METERING INSTALLATION

GENERAL REQUIREMENTS

1. METER SOCKETS

Meter sockets are supplied and installed by the customer or an electrical contractor. The meter socket shall be mounted so the socket jaws are in true horizontal and vertical planes and will support the meter without tilt in any direction.

Meter sockets shall comply with applicable Company Service Requirements, per SR-400 Series and will be bonded per code.

Self-contained socket ratings:

Residential - All sockets shall have a maximum ampere rating not less than the ampacity of the main service switch. Maximum ampere rating of socket being 125 percent of continuous duty rating.

Commercial - All sockets shall have a continuous duty ampere rating not less than the ampacity of the main service switch.

2. METER SWITCH

For each and every meter, the customer or his contractor shall furnish and install a switch or other "approved disconnecting means" which shall control all of and only the energy registered by that meter. Service will not be rendered until switch is installed. The meter switch or other approved disconnecting device must have provisions for sealing it in the OFF position with a padlock seal. This may be accomplished by sealing the handle or breaker in the OFF position or by placing the handle or breaker in the OFF position and sealing the cover of the meter switch. Pull Out fused disconnects are not allowed. In the latter case, each meter switch must be individually covered. The meter switch shall be bonded per code. Meter switch panel designs that circumvent the locking mechanism of the door or switch, by means of removing the panel cover are not approved for installation. This requirement applies to all switchboards, stand-alone, and switchgear installations.

3. METER SWITCH LOCATION WITH RESPECT TO METER

Every meter switch installed on a service of less than 600V shall be on the load side of the meter or metering equipment.

For residential service installations, the switch must be located outside in the immediate vicinity of the meter socket and accessible from the same working area as the meter socket.

For commercial installations, the switch may be located in an Equipment Room, as described on Page 7 or a Meter Room, as described on Page 8. However, if the switch is installed outside, it must be located in the immediate vicinity of the meter socket, the same as for residential services.

14 For 480V 3-phase switchboards or switchgear containing a self contained meter or multiple self-contained meters, a circuit breaker(s) shall be installed on the source side of the meter equipment. The circuit breaker(s) shall be sized to limit available arc flash incident energy at the metering equipment to less than 8 calories/cm². The switchboard or switchgear shall have appropriate arc flash labeling, including all information required by OSHA. The circuit breaker(s) shall be installed in a cubicle with a panel designed to be sealed with a Company lock, but allowing the breaker operating handle to remain exposed for manual trip and reset operations.

4. MAXIMUM AND MINIMUM SOCKET HEIGHTS

Maximum height to center of socket is six feet, three inches. Minimum height to center of socket is three feet, six inches. When a meter room is provided, the minimum height shall be three feet, except for multi-meter packs for which the minimum height is permitted to be two feet, six inches.

5. METER SOCKET AND METER SWITCH IDENTIFICATION

Residential, apartments and commercial service entrances shall have the complete street address of premises where new service is required plainly displayed. The address is to be placed on the front of the building and at each apartment or suite in plain view. For individual residential homes permanent addressing is required at the service entrance (See below for permanent identification requirements).

For apartment buildings and commercial buildings, TEP will not install service until all switches, meter sockets and interior distribution panels (first sub-panel) are permanently identified and the wiring from the multi-meter pack to the interior distribution panel is installed and terminated. Interior distribution panels (first sub-panel) will be labeled on the panel door and on the back or side of the interior of the panel (See below for permanent identification requirements).

Permanent identification for switches, meter sockets and interior distribution panels shall be made with metal tags with raised letters and/or numbers no smaller than 1/2 inch. Identification labeling must maintain identity after being painted and shall be attached with rivets or screws. Apartment and commercial unit door labeling will be no smaller than 3/4 inch.

When all of the meters in a multi-meter pack are scheduled to be set, Company's Meter Department will require the assistance of the customer, customer's agent or Service Provider prior to the setting of meters to verify that each meter socket is for the unit served through the socket.

6. METER ROOM

Meters and metering equipment may be grouped in an accessible meter room. Service Provider must have unrestricted access to meter room(s) to facilitate reading and testing of meters. (See Meter Room defined on Page 8)

7. SEALING OF TERMINATING PULL BOXES, RACEWAYS, ETC.

All terminating pull boxes, raceways, etc., installed on the line side of meter sockets shall have provisions for sealing with a padlock and/or wire seal.

12 Access plates are required to cover hubs, knockouts or non-factory created holes entering the Companies section of metering equipment. The opening must be secured with an access plate that is rainproof and can be secured with an internal wingnut bar that spans beyond the opening. A carriage bolt must be installed from the external side of the plate and be long enough to be properly secured on the inside of the box, meter socket or raceway.

GENERAL REQUIREMENTS

8. SEALS

10 Service Provider will seal all meter rings and devices mentioned in Requirement 7. The seal is a bond of mutual protection for the Service Provider and the customer. It may not be broken by anyone except Company personnel and persons provided permission by the Service Provider. If it becomes necessary for an electrician to access an enclosure which has been sealed by the Service Provider, customer must call to schedule a Power Kill a minimum of 5 working days prior to the time the access is required, refer to SR-106 for additional detail. Seals installed by the Company will have the Company name identified on the seal.

9. METER AND/OR INSTRUMENT TRANSFORMER CABINET LOCATIONS

10 Meter equipment shall be installed on an exterior wall and will be accessible for reading and testing without entering the building. With approval from Design Services meter(s) and metering equipment may be grouped in an accessible meter room. See Meter Room, Requirement 6 and Meter Room Definition, SR-405, Page 8, for additional information.

10. PROHIBITED METER AND/OR INSTRUMENT TRANSFORMER CABINET LOCATIONS

In the interest of providing service to our customers and safe working conditions for our employees, certain locations for equipment installations shall be prohibited. Meters and associated equipment shall not be installed in the following locations unless prior approval is given by Design Services.

A. In any rest, bath, shower, or toilet room.

B. Directly over any door, window, stairway, ramp, or steps.

C. In any hazardous location.

D. On any roof, attic, or place not in general use.

E. In any basement.

F. In any equipment room.

G. Approval of locations D, E, and F will be based on the following facts:

1) The meter and metering equipment are readily accessible for reading and testing, and access to them does not require procuring a key from the customer or permission to enter on each occasion. If, for any reason the customer (original or future) decides to stop Service Provider access to a metering location, the meter and metering equipment must be moved to a new approved location at the customer's expense.

2) The location shall not be used to store valuable merchandise, equipment, etc.

3) The location does not require Company employees to take hazardous or time consuming methods to gain access.

4) The location is not a high security area with restricted access.

GENERAL REQUIREMENTS

10. PROHIBITED METER AND/OR INSTRUMENT TRANSFORMER CABINET LOCATIONS (CONTINUED)

H. Any location where moisture, fumes, vibrations, or dust may interfere with the operation or materially damage the meter or metering equipment or may present a hazard to Company employees.

I. In any substation or transformer vault, unless the meter is in an enclosure which is effectively screened from the high voltage compartment and contains no bare or exposed energized parts. Entry to vaults must be through normal doorways, not manholes, etc.

J. In any enclosed show window or one having a raised platform or behind a sales counter.

K. In or on any transformer cabinet, unless specifically designed and approved for that purpose.

13 L. Under any carport, breezeway, patio, porch or area that can be enclosed with building expansion. Existing overhead type service entrances may remain under a carport, breezeway, patio or porch unless the area is to be enclosed. Underground type service entrances must be relocated if the service is upgraded. All residential service types must be relocated if the service entrance is enclosed within any room, garage, screened in area, etc..

M. In any school building hallway subject to student traffic.

N. Any location subject to vehicular traffic which will present a hazard to the meter, meter readers, or service men, such as driveways, loading docks, etc.

O. Any location where at least three feet of working clearance is not provided in front of all meter equipment.

P. Any location that will require reading or servicing from within the fenced portion of a freeway.

Q. In any area where a door swings and could result in damage to equipment or prevent safe operation.

R. In any elevator shaft or hatchway.

S. On any surface subject to excessive vibration.

T. In any projection room.

U. Directly over any stove or plumbing fixture.

V. On any balcony or mezzanine floor, unless such balcony or mezzanine floor has a clear stairway of normal tread or rise and with utility approval.

W. On the front exterior wall of a residence, unless mutually agreed to by the home builder, or customer and Service Provider. Other locations may be deemed prohibited, by Design Services, because of hazardous conditions or inaccessibility.

13 X. Any floor above ground floor or sub-grade, without prior approval from Service Provider, except as allowed per SR-419.

Y. On or enclosed in any bedroom wall or bedroom closet wall.

Z. On or recessed in the external surface of any building that is built within 3 feet of any property line or inline with any walk, alley, or driveway giving access to commercial or Industrial property. Other locations may be deemed prohibited, by Design Services, because of hazardous conditions or inaccessibility.

METERING INSTALLATION

GENERAL REQUIREMENTS

11. WORKING SPACE

A level standing and working surface shall be provided and maintained in front of each metering installation. The service trench will be backfilled to final grade before calling for a metering inspection. The meter height is to be 3'-6" minimum and cannot exceed 6'-3". A clear and unobstructed working space shall be provided above the surface. The width of the working space shall be sufficient to permit ready access to the metering equipment and in no case less than 3 feet. The height of the working space shall be no less than 7 feet. The working space shall extend at least 3 feet in front of the surface on which the metering equipment is mounted and no less than 10 inches from the meter centerline to any obstruction such as walls, plants or trees, see SR-405, Page 10, for additional information.

12. PROTECTION OF METERS AND METERING EQUIPMENT

In the interest of public safety and to prevent destruction of the customer's meter socket and Service Provider's meter, the customer when instructed by the Company shall provide and install a protective cabinet for enclosure of the socket and meter. This requirement shall be mandatory for installations located in parks or school yards. (See SR-420, Page 1, Meter Enclosure Cabinets.)

13. SEPARATION OF WIRING

Unmetered customer service wires and metered load wires are not to be run in the same conduit, raceway, or wiring gutter. Metered and un-metered wires shall be separated by suitable barriers. Metered wires from the customer's distribution section (branch circuits) shall not pass through sealable sections.

14. GROUNDING

The meter socket or enclosure shall be effectively grounded in compliance with applicable requirements of local governmental inspection codes, or National Electrical Code requirements in the absence of local codes.

15. SERVICE REPLACEMENT, UPGRADE OR RELOCATION

Where the meter or service line location on the Customer's premises is changed at the request of the Customer or due to alterations on the Customer's premises, the Customer, at his expense, must provide and have installed all wiring and equipment necessary for relocating the service entrance and service line connection. The Company will assess a charge for moving the meter and/or service line. Where the customer alters his premises, the relocation of the service line and/or meter is at the Customer's expense.

15 All efforts shall be made to insure the existing underground service conductors terminate on the manufactured connector in the new service panel. In the event the existing service conductors are insufficient in length, the Company may install a splice in the customer's pull section or within Company equipment to restore power to the customer. Splices will not be installed in inaccessible areas or within conduit sytems. At the Company's discretion, the customer may be required to lower the service entrance to obtain sufficient length or provide a new conduit system and service riser from the service entrance to the Company equipment. Meter sockets that are lowered must still maintain the mimimum height requirement of 3'-6" from final grade to center of the socket or they will not be approved. If the exisiting service conductor is damaged and meets the Service Provider's required design criteria, the replacement of the conductor will be billable.

Current transformers (CTs) used for transformer-rated metered services are no longer allowed in the secondary compartment of the Service Provider's three-phase pad-mount transformers. Upgrades or replacements of this service type require removal of CTs from the transformer and installation in an approved customer installed CT cabinet or switchgear section. Refer to SR-422 and SR-430 for additional information.

16. COLOR CODING FOR THREE-PHASE SERVICE CONDUCTORS

Wiring shall be color coded as follows:

PHASE	208/120V	240/120V	480/277V
A	BLACK	BLACK	BROWN
B	RED	ORANGE	ORANGE
C	BLUE	BLUE	YELLOW
NEUTRAL	WHITE	WHITE	GRAY
GROUND	GREEN	GREEN	GREEN

The service conductors shall be marked (taped) at the source and at the termination can or CT can. Start the marking tape 6 inches from the end of the conduit and for minimum of 4 inches. Each Neutral will have a complete addressed 1/2 inch DYMO aluminum label installed above this area facing out, so it can be read when accessing the cabinet compartment.

NOTE:
As a reminder when marking the power leg inside of a 240/120V or 480/240V safety socket box, place the conductor in the far right hand side of the safety socket box. Refer to SR-410, Page 3 Note 11, Page 7 Note 8 and Page 10 Note 11.

17. ATTACHMENTS TO OR COVERING OF COMPANY METERS

Unless granted prior permission from the Service Provider, Customer shall not cover or attach anything to any Company meter.

18. DAMAGE TO UNDERGROUND CONDUCTOR 

If the existing service conductor is damaged and meets the Service Provider's required design criteria, the replacement of the conductor will be billable. Customer may also be responsible for installing and updating service and conduit system to align with current standards and design criteria. The Company will not allow splices on damaged underground service conductor.

METERING INSTALLATION

DEFINITIONS

ABOVE GROUND PEDESTAL (J-BOX): Houses secondary to service cable connections typically in residential subdivisions.

AGENCY CLEARANCE: The approval of an electrical installation by the governmental agency having jurisidication as an indication of compliance with its standards.

AMPS INTERRUPTING CURRENT (AIC OR SHORT CIRCUIT DUTY): The device rating to safely interrupt the flow of fault current.

ALL-IN-ONE SERVICE ENTRANCE SECTION (SES): Equipment manufactured as one unit.

AMERICAN WIRE GAUGE (AWG): The AWG assigns a number to a particular size of wire according to circular mill area to a maximum size of #0000.

AGENCY CLEARANCE: The approval of an electrical installation by the governmental agency having jurisidication as an indication of compliance with its standards.

CONTINUOUS DUTY RATING: Operation at a substantially constant load for an indefinitely long time.

CONTINUOUS LOAD: A load where the maximum current is expected to continue for three hours or more.

CURRENT OR VOLTAGE TRANSFORMERS (CT AND VT) INSTRUMENT TRANSFORMERS: Transformers used to change electric current or voltage to values suitable for use in metering the consumption of electric energy. These are owned, furnished and installed by the Company.

CT CABINET OR CAN (INSTRUMENT TRANSFORMER ENCLOSURE): In general, a metal cabinet owned and furnished by the customer, installed by the customer's electrical contractor, for use by the Company to enclose the Company's instrument transformers. Only CT cans approved by the Company and meeting Company specifications may be installed.

EMT: Electrical Metallic Tubing

EQUIPMENT ROOMS (COMMERCIAL AND INDUSTRIAL): An equipment room is an illuminated room provided by the customer for the customer's service entrance equipment. The room doesn't have a doorway opening to the outside of the building or into a public hallway; therefore, the Service Provider's meter or meters must be located on an outside wall in the immediate proximity of the equipment room. Service Provider must have access to the equipment room during normal working hours.

ELECTRIC UTILITY SERVICE EQUIPMENT REQUIREMENTS COMMITTEE (EUSER or EUSERC): The EUSER Committee is an organization comprised of utility representatives from the Western Section of the United States which works to promote the standardization of electric service requirements and the design and engineering of metering and service equipment.

FAULT CURRENT: The short circuit amperage current produced during the unintentional contact of two parts of an electrical circuit that offers an alternate path for current to flow.

GENERAL PUBLIC AREA: An area where the general public has free access.

GROUNDED: Connected to earth or to some conducting body that serves in place of earth.

GROUNDED CONDUCTOR: A system or circuit conductor that is intentionally grounded.

GROUNDING CONDUCTOR: A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

GROUNDING ELECTRODE: A ground electrode (rod) driven into earth to provide a base reference for voltage and a path to ground for fault current.

IMPAIRED CLEARANCE: The condition where a customer's structure(s), including, but not limited to, buildings, signs, towers, poles, fencing and swimming pools, is in a position or manner in which insufficient clearance, as specified by any applicable local code(s) and the National Electric Safety Code, as such codes now exist or as such codes may be amended, exists between the structure and the Company's existing transmission, substation, express feeder, street light or distribution line facilities, or any combination thereof.

DEFINITIONS

INSTRUMENT TRANSFORMER COMPARTMENT OR CABINET: The Company requires a compartment in the service entrance equipment, or a separate cabinet furnished by the customer for the installation of the Service Provider's current transformers and, in some cases, voltage transformers. The compartment or cabinet is for Service Provider use only and shall be locked and/or sealed Company seals and locking devices. Contact Service Provider for their requirements. The compartment or cabinet shall not be used as a raceway for customer load conductors, other service conductors or any other equipment. The compartment or cabinet is to be used solely for Company equipment.

INSTRUMENT TRANSFORMER METERING: Instrument transformers are used when either the current or voltage of a service is too great for a meter supplied by the Service Provider to be installed as a self-contained meter. Current and voltage transformers have "secondary" windings in which the current or voltage is reduced by known ratios from that of the incoming service. These smaller voltages and/or currents are applied to an "instrument-rated" meter, the readings of which must be multiplied by a constant to obtain actual usage of the service. Instrument transformers are normally used on voltages above the nominal 480V level, on 480V services with 201 amps or more and on 208Y/120V or 120/240V services with 201 amps or more.

LOAD: The ratings of the power consuming apparatus which may be connected to the Service Provider's installation or system under consideration.

MANUAL BYPASS: A mechanical jumper installed by a technician to keep the customer in service while a meter is removed for inspection or exchange.

METER ROOM (COMMERCIAL AND INDUSTRIAL): A meter room is an accessible, illuminated room provided by the customer for the location of the customer's electric service and metering equipment and for the installation of the Service Provider's meter(s). The meter room may not be used for communication equipment. The meter room shall not be used for storage, and the working space is to be kept clear and unobstructed. Meter rooms shall be provided with a doorway opening to the outside of the building or into a public hallway. Meter rooms are not required to be locked. If a meter room must be locked, a push-button wall mount key lock box will be provided to customer for installation to provide unrestricted access to the Service Provider. Upon notification Design Services will provide the required number of key lock box(es) to the customer to be securely attached on the exterior wall, within 12 inches of each meter room door. A key for the door shall be provided to the Service Provider for placement in the key lock box, prior to energizing of meter equipment. It is the responsibility of the customer to ensure that if a door lock is changed a new key is provided to the Company. The customer is to ensure that any locking mechanism on a meter room door(s) is in compliance with any Federal or State Fire Code Requirements.

METER ENCLOSURE: A Company approved metal cabinet owned and furnished by the customer and installed by the customer to enclose the Company's metering equipment. Meter enclosures will be sealed by the Company with an approved seal or lock.

POWER LEG (WILD LEG): The "C" (third) phase of a 4-wire delta secondary service shall be marked "orange". Orange colored vinyl electrical tape is an acceptable means for marking the conductor.

SECURELY ATTACHED: Attached to withstand anticipated loads and not subject to loosening.

SELF-CONTAINED METERING: A self-contained meter is one which, when installed on a socket or mounting device, is capable of carrying the total current of the service supplied to the customer and of being directly connected to the line voltage of the service.

SERVICE ENERGIZATION: The connection of a service to a voltage source.

TYPE OF SERVICE: The characteristics of electric service described in terms of voltage, phase, frequency and number of wires.

WILD LEG: See "POWER LEG".

WITHSTAND CURRENT RATING: The maximum fault current rating that the device is rated to withstand.

USE: REQUIREMENTS FOR
RESIDENTIAL SOCKET
MAXIMUM 200 AMP SERVICE

METERING INSTALLATION

10

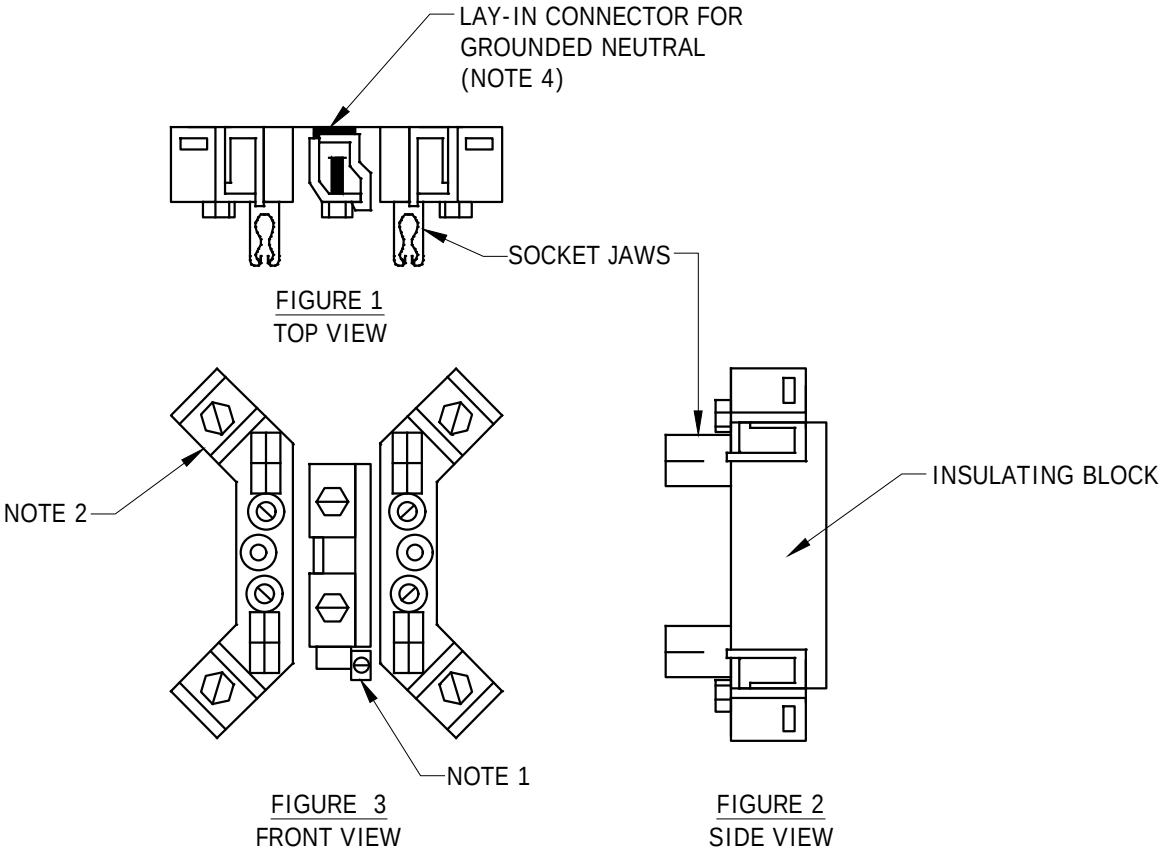


FIGURE 1
TOP VIEW

FIGURE 3
FRONT VIEW

FIGURE 2
SIDE VIEW

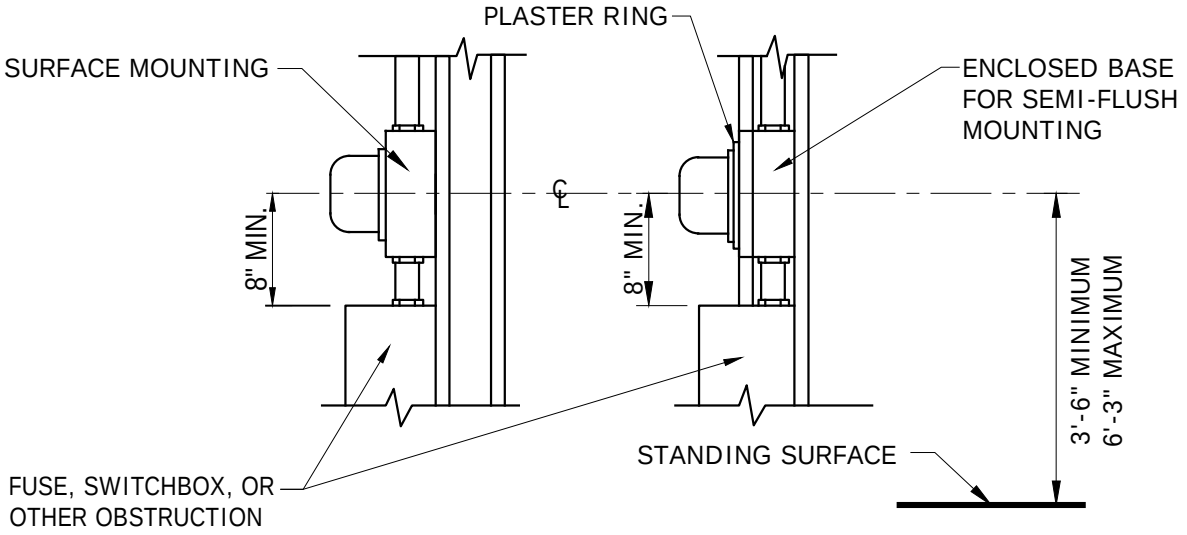
NOTES:

1. NEUTRAL TAP REQUIRED FOR 5 JAW SOCKETS ONLY, 120/208V, SINGLE-PHASE.
2. FOR UNDERGROUND SERVICE, LINE SIDE CONNECTORS MUST BE LAY-IN TYPE APPROVED FOR COPPER OR ALUMINUM CONDUCTOR AND SHALL BE CAPABLE OF ACCEPTING #6-1/0 AWG (100A) OR 1/0AWG-250kcmil (200A). FOR OVERHEAD SERVICE, THEY MUST ACCOMMODATE CUSTOMER'S LINE AND LOAD CONDUCTORS WITHOUT REMOVAL OF STRANDS FROM ENDS OF CONDUCTORS.
3. SOCKETS MUST CONFORM TO ANSI C12.7 AND BE LISTED BY A QUALIFIED ELECTRICAL TESTING LABORATORY PER NEC.
4. FOR UNDERGROUND SERVICE, THE LAY-IN CONNECTOR FOR GROUNDED NEUTRAL MUST BE SUITABLE TO TERMINATE LINE AND LOAD NEUTRAL CONDUCTORS IN THE SOCKET AND SHALL BE BONDED TO ENCLOSURE. LINE SIDE NEUTRAL CONNECTOR MUST BE APPROVED FOR COPPER AND ALUMINUM CONDUCTOR AND ACCEPT 1/0-3/0 AWG CONDUCTOR.
5. RESIDENTIAL SOCKETS SHALL HAVE A MAXIMUM AMPERE RATING NOT LESS THAN THE RATING OF THE MAIN SWITCH OR SERVICE EQUIPMENT. MAXIMUM AMPERE RATING OF SOCKET IS 125 PERCENT OF THE CONTINUOUS DUTY RATING.
6. ONLY RING-TYPE SOCKETS WILL BE APPROVED.
7. SOCKET COVER SHALL NOT BE REMOVABLE WITHOUT REMOVING METER. LATCHING DEVICE OR MOUNTING SCREWS SHALL BE ACCESSIBLE ONLY AFTER METER IS REMOVED. SEE SR-418 FOR METER PACK REQUIREMENTS.

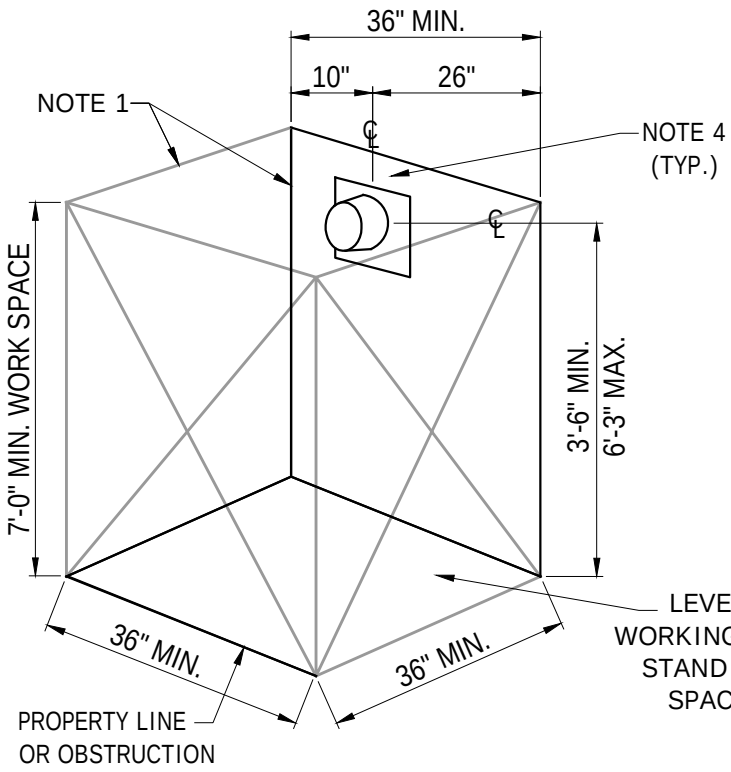
USE: SPECIFICATIONS FOR METER ENCLOSURES AND CLEAR WORKING SPACE

METERING INSTALLATION

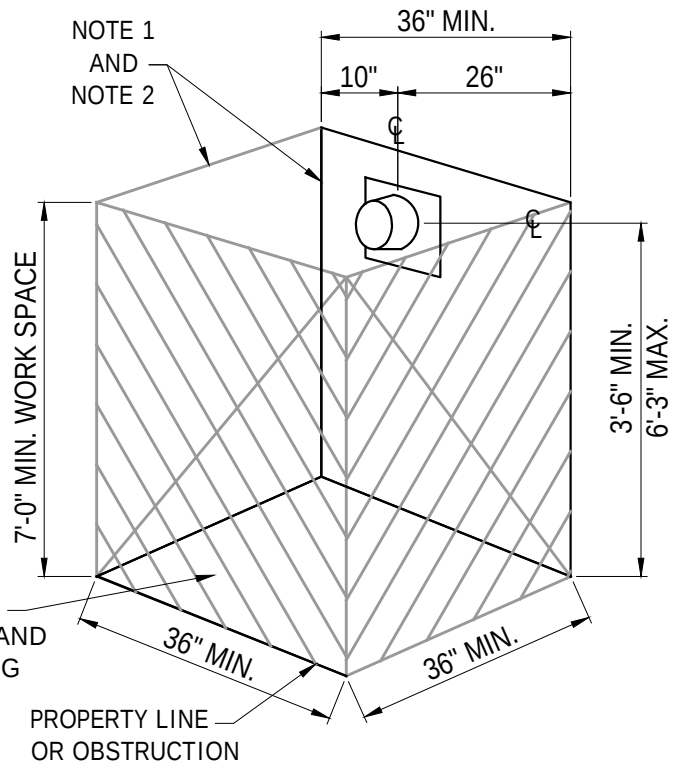
EUSERC DWG. NO. G6 & G7



NON-ENCLOSED METER



SEMI-FLUSH METER



SCREEN WALL METER

LEVEL WORKING AND STANDING SPACE

NOTES:

1. NEAREST SIDE WALL OR OTHER OBSTRUCTION.
2. ONE SIDE OF SCREEN WALL TO REMAIN OPEN.
3. SR-405, PAGE 5, NOTE 11.
4. NINE (9) INCH MINIMUM TO ANY OBSTRUCTION ABOVE METER.