motor driven generators, etc. – for the purposes of net-metering (not emergency or stand-by generation) shall comply with the following requirements as a condition of service, in additional to the standard requirements for service. All service metering voltages will meet the standard voltages stated in **ASM Section 400**. Where non-standard service voltages exist, Ameren may allow DER interconnection at Ameren discretion.

The customer will comply with all Ameren Missouri Company general requirements for DER interconnections that are in the applicable Missouri Administrative Code, Ameren's Standards and Qualifications for Electric Service, and the Ameren Electric Service Manual. A customer must make application to install DER through the Ameren Missouri Renewable Energy Program website:

Link to Residential Customers.

Link to Business Customers.

Please email inquiries to amerensolar@appliedenergygroup.com

Prior to being given **Permission to Operate (PTO)**, all installations must pass an Ameren Missouri administered witness test per the interconnection agreement.

On multi-phase BTM systems interconnected with service installations that are fed by dedicated Ameren secondary facilities, Ameren ***may*** be able to complete loss of phase witness testing using Ameren equipment.

On multi-phase BTM systems interconnected with service installations serving critical loads or when Ameren secondary facilities serve multiple customers, the developer/installer shall provide a means to complete loss of phase (single-phase) testing on the load side of the main service disconnect. The developer/installer shall declare how they will facilitate the loss of phase testing on the one-line diagram submitted with all applications. The one-line diagram must point to

permanently installed facilities to be used for loss of phase witness testing, or when temporary equipment is to be utilized, the rating of such equipment shall be listed, and the equipment shall be shown in an inset off to the side of the permanent one-line indicating the location where the temporary equipment will connect. Ameren may provide feedback on the developer's/installer's loss of phase witness testing procedure and require modifications considering customer sensitivity and operation.

The proposed DER installation connected to Ameren Missouri shall meet the requirements mentioned in Table 1.

Table 1 - Summary of Inverter Standards / Guidelines

References	Description
IEEE 1547-2018	SMART Inverters connected to the Utilities systems shall be rated as IEEE 1547-2018 compliant
UL 1741	SMART inverters connected to the Utilities systems shall be rated as UL 1741 safety compliant

Table 2 - Distributed Energy Resource (DER) Interconnection Applications (Application Levels as of 5/25/2022)

Level	Description
1	Lab-certified inverter-based interconnection equipment with an aggregate electric nameplate capacity less than or equal to 50 kVA and a maximum export capacity of 25 kVA.
2	Lab-certified interconnection equipment with an aggregate electric nameplate capacity greater than 25 kVA and less than or equal to 2.5 MVA.
3	DER connections to the Ameren grid or spot network distribution system shall be considered Level 3 requests. For radial distribution circuits, the aggregate export capacity of all generation (existing and proposed) on the circuit must be no greater than 10 MVA or less than or equal to 10 MVA if connecting to a radial primary distribution feeder.
4	Nameplate capacity rating is less than or equal to 10 MVA and the distributed generation facility does not qualify for a Level 1, Level 2, or Level 3 review, or the distributed generation facility has been reviewed but not approved under a Level 1, Level 2, or Level 3 review.

For Level 2 and Level 4 BTM DER interconnections that require Ameren Missouri planning analysis requires system upgrades: Metering interval data, provided by Ameren Missouri, will be required for at least one year, or if the customer is new, detailed operating load information will be required to be provided by the customer for proper transformer and other Ameren Missouri equipment evaluation (sizing and charges). If larger equipment is required to serve the DER than is required to serve the load, the customer will be required to pay the difference without the benefit of delivery service revenue credit. A functional one-line must be submitted by the customer to enable Ameren Missouri to perform the analysis.

Due to operational complexities of network protectors found on the secondary spot and grid network systems, Level 3 interconnections **SHALL NOT** export (back feed) power on the Ameren Missouri network distribution system. It is the customer's responsibility to install appropriate equipment to ensure the DER installation will adhere to the **NO EXPORT** criteria of the Interconnection Agreement with Ameren Missouri. As part of the Level 3 process, Ameren Missouri must conduct a thorough engineering review of the DER interconnection application that requires interval demand information from the customer for the previous 12 months. If Ameren Missouri does not have the interval demand history, the customer will be responsible for all costs to install an advanced revenue metering package to obtain this data.

Access to Premises

Ameren Missouri may enter Customer's premises without prior notice:

1. to inspect at all reasonable hours Customer's DER and protection devices and read or test any meter for the Facility.

2. to disconnect, at any time, without notice, the Facility if, in Ameren Missouri's sole opinion, a hazardous condition exists and that immediate action is necessary to protect persons, or Ameren Missouri's facilities, or property of others from damage or interference caused by

   a) Customer's Facility or

   b) Customer's failure to comply with the requirements of this Agreement

3. to read monthly the bidirectional digital meter for billing purposes. Self-reads and reads from adjacent properties are not permitted.

1400.05 METERING

1. Parallel generating facilities connected to Company's system are divided into two groups:

   a) No-exporting DER would apply to Customer's facilities whose load is significantly larger than their generating capacity so that no Customer-generated power would flow into Company's system except under fault conditions. This metering scenario also applies to DER systems that are not allowed to export due to interconnection with Company's secondary spot and grid networks.
   For non-exporting DER, the AC generation source disconnect or associated circuit breaker will be tripped by equipment capable of detecting the reverse power flow condition toward Company's system. This type of installation requires a single revenue meter installation with detent to prevent operation of the meter in the reverse direction.

   b) Export capable DER would apply to Customer's facilities whose load is sufficiently variable or smaller than its generating capacity so that excess Customer-generated power could flow into Company's system. (Exporting Generation)
   For export capable DER, the revenue metering shall include a bi-directional meter (commonly referred to as the "net metering"). The meter will be capable of measuring

kWH in both directions; one register indicating kWH to the customer from Ameren Missouri and a second register indicating kWH to Ameren Missouri from the customer.

2. Metering equipment shall be Ameren approved. Refer to the Ameren Approved Metering Equipment List, which can be found at BuildWithAmeren.com.

1400.06 AMEREN WITNESS TESTING

1. The Customer understands that Ameren ***may*** conduct a witness test of the distributed energy resource (DER) facility, from the point of interconnection to the Lockable AC Generation Source Disconnect and from the point of interconnection to the Energy Storage System (ESS) Disconnect, to ensure that all equipment has been appropriately installed and that all electrical connections have been made in accordance with the applicable codes.
2. The Customer further understands that Ameren ***may***, but is not required to, identify wiring and electrical equipment practices that may raise safety and/or reliability concerns for Ameren and/or the Customer on the Customer's side of the point of interconnection. Ameren reserves the right to identify safety and/or reliability concerns prior to or during witness testing that could lead to the witness test being suspended or a delay in the issuance of permission to operate (PTO) until corrections are made.
3. To the extent that Ameren does identify wiring and electrical equipment practices that may raise safety and/or reliability concerns for Ameren and/or the Customer on the Customer's side of the point of delivery, the Customer understands that said identifications are not being made by certified inspection authorities and should be verified by a certified inspector and/or local governmental authorities.

1400.07 TYPES OF INVERTER INSTALLATIONS

A **Smart Inverter** is a device that converts direct current into alternating current and can autonomously contribute to grid support during deviations from normal operating voltage and frequency conditions by providing each of the following: dynamic reactive and real power support, voltage, and frequency ride-through, ramp rate controls, communication systems with ability to accept external commands, and other functions from the electric utility.

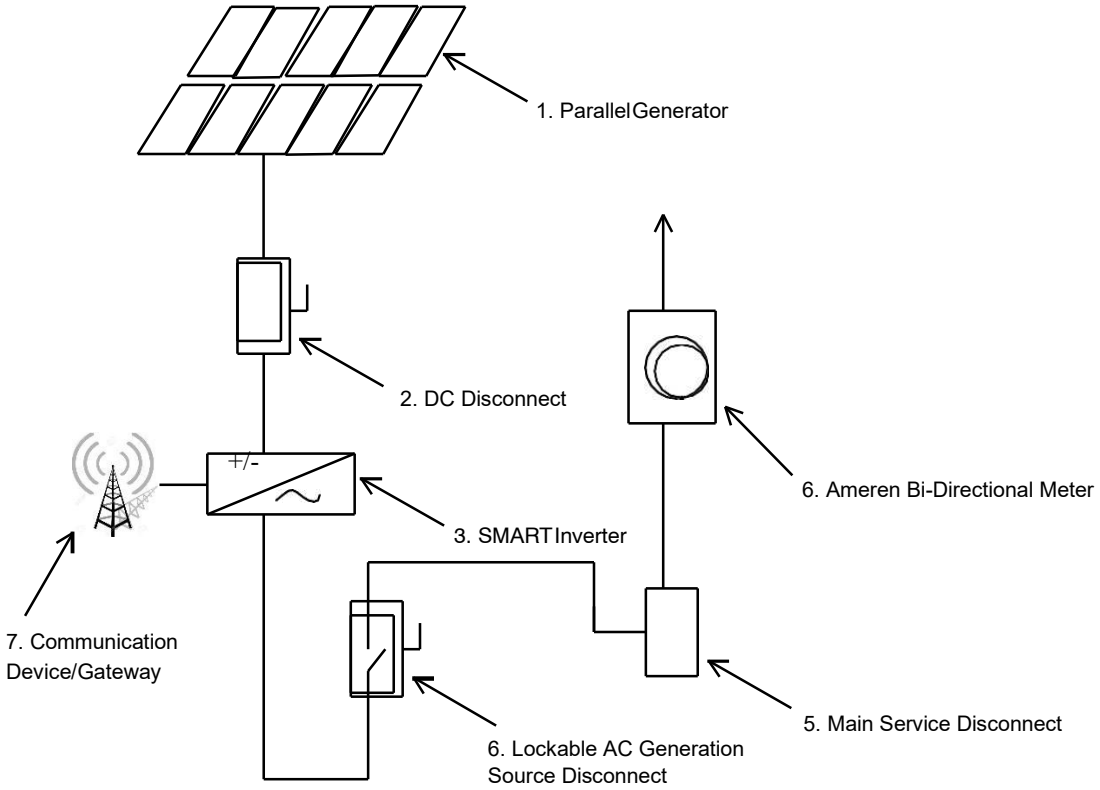
Smart Inverters are distinguished from inverters without smart capabilities in three ways:

1. They can modify their real power (Watts) and reactive power (VARs) output to provide grid support.

2. They can respond autonomously to voltage/frequency changes.

3. They can respond to communication signals.

Figure 1400-1 One-Line Diagram - Smart Inverter Connection



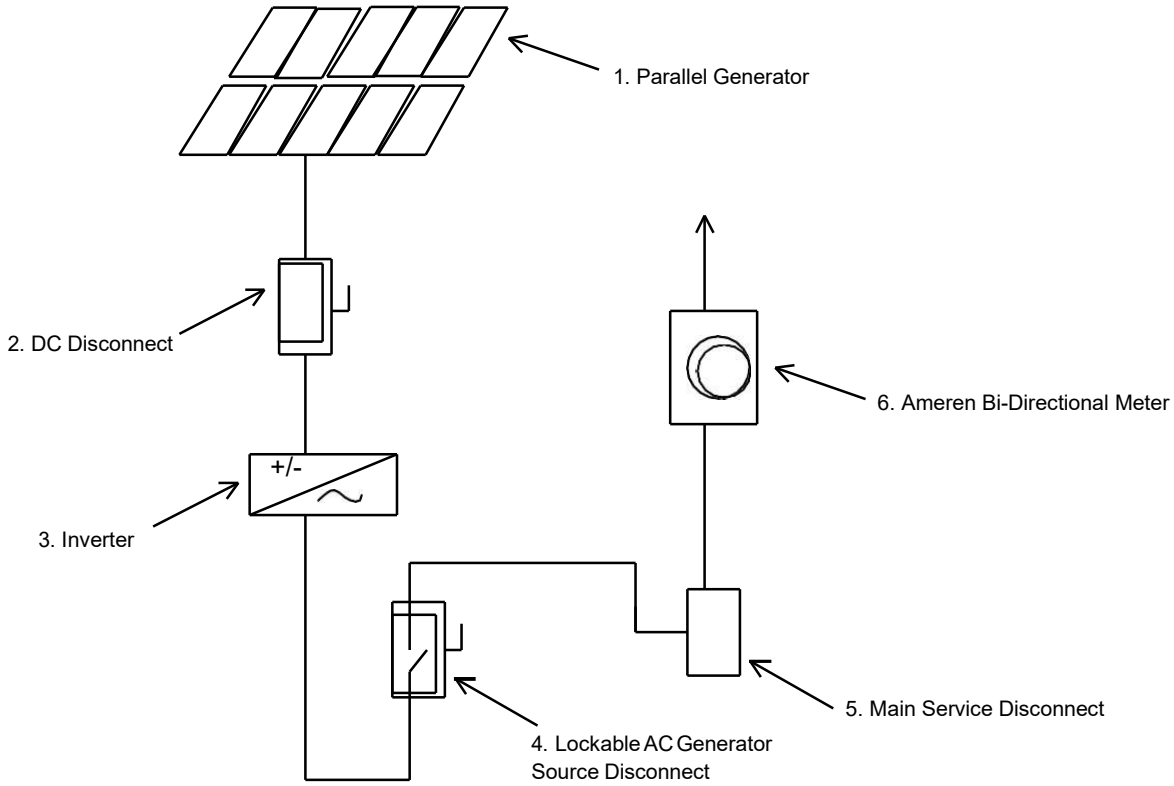
Customer Furnishes, Installs, Maintains:

1. Interconnected DER connected in parallel with Ameren
2. DC Disconnect switch for generator:
    a) Some Inverters may integrate a lockable disconnect switch with inverter, which may eliminate the need to install additional equipment if located outdoors.
    b) When a DER system includes an ESS, Ameren Missouri does not require a DC disconnect.
3. Inverter shall meet the certification requirements listed in the Smart Inverter Specification attached to be labelled as IEEE 1547/UL 1741SA or UL 1741SB listed
4. Outdoor Lockable AC Disconnect located within 10 ft of revenue meter (exceptions may apply to distance).
5. Main Service Disconnect

Ameren Missouri Furnishes, Maintains, & Controls:

6. Utility Bi-directional Meter. However, customer installs & owns meter socket.
7. Communication Device and/or Gateway

Figure 1400-2 One-Line Diagram - Customer Without Smart Inverter



Customer Furnishes, Installs, Maintains:

1. Interconnected DER connected in parallel with Ameren Missouri
2. DC Disconnect switch for generator:
   a) Some Inverters may integrate switch a lockable disconnect switch with inverter, which eliminates the need to install additional equipment if located outdoors.
   b) Ameren Missouri does not require a DC disconnect.
3. Inverter shall be labelled as IEEE 1547/ UL 1741 listed
4. Outdoor Lockable AC Disconnect located within 10 ft of revenue meter (exceptions may apply to distance).)
5. Main Service Disconnect

Ameren Missouri Furnishes, Maintains & Controls

6. Utility Bi-directional Meter. However, customer installs & owns meter socket.

1500.01 GENERAL REQUIREMENTS

1. Ameren is committed to both the safety of the public and its employees while maintaining reliable operation of its distribution system. Installations involving customer-owned and operated Distributed Energy Resources (DER) create the potential for serious personal injury as well as damage to the Customer's or Company's equipment.
2. In order to minimize potential dangers to utility employees and the public, all DER installations such as photovoltaic (PV), wind, energy storage systems (ESS), motor driven generators, or other systems shall adhere to UL 1741 and the most current Ameren Illinois approved version of IEEE 1547 as documented in the Ameren Illinois DER Customer Interconnection Policy, and when applicable shall comply with the Illinois Smart Inverter Rebate specifications, and any applicable requirements of the National Electrical Safety Code, the National Electrical Code, Institute of Electrical and Electronics Engineers (IEEE), Underwriters Laboratories (UL), Electrical Testing Laboratories (ETL), local electric codes, applicable NEMA codes, OSHA, the AHJ, and Company's Electric Service Rules as set forth in published tariffs. The Illinois Smart Inverter Rebate specifications can be found in the Illinois Distributed Generation Rebate Application. This document can be accessed from the Distributed Generation link on the Ameren Illinois Renewables Resource Center webpage.
3. **Anti-islanding protection is required for all alternate (non-utility) sources of energy.** Anti-islanding protection is a way for the DER system to sense when there is an abnormal condition on the utility grid, such as a power outage or other power quality issues. This standard prevents the DER from injecting power back to the utility grid**,** which would create a potentially hazardous condition for utility workers and the public**.** However, this requirement shall not be construed to prevent the DER/ESS system from continuing to feed the customer's critical loads using automatic transfer switches, manual transfer switches, or mechanical interlocks to prevent backfeed onto the utility grid.
4. For Behind-the-Meter (BTM) interconnections ≥ 200 kW, Ameren Illinois reserves the right to require a non-revenue production meter to monitor DER generation. For ESS systems with export capacity greater than 25 kW, Ameren Illinois reserves the right to require a revenue grade meter to monitor the output of the ESS to ensure that exporting ESSs are only charged by renewables (i.e. proper mode selection).
5. Careful selection of customer owned transformers and their protective equipment located on the load side of main disconnecting means must be made to prevent excessive overheating and to ensure detection of abnormal conditions such as Loss of Phase events. See **ASM Section 900.** The consequences of not detecting the Loss of Phase condition would be a violation of Standard IEEE 1547 as documented in the Ameren Illinois DER Customer Interconnection Policy.
6. Customer's DER system must include a lockable AC generation source disconnect that is operable and can be locked in the "OFF" position by Ameren Illinois personnel, Customer, and emergency personnel. This disconnect switch will allow the DER system isolation from Company's distribution facilities for maintenance, reliability, and safety concerns. Any **HOLD OFF** tags or clearances given to the Customer's lockable AC generation source disconnect must be honored by Ameren Illinois personnel, the Customer, and emergency personnel. Refer to **ASM Sections 1500.02.7** and **1500.02.8** for specific location requirements.

7. The lockable AC generation source disconnect shall be labeled by the customer with permanent placarding stating: **"LOCKABLE AC GENERATION SOURCE DISCONNECT."** If the lockable AC generation source disconnect is greater than 10 ft from the revenue meter or not within sight of the revenue meter, additional permanent placarding stating **"CAUTION: MULTIPLE SOURCES OF POWER – LOCKABLE AC GENERATION SOURCE DISCONNECT AVAILABLE FOR ISOLATION FROM UTILITY**" shall be installed on the AC Generation Source Disconnect and the main service disconnect. If the main service disconnect is not immediately visibly adjacent to the meter socket, an additional placard with this language will also be required to be permanently adhered to the meter socket, CT cabinet, or wall immediately adjacent. Placarding must also have additional verbiage to explain the exact location of the AC Generation Source Disconnect. Most times, there is a site overview map showing the facilities and identifying where the main service disconnect and the AC generation source disconnect is located. The site overview map is required to be attached to each of the above described locations.
    a. Permanent placards must be engraved on hard plastic and adhered to the meter socket lid and lockable AC generation source disconnect with permanent adhesive or adhered to the building exterior surface immediately adjacent.
    b. Use of a label maker or glued-on strips is not acceptable.
8. For an ESS integrated with DER installations, all premises must have a lockable ESS disconnecting means on the AC side of the DER system for an AC coupled ESS or on the DC side of the DER system for a DC coupled ESS, or its remote control, located at 1) a readily accessible location outside the building and 2) within 10 feet of the Lockable AC Generation Source Disconnect(s) and maintaining visibility. The ESS disconnecting means shall be permanently placarded "**ENERGY STORAGE SYSTEM DISCONNECT**" or "**ENERGY STORAGE SYSTEM DISCONNECT – REMOTE CONTROL"** (if remotely actuated). The ESS disconnecting means must also have a permanent placard outlining the operating characteristics listed in the 2020 NEC 706.15(C). The Energy Storage System Disconnect or Energy Storage System Disconnect – Remote Control must be depicted on the site overview map placard previously described, and the site overview map placard must also be adhered to the enclosure or the wall immediately adjacent.
9. For an ESS serving a critical loads panel, an integral or external automatic transfer switch (preferred), manual transfer switch, or mechanical interlock that allows transferring from the utility source to the DER/ESS system and vice versa must be installed. This transfer switch allows Ameren to disconnect utility power to the inverter by operating the lockable AC generation source disconnect for completion of the witness test without interrupting power to the critical loads panel. If the customer elects to install an ATS, the normal source should be utility grid power. If a manual transfer switch or mechanical interlock kit is used, then the critical loads panel must be served by utility grid power until the witness test is completed. After the completion of a successful witness test, the customer or installer should swap the manual transfer switch or mechanical interlock kit over so the normal feed is from the inverter AC output.

10. If a PV installation is served by more than one lockable AC generation source disconnect, then each disconnect must have a permanent placard depicting an aerial view of the location (including the boundaries of the respective PV panel systems) and the location of all lockable AC generation source disconnects. This placarding must identify how to de-energize a particular section of PV generation in order to ensure the safety of personnel working around the PV system and emergency responders. Additionally, each PV panel system shall have uniquely identifiable permanent placards matching the respective lockable AC generation source disconnect.
11. Customer DER systems must include appropriate wiring and metering equipment if the customer wants to sell or receive credit for excess electricity generated by the DER being injected back into the Ameren Illinois electric distribution system. The customer must file an application, including a detailed one-line diagram (when applicable), so that the process for interconnecting a proposed DER installation can begin.
12. Sales of electricity are regulated by various state and federal agencies, and it is the customer's responsibility to investigate all state and federal agency requirements before filing an application.

1500.02 SPECIFIC REQUIREMENTS

1. Customer DER systems shall be installed according to the manufacturer's instructions.
2. Customer is responsible for protecting their generator’s equipment in such a manner that faults or other disturbances on the Ameren Illinois electric distribution system or on Customer DER system do not cause damage to their equipment.
3. Customer shall furnish information to Ameren Illinois regarding their proposed generation equipment and protective devices prior to parallel operation. Company will check the adequacy of this proposed equipment and its compatibility with protective devices on the Company’s system and will either approve as submitted or specify additional equipment which will be required in order to begin parallel operation with the Company’s system.
4. Per the **Rewire Policy** in **ASM Section 200**, any work or wiring changes at the service will prompt the need to upgrade equipment to the latest service manual requirements, including but not limited to installing a lever bypass meter socket or CT enclosure.
5. Meter sockets and metering equipment enclosures are not to be used as junction boxes or raceways for customer owned distribution circuit wiring or alternate power source(s) circuitry and monitoring equipment. Only service entrance conductors are permitted in those metering enclosures. Once service entrance conductors leave the meter socket or metering equipment enclosure(s), they cannot re-enter the enclosure for any reason. Customer owned CTs and cabling used to monitor their loads and / or DER production output are not allowed inside the meter socket or metering equipment enclosures. Unauthorized wiring and equipment shall be removed by the customer at no expense to Company.

6. Customer's lockable AC generation source disconnect and lockable energy storage system disconnect shall comply with the following:
    a) One of the following types
        1) Manual operable switch or circuit breaker
        2) Load-break-rated pull-out-switch
    b) Simultaneously disconnect all ungrounded conductors of the circuit.
    c) Located outdoors where readily accessible.
    d) Enclosures with doors or hinged covers that are readily accessible to unqualified persons and have exposed live parts when the enclosure is opened must be secured in a manner that requires a tool to open the enclosure or must be lockable.
    e) Disconnect mechanism must be padlockable in the open (OFF) position.
    f) Plainly indicate whether in the open (OFF) or closed (ON) position.
    g) Have ratings sufficient for the maximum circuit current, available fault current, and voltage that is available at the terminals.
    h) Be marked with a warning when the line and load terminals are capable of being energized in the open position.
    i) The disconnect(s) must be within reach, with a maximum mounting height with the handle no higher than 6'7" above grade when in the "UP" or ON position.
    j) When the **lockable AC generation source disconnect(s)** or a **line-side tapped energy storage system AC disconnect** is a knife-blade safety switch (fused or non-fused), the conductors coming from the DER system must terminate on the bottom lugs of this disconnect. Utility supply will terminate on the top lugs of this disconnect.
    k) When the **lockable AC generation source disconnect(s)** or a **line-side tapped energy storage system AC disconnect** is a Circuit Breaker, the utility supply shall terminate at the ON side lugs of the breaker. The conductors coming from the DER system shall terminate at the OFF side lugs of the breaker.

7. **A LOAD SIDE TAP** is when the DER connects downstream of the customer's main service disconnect. The lockable AC generation source disconnect will be located outdoors, readily accessible, within 10 ft of the electric revenue meter, and between the inverter and a circuit breaker or fuse (overcurrent protection device - OCPD) located in the main distribution panel. This disconnect may or may not have overcurrent protection in this device. The maximum size of the proposed DER system is limited by the main service disconnect ampere rating, associated bus rating, and overcurrent protection device rating. Taking these values into account, the **maximum size** of the DER system can be calculated per NEC requirements.

   The lockable AC generation source disconnect must have an equipment grounding conductor that originates at the main service disconnect and terminates on the enclosure.

   The lockable AC generation source disconnect *may* have the following depending upon system configuration:

    a) System neutral
    b) Overcurrent protection

8. **A LINE (SUPPLY) SIDE TAP** is when DER interconnections are made between the customer's main service disconnect and Ameren's metering instruments or self-contained meter. A Line Side Tap requires a DER Main Disconnecting Means with overcurrent protection, similar as the Main Service Disconnecting Means. In some cases, the DER Main Disconnecting Means may also serve as the lockable AC generation source disconnect switch. When the lockable AC generation source disconnect is located downstream of the DER Main Disconnecting Means, the lockable AC generation source disconnect switch may or may not have over-current protection in this device. The lockable AC generation source disconnect must be outdoors, readily accessible, and mounted within 10 feet and in sight of the electric revenue meter. If this distance cannot be maintained – consult with your Ameren representative. The size of the proposed DER installation is limited by the ampere ratings of the service entrance conductors, metering equipment, and other service equipment ratings.

9. **LINE (SUPPLY) SIDE TAP POINT OF INTERCONNECTION (POI)** must comply with the following requirements:

    a) Conductors running from the POI to the DER Main Disconnecting Means and overcurrent protection device shall be no smaller than #6 AWG copper or #4 AWG aluminum.

    b) The conduit running from the POI to the DER Main Disconnecting Means shall contain only DER service entrance conductors. Monitoring cables and other customer circuitry are not permitted.

    c) If the customer chooses to install a production meter, it must be located after the DER Main Disconnecting Means (i.e. on the generator side).

    d) Where the DER circuit makes a POI outside of a building or at a meter structure (OH or UG), it shall be protected by an overcurrent device(s) at a readily accessible location outside the building, near a meter structure, or where the DER conductors enter the building. The overcurrent protection device shall be located within one of the following criteria:

        1) 15 ft of total conductor length from POI for dwelling units,

        2) 20 ft of total conductor length from the POI for meter structures,

        3) 20 ft horizontally or 30 ft of total conductor length (if bends are required) from the POI for buildings which are not considered to be dwelling units.

        *If current limiters are installed, the total conductor length can be extended by up to 41 ft for each category above, but in no instance shall unprotected conductors extend more than 10 ft into a building.

    e) Where the DER installation makes its POI to a service inside a building, they shall be protected by one of the following methods:

        1) with an overcurrent device located within 10 ft of conductor length in dwelling units and 16.5 ft in other than dwelling units from the point of connection to the service.

        2) in other than a dwelling unit, with an overcurrent device located within 71 ft of conductor length from the point of connection to the service, provided that cable limiters installed in all ungrounded conductors are located within 16.5 ft of conductor length from the point of connection to the service.

3) The DER overcurrent protection and associated supply conductors shall be sized to carry 125 percent of the rating of the sum of the DER sources.

f) For connections rated 1000 amperes or more to solidly grounded-wye services exceeding 150 volts to ground but not exceeding 1000 volts, phase-to-phase, ground-fault protection that meets the requirements of the NEC must be provided.

g) When interconnecting with existing 3-Ph 3-Wire ungrounded services, ground detection sensing equipment must be installed by the customer on existing service equipment and the new AC generation source service equipment. See **ASM Section 500**.

h) POI can be made in a junction box, trough, or tap box after the metering equipment but before the main service disconnect. DER POI must be made using listed connectors and comply with NEC enclosure fill requirements. All power distribution blocks installed on service conductors shall be marked as "Suitable For Use On Line Side of the Service Disconnect." Effective January 1, 2023, pressure connectors and devices for splices and taps installed on service conductors shall be marked as "Suitable For Use On Line Side of the Service Disconnect." 2020 NEC 230.46

i) Self-contained Meter Socket POIs:

1) 200 amp Ameren Revenue meter socket - The POI connection can be made in some Ameren revenue 200 amp meter sockets. The meter socket must be in good working order and lever bypass style. Presently, Milbank is the only mfg. that has a UL rated tap accessory kit that works only in their products. This kit allows the installer to replace the existing slide-in nut assembly of the factory lay-in lug with a new slide-in nut assembly that has a lug allowing for a 100 amp tap in addition to the normal lay-in lug designed to accommodate #6-350 kcm conductors.

2) 320 ampere/400 ampere max Ameren revenue meter socket – The POI connection can be made in this meter socket provided there are not more than 2 barrels per lug bolted onto the connector stud. Many of the factory lugs for this style of meter socket have non-rotating twin barrel lugs that accommodate #6 – 350 KCM conductors. These mfg. load side lugs must not be swapped out for different style such as stacked or stair-stepped lugs to accommodate extra conductors.

j) CT rated service installations – POI connections made inside stand alone or padmount CT enclosures are allowed on a case-by-case basis, depending upon the enclosure configuration and space allocation. Always consult with an Ameren Illinois representative and review the configuration inside the enclosure during the design process to verify a POI made inside the CT enclosure will not create a safety or clearance problem. Some additional items that Ameren Illinois takes into consideration when reviewing the enclosure are:

1) Lugs inside the enclosure must be UL approved for the application or UL approved for the specific enclosure.

2) Not allowed if CTs are hanging on the conductors or bar CTs without buss bars to bolt the CTs on. The CT enclosure must have buss bars for landing termination lugs on.

3) Not allowed to be made on conductor tails exiting elevated CTs, commonly referred to as bird cage CTs, located at the top of the meter pole or in close proximity to the weatherhead on buildings.

4) Must be aware that some CT enclosures have lugs that cannot be swapped out to achieve more barrels for terminations.

5) For existing installations, previous wiring methods may not allow for making a POI. An example of this would be an enclosure that does not have neutral lug(s) for cable terminations.

k) POI inside Ameren Illinois meter socket or CT enclosure will not be allowed in existing installations if this metering equipment is not deemed by Ameren Illinois to be in good condition and an acceptable POI method for the particular installation.

l) Insulated connectors such as those manufactured by NSI and ILSCO (IPCS, Nimbus, Polaris) used for making a multi-tap or insulated piercing connectors are not allowed to be used inside meter sockets or CT enclosures for making a POI.

m) When the POI is made within a line-side junction box or on the line-side conductors within a main service disconnect fed by multiple runs of service conductors using insulated connectors [such as those referenced in item l.)], the POI must intercept all runs.

n) Non-insulated connectors (ex. ILSCO PTT-2L-250-Z flag connectors) are not allowed to be used to add termination barrels inside meter sockets or CT enclosures for making a POI.

o) POI is not allowed to be made at the Ameren transformer lugs, even when customer revenue CT instruments are presently inside the padmount transformer.

p) When making a POI, if any portion of the supply conductors/cable has to be re-routed (such as installation of a junction box/terminal box) or lengthened, then the service installation must be upgraded to meet the current Ameren Electric Service Manual specifications, including relocating metering instruments and meter socket from the Ameren transformer to customer owned metering enclosures per Ameren policy found in **ASM Section 1001**.

q) An alternate location to consider for making a POI if it cannot be made inside the revenue meter socket or CT enclosure is a customer installed NEMA 3R tap box between the meter socket and the main service disconnect.

r) POI is allowed to be made inside Customer's Main Service Disconnect where space allows.

s) CT enclosures cannot be used as a junction box or raceway to route DER conductors and supporting DER hardware (i.e.: customer owned monitoring CTs or cabling)

t) In some cases, the existing supply conductors running from the padmount transformer/secondary pedestal/pole to the supply side of CT rated services may have a lower ampacity rating than the main service disconnect. Additionally, some existing customer owned, residential, single phase service entrance conductors for 100 ampere through 400 ampere installations were sized with reduced conductor ampacity as allowed by NEC 310.12. When making a line side tap, it should be verified that the supply conductors / service entrance conductors are properly sized for the proposed DER system. If the conductors are undersized, the customer must install new service entrance conductors at their expense from customer service equipment to the utility service delivery point.

u) When making a line side tap where the DER Main Disconnecting Means will be mounted on a separate structure from the service installation and these structures are not mechanically secured together to function as a single structure, then the supply conductors from the POI at the service installation to the DER Main Disconnecting Means must be run underground in a conduit system.

For a main service disconnect & DER Main Disconnecting Means mounted on separate structures, the DER Main Disconnecting Means must be mounted on a building or galvanized metal structure similar to as shown in **ASM Section 700** figures.

10. When making a Line (Supply) Side Tap from a service installation that is served from a grounded secondary utility system, the DER main disconnecting means must have the grounded (neutral) conductor run from the POI and properly terminated/grounded, even if Customer DER system does not require the grounded (neutral) conductor.

1500.03 DER INTERCONNECTION LIMITS

A. Single-phase Behind-the-Meter (BTM)

1. For single-phase DER connected line to center tap neutral of a 120/240 V service (i.e. 120 volts line-to-neutral), its addition (or aggregate addition) may not create an imbalance between the two sides of the 240 volt service of more than 20% of the nameplate rating of the service transformer. This same 20% limitation would apply to a 240/480 volt single-phase service (i.e. 240 volts line-to-neutral).
2. For single-phase DER connected line to neutral on a three-phase grounded wye system, the maximum aggregate DER size would be 20% of the nameplate of one of the single-phase transformers in the bank, or 20% of 1/3 of the nameplate of a unipot* transformer.
3. For DER connected line-to-line on two phases of a three-phase grounded wye system, the maximum aggregate DER size would be 40% of the nameplate of one of the single-phase transformers in the bank, or 40% of 1/3 of the nameplate of a unipot* transformer.
4. For single-phase DER connected line-to-line on a three-phase delta system, including open-wye/open-delta, the maximum aggregate DER connected line-to-line on the lighting transformer would be the difference of the ratings of the lighting transformer and one power transformer. If the single-phase DER is connected only line-to-neutral, the maximum aggregate size would be 20% of the line-to-line rating, or 20% of the single-phase rating of the lighting transformer.
5. Single-phase (line-to-neutral) aggregate DER connected to a three-phase system should not exceed 10kVA. Two-phase (line-to-line) aggregate DER connected to a three-phase system should not exceed 20kVA. Both of these limits apply to three-phase grounded-wye and delta center tap grounded configurations.
6. For floating delta and corner grounded delta secondary systems, only balanced three-phase connections will be allowed. This can be achieved by using a three-phase inverter or by banking line-to-line connected inverters.

*A unipot transformer is a transformer that contains all three phases within the same tank. This includes both overhead and padmount transformers.

**Aggregate DER refers to the sum of all such DER installations connected in the same manner to a common transformer.

B. Three-phase Behind-the-Meter (BTM)

1. For three-phase BTM DER interconnections that are served by an Ameren owned open-wye or open-delta transformer primary configurations to supply a three-phase service voltage, the maximum nameplate capacity of three-phase DER that can be connected is limited to 144% of the kVA rating of the smallest transformer.
2. For proposed BTM DER that exceed the limit in the paragraph above, if there are three primary voltage phases readily available, the service transformers should be replaced with a three-transformer bank or a single three-phase transformer to maintain phase balancing. Charges may apply to complete this upgrade. If the upgrade requires that the customer's total main size exceeds 600 A, the customer will be required to convert to one of the standard three-phase service voltages shown in **ASM Section 400**.

1500.04 DER INTERCONNECTION PROCESS REQUIREMENTS

Any customer requesting to connect DER – i.e. photovoltaic (PV), wind, energy storage systems (ESS), motor driven generators, etc. – for the purposes of net-metering (not emergency or stand-by generation) shall comply with the following requirements as a condition of service, in additional to the standard requirements for service, as stated in the Distributed Energy Resources Rule, 83IL Admin Code, Part 466. All service metering voltages will meet the standard voltages stated in **ASM Section 400**. Where non-standard service voltages exist, Ameren may allow DER interconnection at Ameren discretion.

The customer will comply with all Ameren Illinois Company general requirements for DER interconnections that are in the applicable Illinois Administrative Code, Ameren's Standards and Qualifications for Electric Service, and the Ameren Electric Service Manual.

Prior to being given **Permission To Operate (PTO)**, all installations must pass an Ameren Illinois administered witness test per the interconnection agreement.

On multiphase BTM systems interconnected with service installations that are fed by dedicated Ameren secondary facilities, Ameren ***may*** be able to complete loss of phase witness testing using Ameren equipment.

On multi-phase BTM systems interconnected with service installations serving critical loads or when Ameren secondary facilities serve multiple customers, the developer/installer shall provide a means to complete loss of phase (single-phase) testing on the load side of the main service disconnect. The developer/installer shall declare how they will facilitate the loss of phase testing on the one-line diagram submitted with all applications. The one-line diagram must point to permanently installed facilities to be used for loss of phase witness testing, or when temporary equipment is to be utilized, the rating of such equipment shall be listed and the equipment shall be shown in an inset off to the side of the permanent one-line indicating the location where the temporary equipment will connect. Ameren may provide feedback on the developer's/installer's loss of phase witness testing procedure and require modifications taking into account customer sensitivity and operation.

The proposed DER installation connected to Ameren Illinois shall meet the requirements mentioned in Table 1.

Table 1: Summary of Inverter Standards/Guidelines

References	Description
IEEE 1547-2003/2018	SMART Inverters connected to the Utilities systems shall be rated as compliant with the most current Ameren Illinois approved version of IEEE 1547 as documented in the Ameren Illinois Smart Inverter Specifications document.
UL 1741SA OR 1741SB	SMART inverters connected to the Utilities systems shall be rated as UL 1741SA or 1741SB safety compliant
IF applying for the Illinois SMART Inverter rebates, SMART inverters shall meet additional requirements stated in Rider CGR.	

Interconnection Resources

1) BuildWithAmerenIllinois.com or more directly at https://www.ameren.com/illinois/residential/supply-choice/renewables

2) **PowerClerk** https://amerenillinoisinterconnect.powerclerk.com/MvcAccount/Login
***This is the preferred application method.*

*** Please email inquiries to RenewablesIllinois@ameren.com.**
**** If the applicant needs to submit hard copy application forms and associated documents, these can be submitted to RenewablesIllinois@ameren.com.**

Table 2: Distributed Energy Resource (DER) Interconnection Applications (Application Levels as of 5/25/2022)

Level	Description
1	Lab-certified, inverter-based interconnection equipment with an aggregate electric nameplate capacity less than or equal to 50 kW and a maximum export capacity of 25 kW.
2	Lab-certified interconnection equipment with an aggregate electric nameplate capacity greater than 25 kW and less than or equal to 5 MW. Lab certified is defined in 466.30.
3	DER facility does not export power utilizing an export control listed in 466.75. For connections to area or sport networks, nameplate capacity rating of all aggregate generation on the network is less than or equal to the lesser of 50 kVA or 5% of the network's maximum loading. For radial distribution circuits, the aggregate export capacity of all generation (existing and proposed) on the circuit must be no greater than 10 MVA or less than or equal to 10 MVA if connecting to a radial distribution feeder.
4	Nameplate capacity rating is less than or equal to 10 MVA and the distributed generation facility does not qualify for a Level 1, Level 2, or Level 3 review, or the distributed generation facility has been reviewed but not approved under a Level 1, Level 2, or Level 3 review. Any generation larger than 10 MVA would be covered by 83 Ill. Adm. Part 467.

For a complete list of criteria and most current tariff filings, please refer to 83 Ill. Adm. Part 466, Electric Interconnection of Distributed Energy Resources Facilities, which can be found at the following link: https://www.ilga.gov/commission/jcar/admincode/083/08300466sections.html.

Level 2 and Level 4 BTM DER interconnections for which the Ameren Illinois planning analysis requires system upgrades: Metering interval data, provided by Ameren Illinois, will be required for at least one year, or if the customer is new, detailed operating load information will be required to be provided by the customer for proper transformer and other Ameren Illinois equipment evaluation (sizing and charges). If larger equipment is required to serve the DER than is required to serve the load, the customer will be required to pay the difference without the benefit of delivery service revenue credit. A functional one-line must be submitted by the customer to enable Ameren Illinois to perform the analysis.

DER interconnections to the Ameren Illinois secondary spot and grid networks found in Bloomington, Decatur, and Peoria are subject to Level 3 review. Due to operational complexities of network protectors found on the secondary spot and grid network systems, Level 3 interconnections **SHALL NOT** export (backfeed) power on the Ameren Illinois distribution system. It is the customer's responsibility to install appropriate equipment to ensure the DER installation will adhere to the **NO EXPORT** criteria of the Interconnection Agreement with Ameren Illinois. As part of the Level 3 process, Ameren Illinois must conduct a thorough engineering review of the DER interconnection application that requires interval demand information from the customer for the previous 12 months. If Ameren Illinois does not have the interval demand history, the customer will be responsible for all costs to install an advanced revenue metering package to obtain this data.

Access to Premises

Ameren Illinois may enter Customer's premises without prior notice:

1. to, at all reasonable hours, inspect Customer's DER and protection devices and read or test any meter for the Facility.
2. to disconnect, at any time, without notice, the Facility, if in Ameren Illinois' sole opinion, a hazardous condition exists and that immediate action is necessary to protect persons, or Ameren Illinois' facilities, or property of others from damage or interference caused by
    a) Customer's Facility or
    b) Customer's failure to comply with the requirements of this Agreement
3. to take monthly readings of the bidirectional digital meter for billing purposes. Self-reads and reads from adjacent properties are not permitted.

1500.05 METERING

1. Parallel generating facilities connected to Company's system are divided into two groups:
    a) **Non-exporting DER** would apply to Customer's facilities whose load is significantly larger than their generating capacity so that no Customer generated power would flow into Company's system except under fault conditions. This metering scenario also applies to DER systems that are not allowed to export due to interconnection with Company's secondary spot and grid networks.

For non-exporting DER, the AC generation source disconnect or associated circuit breaker will be tripped by equipment capable of detecting the reverse power flow condition toward Company's system. This type of installation requires a single revenue meter installation with detent to prevent operation of the meter in the reverse direction.

b) **Export Capable DER** would apply to Customer's facilities whose load is sufficiently variable or smaller than its generating capacity so that excess Customer generated power could flow into Company's system.

For export capable DER, the revenue metering shall include a bi-directional meter (commonly referred to as the net metering). The meter will be capable of measuring kWH in both directions, one register indicating kWH to the customer from Ameren Illinois and a second register indicating kWH to Ameren Illinois from the customer.

2. Metering equipment shall be Ameren approved. Refer to the Ameren Approved Metering Equipment List, which can be found at BuildWithAmeren.com.

1500.06 AMEREN WITNESS TESTING

1. The Customer understands that Ameren ***may*** conduct a witness test of the distributed energy resource (DER) facility, from the point of interconnection to the Lockable AC Generation Source Disconnect and from the point of interconnection to the Energy Storage System (ESS) Disconnect, to ensure that all equipment has been appropriately installed and that all electrical connections have been made in accordance with the applicable codes.
2. The Customer further understands that Ameren ***may***, but is not required to, identify wiring and electrical equipment practices that may raise safety and/or reliability concerns for Ameren and/or the Customer on the Customer's side of the point of interconnection. Ameren reserves the right to identify safety and/or reliability concerns prior to or during witness testing that could lead to the witness test being suspended or a delay in the issuance of permission to operate (PTO) until corrections are made.
3. To the extent that Ameren does identify wiring and electrical equipment practices that may raise safety and/or reliability concerns for Ameren and/or the Customer on the Customer's side of the point of delivery, the Customer understands that said identifications are not being made by certified inspection authorities and should be verified by a certified inspector and/or local governmental authorities.

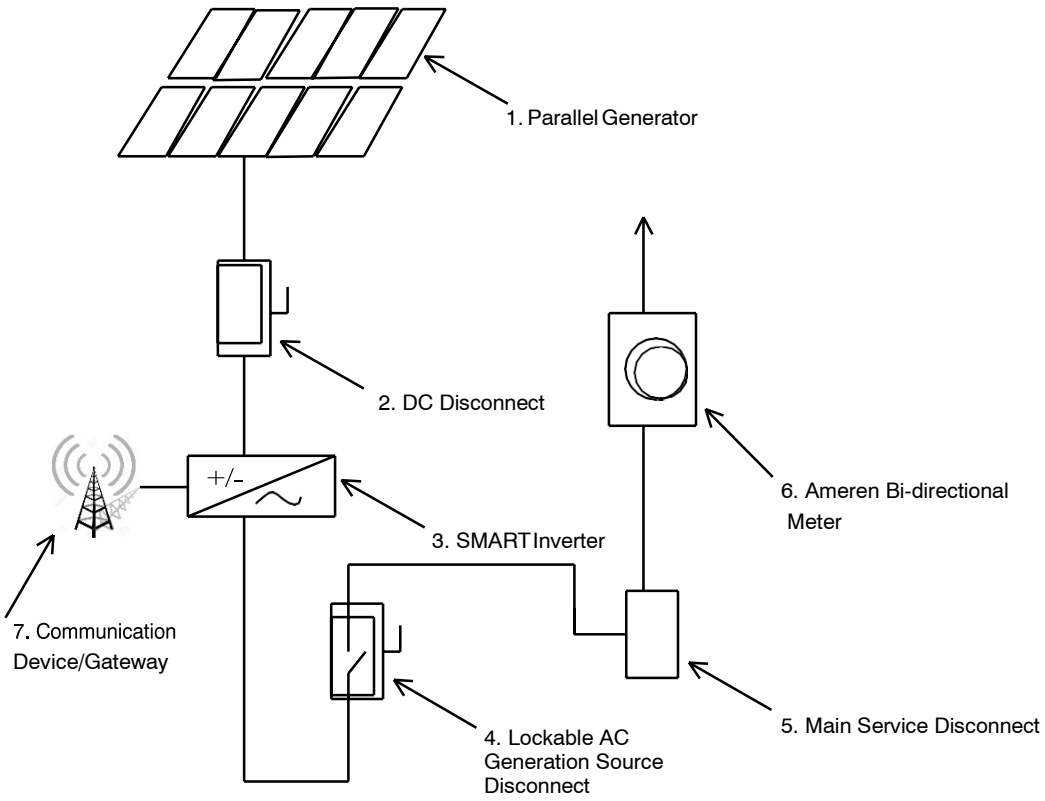
1500.07 TYPES OF INVERTER INSTALLATIONS

A **Smart Inverter** is a device that converts direct current into alternating current and can autonomously contribute to grid support during deviations from normal operating voltage and frequency conditions by providing each of the following: dynamic reactive and real power support, voltage and frequency ride-through, ramp rate controls, communication systems with ability to accept external commands, and other functions from the electric utility.

Smart Inverters are distinguished from inverters without smart capabilities in three ways:

1. They can modify their real power (Watts) and reactive power (VARs) output to provide grid support.
2. They can respond autonomously to voltage/frequency changes.
3. They can respond to communication signals.

Figure 1500-1 One-line diagram - Smart Inverter Connection



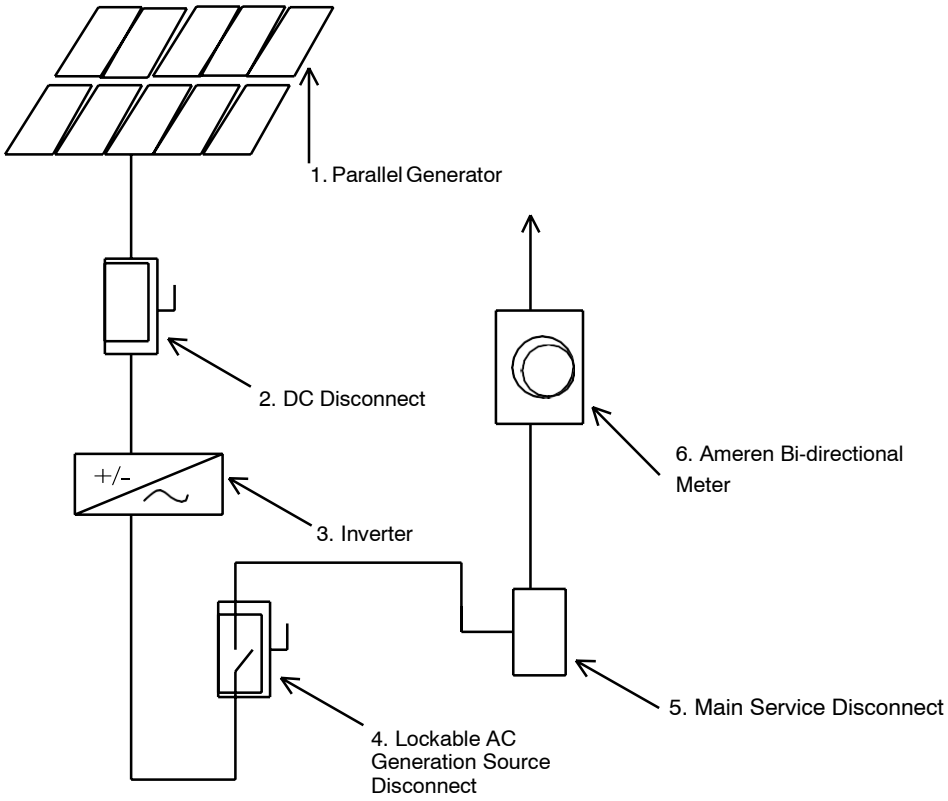
Customer Furnishes, Installs, Maintains:

1. Interconnected DER connected in parallel with Ameren
2. DC Disconnect switch for generator:
    a) Some inverters may integrate a lockable disconnect switch with the inverter, which *may* eliminate the need to install additional equipment if located outdoors.
    b) When a DER system includes an ESS, Ameren Illinois also requires a lockable outdoor ESS disconnect (or a lockable remote control for indoor located ESS disconnects).
3. Inverter shall meet the certification requirements listed in the Smart Inverter Specification attached to Rider CGR to be considered a Smart Inverter by Ameren Illinois.
4. Outdoor Lockable AC Disconnect located within 10 ft of revenue meter (exceptions may apply to distance).
5. Main Service Disconnect

Ameren Illinois Furnishes, Maintains, & Controls:

6. Utility Bi-directional Meter. However, customer installs & owns meter socket.
7. Communication Device and/or Gateway

Figure 1500-2 One Line Diagram - Customer without Smart Inverter



Customer Furnishes, Installs, Maintains:

1. Interconnected DER connected in parallel with Ameren Illinois
2. DC Disconnect switch for generator:
    a) Some inverters may integrate a lockable disconnect switch with the inverter, which *may* eliminate the need to install additional equipment if located outdoors.
3. When a DER system includes an ESS, Ameren Illinois also requires a lockable outdoor ESS disconnect (or a lockable remote control for indoor located ESS disconnects).
4. Inverter Shall be labeled as IEEE 1547 / UL 1741 listed
5. Outdoor Lockable AC Generation Source Disconnect located within 10 ft of revenue meter (exceptions may apply to distance).
6. Main Service Disconnect

Ameren Illinois Furnishes, Maintains & Controls

7. Utility Bi-directional Meter. However, customer installs & owns meter socket.