Electric Service Requirements

Commercial and Industrial Engineering Specification T004

March 2025

SMUD®

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Category:

ELECTRIC SERVICE REQUIREMENT

SUBJECT:

COMMERCIAL AND INDUSTRIAL

Table of Contents

1. PURPOSE

This Engineering Specification is used to set forth the Sacramento Municipal Utility District (SMUD) requirements pertaining to the material and installation of commercial and industrial service equipment for new electric service and for changes to existing facilities. The requirements are necessary for SMUD to supply uniform and safe service throughout SMUD's service territory. It is important that the customer and their representatives, including contractors, read and understand this specification in its entirety because service will not be connected until all the requirements are satisfied and approved by all the appropriate inspection authorities including SMUD.

USE CAUTION WHEN DIGGING.
TO AVOID BURIED ELECTRICAL CABLES,
CALL U.S.A. (Underground Service Alert)
BEFORE DIGGING
800-227-2600 or 811

2. SCOPE

This specification applies to the material, construction, and installation requirements for electric commercial and industrial distribution throughout SMUD's service area.

3. GENERAL REQUIREMENTS FOR SERVICE

3.1 This is a guide to the Sacramento Municipal Utility District's (SMUD) requirements for the establishment of electric service to new or re-wired commercial/industrial installations. The requirements presented here are necessary for SMUD to supply uniform, satisfactory, and safe service. It is necessary that all written material (this text, as well as all the notes on the drawings) be carefully read.

3.2 It is important that early arrangements be made in advance of the installation of electric service lines and the location and setting of meters. Go to www.smud.org/projectapplication or contact SMUD's Customer Services Department, 6301 S Street, 1-888-742-7683, for new or additional service. This must be accomplished as soon as initial planning is considered. Delays in supplying this required information could cause an unnecessary inconvenience for the customer. Electric service shall **not** be established until the "service entrance facilities" and interior wiring are satisfactorily completed by the customer.

NOTE: "Customer service entrance facilities" is the term used to designate all the electrical components required to be furnished and installed by the customer.

3.3 Building plans and definite load information for commercial and industrial installations must be furnished to SMUD Engineering Designer EA105 at P.O. Box 15830, Sacramento, 95852-0830, as soon as possible. Delays in supplying this required information could cause an unnecessary inconvenience for the customer.

3.4 Where the operation of the customer's equipment will require unusually stable voltage regulation, beyond that supplied by SMUD in the normal operation of its system, the customer shall be responsible to protect their own equipment. Any special or auxiliary equipment required by the customer shall be installed on the load side of the meter. The customer, at their own expense shall install, own, operate and maintain this special or auxiliary equipment.

3.5 In addition to SMUD's own requirements, the customer is responsible for complying with applicable provisions of City and County ordinances, the California Electric Code (CEC), the National Electric Code (NEC) and all applicable orders, rules and regulations of the State of California. All meter panel and customer service switchboard equipment shall meet SMUD and EUSERC requirements and be UL approved. For information on EUSERC, see www.euserc.com.

3.6 No service can be connected until approved by the appropriate Authority Having Jurisdiction. Only authorized SMUD employees are permitted to make connections between SMUD wiring and customer wiring.

3.7 SMUD will normally require a new commitment after one year unless a customer has requested and received written approval for a longer period of time from a SMUD Engineering Designer.

3.8 Commercial and Industrial contracts and/or agreements with SMUD shall be executed in accordance with the provisions of SMUD Rules and Regulation 16.

3.9 The customer's service voltage shall be determined by SMUD's Engineering Designer. Multiple service voltages to one building or parcel of property shall only be granted upon approval of SMUD's Engineering Designer and local inspection authorities.

3.10 Normally, only one service point shall be granted to one building or one parcel of property. Multiple service points may be granted to one building or multiple buildings on one parcel, provided they meet the requirements of the CEC and NEC, as well as the requirements of SMUD and local inspection authorities.

3.11 All commercial meter installations with a service main disconnect or combined breaker ratings greater than 200 amps must be reviewed and approved by SMUD. Submit a PDF file to: MetershopSubmittals@smud.org prior to fabrication. Include the address and service notification number in the subject line.

3.12 Meter locations for all installations shall be designated by the SMUD Engineering Designer. The meter(s) shall be located within three (3) feet of the corner of the building closest to the SMUD service point and shall be a minimum of three (3) feet from all property lines. Meter locations other than described above shall not be allowed without advance written permission from the Engineering Designer. Any deviations shall be made only for special structural requirements and must be approved by the Engineering Designer. Meter locations other than those described above are subject to additional charges, payable prior to meter installation.

3.13 This guide may not cover all situations or installations. If an installation is not addressed or identified within this guide the customer shall seek approval from a SMUD Engineering Designer prior to construction.

4. ABBREVIATIONS

The following abbreviations may be used throughout these Service Requirements:

A.	=	A Type Meter	Int.	=	Interval
Amp or A	=	Amperes	KW.	=	Kilowatts
Ag. Can	=	Agricultural Meter Can	L.P.	=	Lightning Protector
			Man.	=	Manual
C.C.	=	Circuit Closing	M.B.	=	Meter Mounting Base
CEC	=	California Electric Code	M.D.	=	Maximum Demand
Cl.	=	Class of Meter	NEC	=	National Electric Code
Comb. Can	=	Combination Can	O.H.	=	Overhead
D.B.	=	Direct Burial	R.M.T.	=	Rigid Metallic Conduit
E.B.	=	Encased Burial	S.	=	S Type Meter
El.	=	Element	S.P.	=	Separate Potential
EUSERC	=	Electric Utility Service Equipment Requirements Committee	S.S.	=	Safety Socket
			U.G.	=	Underground
			UL	=	Underwriters Lab
G.O.	=	General Order	V.	=	Volts
I.M.T.	=	Intermediate Metallic Conduit	W.	=	Watts

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5. MINIMUM REQUIREMENTS FOR COMMERCIAL/INDUSTRIAL ELECTRIC SERVICE INSTALLATIONS

5.1 Underground Services, Commercial/Industrial

5.1.1 City or County inspects all UG services and determines panel size, conductor size, and number of conductors required.

5.1.2 Customer to provide all conduit and conductor to a location designated by SMUD.

5.2 Overhead Service Drops, Commercial/Industrial

5.2.1 A "service drop" is the span of overhead conductors from SMUD's pole to the customer's building or structure and does not include the "drip loops". The drip loop is formed by connecting the ends of the customer's service entrance conductors to the service drop.

5.2.2 Unless special permission is granted by SMUD's Engineering Designer, the length of the service drop is not to exceed 100 feet (distance measured from the nearest SMUD pole to the point of attachment). In addition, the point of attachment shall be located on that part of the building nearest to and facing SMUD's pole.

5.2.3 The height of the point of support or attachment on the customer's building must be sufficient to provide the necessary ground clearances prescribed by all applicable orders, rules and regulations of the State of California, General Order 95 of the California Public Utilities Commission, the CEC and NEC, and City and County ordinances.

5.2.4 In the area accessible to pedestrians only, where the 12-foot minimum clearance applies, clearances shall be measured from either the lowest point of the drip loops or the lowest point of sag of the service drop conductors, whichever is lower. Where proper height cannot be maintained by going to the highest point on the face of the building, a periscope type service riser shall be used (See Page A-5).

5.2.5 In addition to the required ground clearances, the service drop must have a "radial clearance" of three (3) feet from any building exit, window, door or other opening at which human contact might be expected. In the case of a service drop located above the horizontal plane through the top extremity of such an opening, the three (3) foot minimum clearance may be reduced to the maximum practical radial clearance. In no event, however, shall it be less than one (1) foot (See Page A-4).

5.2.6 Due of the necessity of meeting these clearances and a variety of other problems, it is imperative that you contact SMUD before you decide on a point of attachment for the service drop. A SMUD Engineering Designer will help you select a point of attachment that shall meet SMUD's requirements. Call 1-888-742-7683 to request a meter spot. SMUD shall not connect to an unsuitable location selected by the customer or his representative.

5.2.7 Eye bolts or securely bolted service racks are required for support of the service drop and must be installed by the customer through a minimum of 2-inch x 4-inch backing. Lag screws are not permissible.

5.2.8 The point of attachment should be located at or near the corner of the building nearest and facing the pole designated by SMUD as the pole from which the service drop will be installed. In all cases, the SMUD Engineering Designer must approve the service attachment location.

5.2.9 The Engineering Designer must be consulted on all rewire jobs which involve proper service wire clearance over a swimming pool or metallic roof.

5.3 Service Head

5.3.1 An approved, rain tight service head shall be installed at a point suitable for connecting the service entrance conductors to the service drop.

5.3.2 The service head shall be located as close to the center point of the service attachment as practical. Unless it is impractical, the service head should be higher than the point of attachment (See Page A-5 for illustrations of minimum clearances above the roofline).

5.4 Service Riser Conductors

5.4.1 The Authority Having Jurisdiction must be consulted for size and type of wire.

5.4.2 The service riser conductors must be continuous and without splices. Neutral line wire (white) shall be continuous and without a splice from the service head through the bonding lug to the neutral bar in the switch. Where special permission is granted, the neutral line may be broken if the socket is equipped with an approved connection device.

5.4.3 A minimum of 24 inches of conductor must remain outside of the service head and allow for a proper drip loop at the service connection.

5.5 Service Conduit

5.5.1 The Authority Having Jurisdiction must be consulted for size and type of conduit.

5.5.2 Conduit should be in one continuous length from the service head to the meter socket. A limited number of threaded couplings shall be permitted when building construction makes a continuous run impractical. If gutters are used, they shall be equipped with sealing devices.

5.5.3 All Line side Rigid Metallic Conduit (RMC), or Intermediate electrical conduit (IMC), must have threaded connections including the terminating connections, i.e. Myers Hub.

5.5.4 For overhead service RMC, or IMC, of 1 ½ inch inside diameter is the minimum service riser conduit acceptable for attaching SMUD service cables. The customer must provide the point(s) of attachment.

5.5.5 For underground services, schedule 80 PVC is required for service riser feeds above ground and owned by SMUD. Any non-SMUD owned conduit type would be decided between the customer and local jurisdiction. If there is a request for a different type of conduit it would need to be reviewed and approved prior to installation.

5.5.6 Fire protection, in accordance with the Authority Having Jurisdiction, is required where service risers are enclosed in combustible materials.

5.5.7 Conduit may be concealed in building walls and/or attics on the Utility (line) side of the meter under the following conditions:

5.5.7.1 A semi-flush, mounted, combination meter socket main breaker is used.

5.5.7.2 A 1 1/2 inch minimum inside diameter conduit is used.

5.5.7.3 Conduit is in one continuous vertical run from the meter service entrance to a minimum of 6 inches above where the conduit leaves the concealed wall and/or attic. No condulets or sleeves are allowed in the concealed area.

5.6 Meter Location

5.6.1 A clear, unobstructed workspace shall be left on all sides of the meter (See Page A-1).

5.6.2 In addition, the requirements for dedicated equipment space shall comply with the CEC and NEC.

5.6.3 It is preferred that all metering equipment be located on the outside of the building. Only with prior SMUD approval, metering equipment may be placed inside a building per section 5.7. Metering equipment shall include; metering sections, current transformer sections, potential transformer sections, pull sections, and the building's main disconnect. Any questions regarding the location of the metering equipment, please contact Field Metering @ (916) 732-5167.

5.6.4 Electric meter installations shall be accessible to authorized representatives of SMUD for reading, testing, and inspection at all times.

5.6.5 Drive-thru lanes, carports, breezeways, covered or screened porches or any other area that might be enclosed at some future date shall not be selected as a meter location.

5.6.6 Meters or metering equipment shall **not** be installed in elevator shafts, ventilator shafts, clothes closets, broom closets, lavatories, in or over stairways, over doorways, windows, sinks, wash trays, gas meters or other grounded objects, in driveways, or in any other hazardous location.

5.6.7 The area on either side of a door or swinging window, equal to the width of that door or swinging window, is **not** acceptable as a meter location.

5.6.8 A level standing space on the property of the customer shall be provided in front of each meter to permit ready access to the meter. This space must be at least 30 x 36 inches and contain no working obstructions (See Page A-1).

5.6.9 When the meter is enclosed, the 30 x 36-inch level standing space shall be measured from the outside face of the meter enclosure (See Page A-26). Egress from unobstructed level working space shall be free from any objects that could potentially impede the safe exit of SMUD employees.

5.6.10 For enclosed meters the maximum meter-socket height measured from the center of the socket to the standing working surface is six foot three inches (75"). The minimum height is three feet (36").

5.6.11 For egress, clearance between adjacent objects (live-bus equipment, grounded parts, walls, etc…) and the front of the meter enclosure shall be measured from the enclosure doors, in the open 90-degree position. The minimum clearance shall be 36".

5.7 Meter Room

5.7.1 SMUD shall have external building access to the meter room.

5.7.2 Meter room access shall be keyed to SMUD “S1” key or other SMUD approved method.

5.7.3 Sufficient working light shall be provided in the meter room, with operating switches at each doorway.

5.7.4 Meter Room doors shall have a working door stop.

5.7.5 A minimum of 1-2 receptacle outlets shall be placed near the electrical service equipment.

5.7.6 All applicable clearances around meter enclosures, meter sockets, switchboards, electrical equipment, etc…shall be per CEC and NEC.

5.7.7 Required installation height of meter sockets and other electrical equipment shall be from standing grade, not equipment grade.

5.7.8 Required entrance to, and egress from, working space shall be per the CEC and NEC.

5.7.9 All egress from meter rooms shall discharge to the exterior of the building.

5.7.10 In certain cases, the customer may be required per CEC and NEC to provide two (2) entrances into a meter room for appropriate egress. This is a code issue between the customer and local authorities having jurisdiction.

5.7.11 Meter Rooms shall not be used for storage.

5.7.12 If meter communication cannot occur due to meter room location, the customer must supply means for communication to occur with the metering equipment (relay, additional conduit and antenna, etc…).

5.7.13 Where equipment in the room is rated 800A and above an egress door must be provided within 25ft of the edge of the working space. Doors shall open in the direction of egress and be equipped with listed panic hardware.

5.7.14 For multiple meter room installations, each meter room shall have a main service disconnect. Multiple meter rooms installations must be approved by SMUD.

5.8 Meter Socket

5.8.1 The meter socket must be installed in a true vertical plane.

5.8.2 Any unused outlets in a meter socket must be sealed with internally removable plugs.

5.8.3 Die-cast meter sockets shall **not** be used as a wiring gutter for more than two meters.

5.8.4 Commercial, self-contained meter sockets shall be U/L approved and shall have a continuous duty current rating equal to or greater than the current rating of the associated load service equipment.

5.8.5 Neutral taps shall be connected to the service neutral conductor and shall be located behind sealed panels. Wire nuts are **not** permitted.

5.8.6 Meter sockets with extruded or cast aluminum jaws are **not** acceptable and shall not be connected.

5.8.7 Standard switchboard service sections can be used on all services having a main size of 201 amperes or more.

5.8.8 SMUD's Meter Division is to be contacted for prior approval on jobs involving anything labeled "special".

5.8.9 The customer's wiring for new service or rewiring shall include a grounded conductor or bus in the service entrance equipment. The grounded conductor or bus shall connect to the proper terminals in the service entrance meter compartment and service switch. Sizing of this conductor or bus shall be in accordance with the requirements of the Authority Having Jurisdiction.

5.8.10 All Meter Sockets shall be ring type.

5.9 Test Bypass Devices for Self-Contained Meter Installations

Approved test bypass devices are required on **all** SMUD designated commercial installations:

5.9.1 Exceptions: Test bypass devices are not required for single phase services to signboards, temporary power poles, and accessory buildings located on residential properties that qualify for a separate service and conform to residential zoning restrictions.

5.9.2 See pages A-21 through A-23.

5.10 Service Main Disconnect

5.10.1 The service main disconnect, or main breaker, must be installed on the load side of the SMUD meter.

5.10.2 If the service main disconnect is installed outside, it shall be of an approved rain-tight type.

5.10.3 If the meter socket and service main disconnect (main breaker) are in separate enclosures, the wiring between the two enclosures must be in R.M.T., I.M.T. electrical conduit or approved sealable raceway.

5.10.4 The ampacity ratings for service main disconnects or main breakers are approved by the Authority Having Jurisdiction.

5.10.5 For services with breakers, having an adjustable amperage setting, the amperage shall be permanently labeled on the panel with oil-based paint pen or an engraved placard installed with rivets.

5.11 Grounding

5.11.1 An approved, concrete encased electrode (ufer ground) must be used for all new construction.

5.11.2 The Authority Having Jurisdiction must be consulted for the required ground conductor type and size and for other types of grounding.

5.12 Metering Arrangement

5.12.1 The metering arrangement approved as standard and required by SMUD provides for the line current to enter first the meter and then the disconnect (switch) and overload protective devices (fuses or circuit breakers).

5.12.2 Unmetered service wires and metered load wires shall not be combined in the same conduit, raceway, or gutter.

5.13 Metering Emergency Alarm Systems

5.13.1 SMUD policy does not allow connections to a customer's service preceding the electric meter. In those cases when it is impractical to install an emergency alarm system on the load side of the service meter, a separate house meter for the emergency system shall be required.

6. METER INSTALLATIONS ON LOW VOLTAGE SWITCHBOARDS, 0-600 VOLTS, 0-4000 AMPERES

6.1 Switchboards – General

6.1.1 Use of a reactive, volt-ampere-hour meter to measure power factors may be necessary, depending upon the rate under which service is rendered and the amount of load. Some rate schedules call for measurement of the power factor if a certain demand is exceeded for three (3) months consecutively. SMUD shall provide specific information on these subjects upon request.

6.1.2 All compartments containing unmetered conductors shall be sealable. When a raceway or conduit for "the wiring between the meter and the current transformers" is necessary, it shall be sealable and used exclusively for revenue metering.

6.2 Switchboard Service Section

6.2.1 A service section is defined as the section of a customer's switchboard provided specifically for housing the metering current transformers (if required), the revenue meters and test facilities, and the service main disconnect or main breaker. SMUD shall accept them only if the following requirements are met:

6.2.1.1 Metered and unmetered wiring shall be separated (not cabled together) so that it is readily apparent that the entire load is being metered.

6.2.1.2 Factory, "harness style" wiring (or equivalent) shall be used between the "hot gutter" and the line terminal of each meter

socket and also between the load terminals of each meter socket and the line side of the corresponding circuit breaker.

6.2.1.3 Connecting wires between the meter socket load terminals and the circuit breaker line terminals shall be separately color coded for each position in the row.

6.2.1.4 The relation of the individual meter socket, breaker and address served shall be permanently and clearly marked with the meter panels in place.

6.2.1.5 When the installation is completed, all panels must be removable for inspection of wiring.

6.2.1.6 Panel design shall permit convenient replacement of any individual meter socket or jaw assembly.

6.2.2 When two or more switchboard service sections (standard or specially engineered) are supplied from one set of service conductors, the supply bus and any connections to it shall be located above the current transformer position in a separate sealable enclosure outside of the current transformer compartment. The supply bus it to be arranged so that it is readily accessible and may be worked upon without disturbing the current transformers and the associated secondary wiring.

6.3 Standard Switchboard Service Section

6.3.1 The general arrangement of a standard switchboard service section is shown on Page A-10.

6.3.2 The standard section now utilizes a hinged meter panel located in front of the current transformer compartment to minimize the overall space requirements. It should be noted that hinged meter panels must be sealable and easily removed with the hinges readily interchangeable from the right or left side on the job site. They must also have handles and open a minimum of 90° on the side that it is hinged with meters and test switches mounted to permit safe and ready access to the instrument transformer (See pages A-11 and A-12).

6.4 Specially Engineered Service Section

6.4.1 Switchboard designs which do not conform to the standard switchboard arrangements are considered specially engineered. Specially engineered service sections include installations:

6.4.1.1 Any service greater than 600V.

6.4.1.2 Over 1000 amperes.

6.4.1.3 Where more than one bus (multi-leaf) is used per phase.

6.4.2 Various arrangements for specially engineered service sections are suggested in the illustrations on pages A-13 through A-18.

6.4.3 When a specially engineered service section is necessary, three drawings of the proposed section shall be submitted to SMUD metering for approval prior to manufacture. The drawings shall indicate the contractor's and the customer's name and address and the installation address.

6.4.4 The general arrangement of a specially engineered switchboard service section should follow as nearly as practical that of the standard section. In designing a specially engineered service section, the following general requirements shall be observed:

6.4.4.1 Socket meters, used with current transformers, shall be mounted on hinged panels. Self-contained meters shall be mounted on non-hinged panels.

6.4.4.2 When a hinged meter panel is located behind a door, a clear space of at least 11 inches is required between the meter panel and the door, as well as a 90° opening with meters and test switches in place. The access door shall be provided with a single latching device. The access door(s) shall be equipped with devices to accommodate two padlocks.

6.4.4.3 A clear space in back of the meter panel, at least 4 inches deep, shall be provided for secondary wiring and for the back of the phase shifting device required for determination of power factor. If recording or graphic demand metering is required, SMUD must be consulted to determine any additional space requirements.

6.4.4.4 Sockets installed on switchboards shall be of a design acceptable to SMUD.

6.4.4.5 Provision should be made for mounting a reactive, volt-ampere-hour meter, unless SMUD specifically indicates that it is not required. The opening for the phase shifting device shall be covered with a flat plate fastened on the inside and painted to match the switchboard.

6.4.4.6 A minimum of 4 inches of clear space is required directly below the bottom slot of the meter test switch to permit safe connection of test leads.

6.4.4.7 Not more than two meters shall be mounted on any removable meter panel.

6.4.4.8 Panels, which provide access to instrument transformers, shall not be larger than required for good accessibility. Removable panels shall be equipped with lifting handles mounted slightly above the panel center and shall not be heavier than can be conveniently lifted by one person.

6.4.4.9 The front edges of the current transformer bus bars shall all be located in the same vertical plane.

6.4.4.10 A removable bus section and suitable transformer support shall be provided to permit the installation of window type transformers for all installations over 1000 amperes.

6.4.4.11 Busses shall be adequately supported in the current transformer compartment to withstand the mechanical stresses of short circuit. The bus supports shall not interfere with installation or removal of current transformers. Current transformers shall not be used to support the busses. The busses must be entirely self-supporting.

6.4.4.12 The busses and current transformer mountings shall be designed so that each of the current transformers may be withdrawn from its mounting position directly through the access panel without disturbing any other current transformer.

6.4.4.13 When multi-leaf busses and/or current transformers are used, the busses shall be oriented so that they appear "edgewise" when viewed from the access panel.

6.4.4.14 The general arrangement and spacing of current transformers and the methods of mounting current transformers shall conform, in so far as practical, to the illustrations on pages A-13 through A-15.

6.5 Service Entrance Location

6.5.1 In the Standard and Specially Engineered Switchboard Service Sections, the direction of feed shall be vertical, and no other conductors shall pass through this compartment.

6.5.2 In addition, for underground services 801-4000 Amps or for multiple metering switchboards, bus bars shall be extended into the terminating pull section. For underground services 0-800 Amps, lug landings in the terminating pull section or pull box, connecting conductors between such landings and the current transformer compartment, shall be provided by the customer.

6.6 Sequence

The service switch shall be on the load side of the metering equipment in all cases (Meter-switch-fuse sequence).

6.7 Current Transformer Compartments

6.7.1 If either the capacity of the service switch exceeds 200 amperes or the capacity of the conductors supplying a breaker or group of breakers exceeds 200 amperes, transformer compartments shall be required.

6.7.2 Details of the size and arrangement of current transformer compartments for the Standard Switchboard Service Sections are shown on pages A-13 thru A-18.

6.7.3 The current transformers supplied by the serving agency for revenue metering shall not be utilized for any other purpose. Covers for current transformer compartments shall be made of code gauge metal. If non-hinged panels are used as covers, they shall be provided with lifting handles and be attached with sealable studs and wing nuts or by other approved means.

6.7.4 The customer shall furnish lugs and connect the cable to the line and load sides of the bus stubs in the current transformer compartment. The ends of the bus bars shall be located so that the current transformers can be connected without removing adjacent panels. The bus supports in the current transformer compartment shall be sufficiently rigid to maintain alignment of the bus after the service conductors are connected to the bus stubs and before the current transformer(s) is installed.

6.7.5 When links and supports for through type current transformers are required, the bus and removable links must be of a compatible material and hardware.

6.8 Meter Panels

6.8.1 The hinged meter panels shown on pages A-11 and A-12 are designed to accommodate only transformer rated socket meters.

6.8.2 The non-hinged meter panels shown on page A-19 are designed to accommodate only self-contained socket meters.

6.9 Meter Sockets

6.9.1 The following table shows the type of meter sockets to be furnished:

Self-Contained Meters

Service		Meter Clips/Terminals
*Single Phase	Two or three wire	4
*Single Phase	Three wire wye, 120/208V	5
Three Phase	Four wire delta	7
Three phase	Four wire wye	7

Meters with Current Transformers

Service		Meter Clips/Terminals
*Single phase	Three wire	6
Three phase	Four wire delta	13
Three phase	Four wire wye	13

*See Drawing A-13, Note 10

6.9.2 When socket-type meters are used, sockets shall be furnished with approved sealing rings installed by the switchboard manufacturer.

6.10 Meter Height

6.10.1 When meters are located in a meter room or when fully enclosed in a cabinet the minimum height of the meter shall be 36 inches, and the maximum height shall not exceed 75 inches. These heights are measured from the standing surface, not equipment surface, to the center line of the meter. Cabinets shall not impair working space.

6.10.2 When meters are wall or surface mounted, but not located in a meter room or enclosure, the minimum height of the meter shall be 48 inches, and the maximum height shall not exceed 75 inches. These heights are measured from the standing surface to the center line of the meter.

6.11 Meter Marking

Where more than one revenue meter is installed in a building, each meter position shall be clearly and permanently marked by the building owner to indicate the particular location supplied by it (See also Section 7.3 Non-Installation of Meters, smud.org/construction – Addressing Guidelines for Multi-Unit Buildings, and EUSERC Section G.15.)

6.11.1 Service shall not be established until this identification has been completed.

6.12 Meters and Test Facilities

Transformer rated meters and test equipment shall be furnished and installed by SMUD.

6.13 Self-Contained Meters

6.13.1 Self-contained meters are those having current coils designed to carry the line current. They do not require current transformers.

6.13.2 Sockets for self-contained meters and test facilities shall be wired by the switchboard manufacturer.

6.13.3 Spacing for various combinations of self-contained meters are shown on page A-19.

7. REQUIREMENTS FOR COMMERCIAL MULTIPLE METER INSTALLATIONS

7.1 Meter Cabinets and Enclosures

7.1.1 The cabinet shall be designed so that no obstruction such as door jambs, vertical posts, etc., be allowed within the cabinet opening. With the cabinet door open, a clear working space of 36 inches is required directly in front of the cabinet for installing the meter.

7.1.2 Shallow cabinets, with holes cut in the doors for meters to protrude through, shall not be permitted.

7.1.3 Clearances between the sealing flange of the meter socket and the inside of the closed cabinet door shall be a minimum of 11 inches, but not more than 15 inches for commercial and industrial meter installations (See Page A-2).

7.1.4 Hinged doors shall not exceed 4 x 4 feet and shall be provided with a device to hold them in the open position safely.

7.1.5 All doors shall be fitted properly to ensure positive opening and closing and shall be equipped with adequate pulls, hinges and latches.

7.1.6 Cabinets shall be rain tight and constructed of weather resistant materials. All top openings (conduits entering and leaving) shall be flashed and sealed.

7.1.7 When cabinets are to be locked with the customer's lock, a double lock arrangement shall be provided to accommodate a SMUD padlock.

7.1.8 If the socket is installed for future use, plastic meter covers shall be used to cover energized sockets. Where extra meter sockets have been installed in multi-meter installations and have no probable future use, the internal bus must be removed from the socket and the socket opening closed.

7.1.9 For multiple-meter installations in a multi-meter enclosure, the meter sockets shall have a minimum horizontal clearance of 7-1/2 inches, center to center, and a minimum vertical clearance of 8-1/2 inches, center to center.

7.2 Totalized Metering

Totalized metering **may** be available for certain larger commercial/industrial services. Check with SMUD's Engineering Designer for information.

7.3 Non-Installation of Meters

7.3.1 The meter(s) shall not be installed until:

7.3.1.1 The customer has complied with all the requirements listed above.

7.3.1.2 The work has been passed by the proper Authority Having Jurisdiction.

7.3.1.3 Each service switch and meter position, in a multiple meter installation, has been clearly and prominently marked in a permanent manner with an oil base paint or an engraved plate has been fastened with screws to indicate the particular address supplied by it. Street address and suite, apartment number, etc., are permanently applied to the building.

8. SWIMMING POOL CLEARANCES FOR SUPPLY SERVICE DROPS (INCLUDES HOT TUBS)

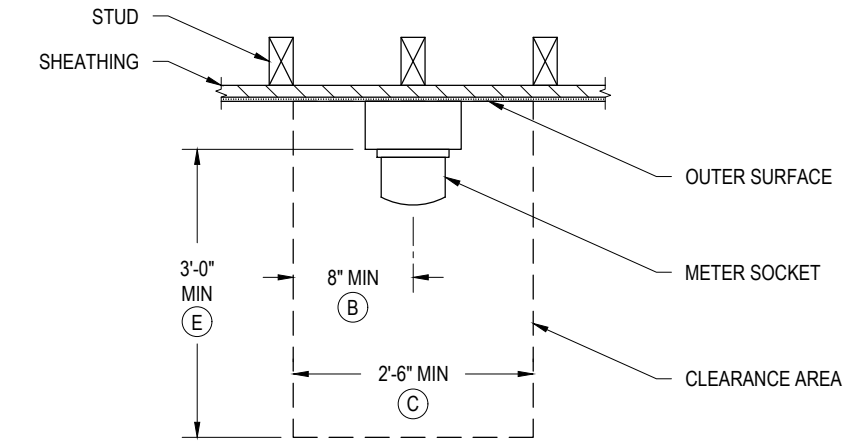
8.1 The installation and maintenance of service drops over swimming pools is to be avoided where practical.

8.2 The customer must contact a SMUD Engineering Designer to determine SMUD'S service requirements before installing a new pool or rewiring an existing installation where a SMUD service drop is over or shall cross within 10 feet of a pool.

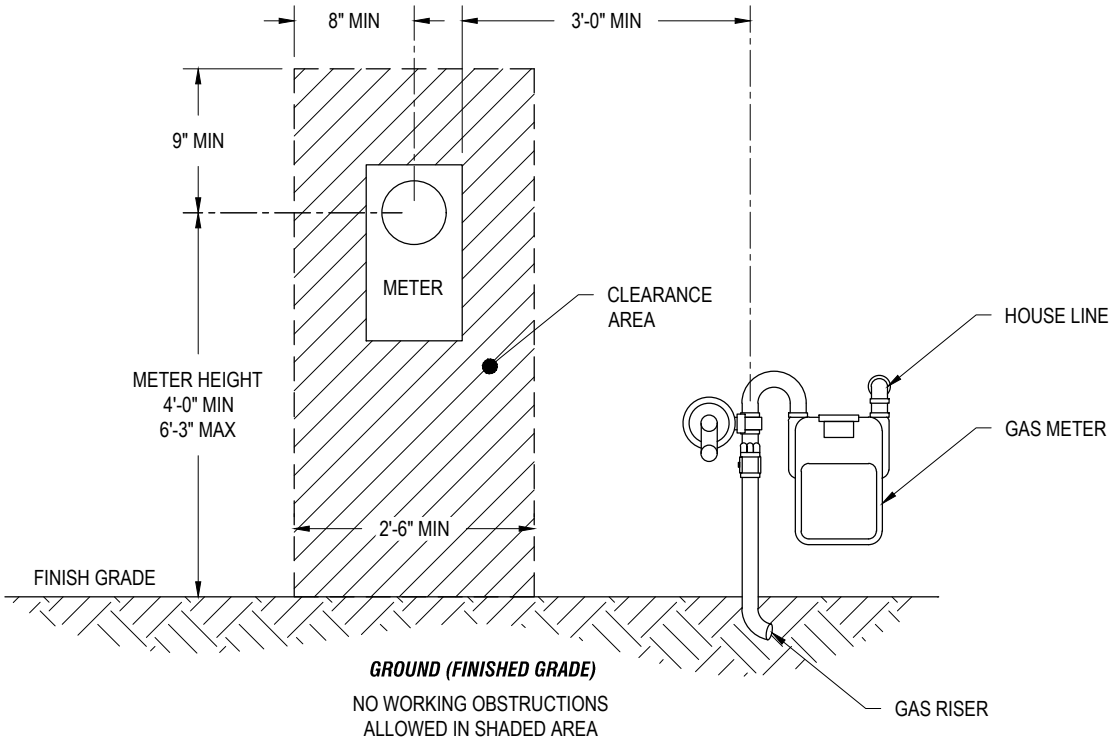
8.3 The clearances shown on Page A-25 are required in SMUD's Service Area.

Appendix A: Design and Construction Drawings

The customer and/or their representatives or contractors shall adhere to the design and construction drawings listed in the table below, unless otherwise specified in writing by a SMUD inspector or designer. The Customer shall review all drawings. Any questions or comments shall be brought to Sacramento Municipal Utility District's (SMUD) attention for clarification or resolution.



TOP VIEW



GROUND (FINISHED GRADE)

NO WORKING OBSTRUCTIONS
ALLOWED IN SHADED AREA

— — — — — — — — — INDICATES BOUNDARY OF AREA WHICH MUST BE KEPT CLEAR OF OBSTRUCTIONS.

NOTES:

A. A CLEARANCE AREA AROUND THE SOCKET MUST BE MAINTAINED AS SHOWN IN THE ILLUSTRATIONS.

(B.) THERE MUST BE AN 8" MIN HORIZONTAL & A 9" MIN VERTICAL (ABOVE) CLEARANCE BETWEEN THE CENTER OF THE METER SOCKET & ANY OBSTRUCTION. (NO OBSTRUCTIONS IN THE CLEARANCE AREA, SEE DRAWING ABOVE).

(C.) A LEVEL STANDING SPACE, AT LEAST 3'-0" L X 2'-6" W SHALL BE MAINTAINED IN FRONT OF THE METER SOCKET IN ORDER TO ALLOW FOR INSTALLATION, TESTING & READING (SEE ALSO C.6.G PAGE 7).

D. METERS SHALL BE LOCATED SO THAT THEY WILL NOT BE DAMAGED BY A SWINGING WINDOW, DOOR, OR GATE. FOR ANY DOOR OPENING, THE SURFACE OF THE WALL ON EITHER SIDE OF THAT DOOR FOR A DISTANCE EQUAL TO THE WIDTH OF THE DOOR IS UNACCEPTABLE AS A METER SPOT, OR A SUITABLE DOOR, WINDOW, OR GATE STOP WILL BE REQUIRED.

(E.) THE 3'-0" MINIMUM CLEARANCE MUST BE INCREASED TO 3'-6" ON ALL 277/480Y INSTALLATIONS WHERE A GROUNDED OBJECT WILL BE BEHIND A WORKMAN IN FRONT OF THE METER.

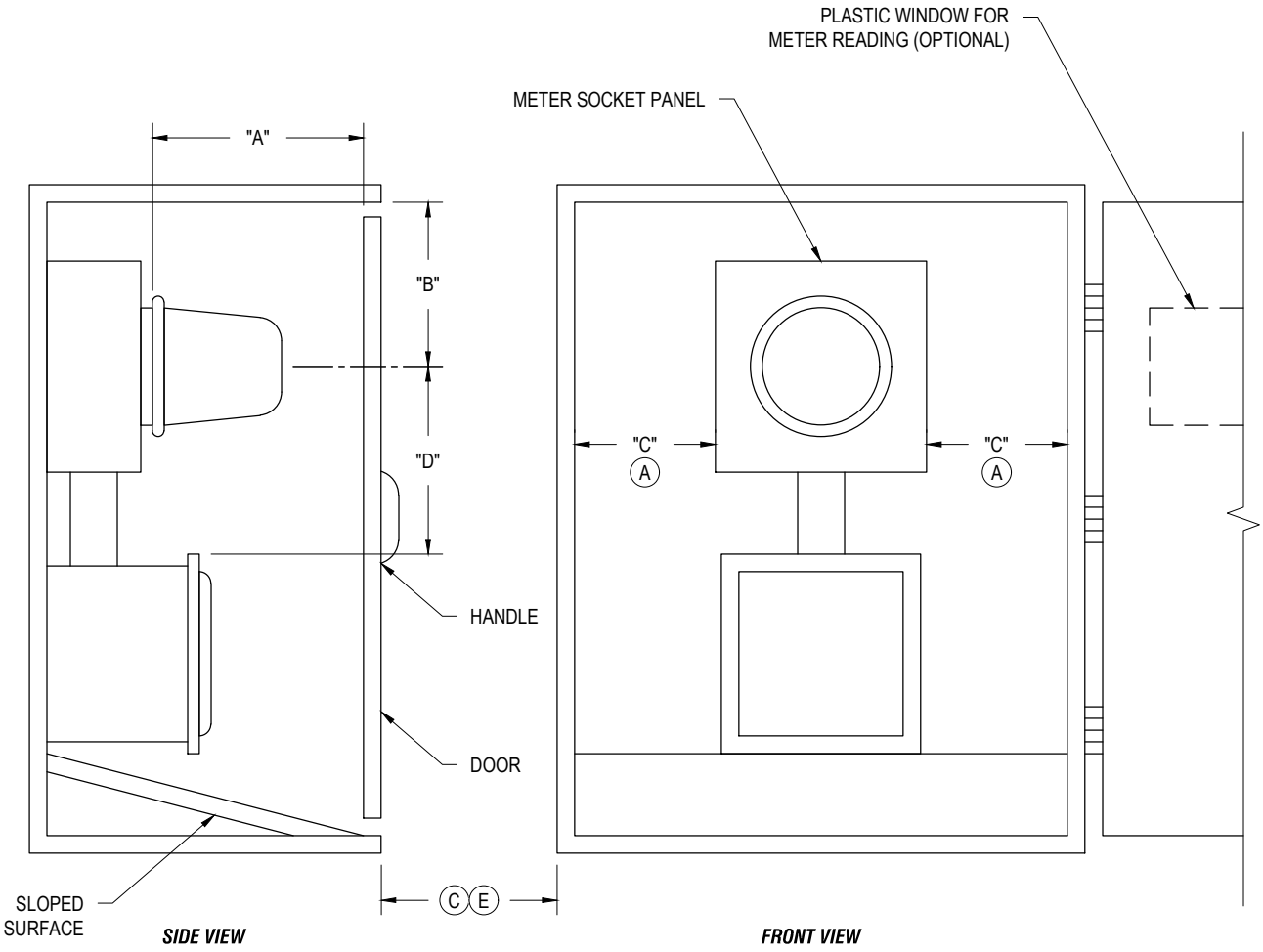
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-1

REV. DATE: APRIL 2025 REV. NO.: 4

REQUIRED MINIMUM CLEARANCES OF METER SOCKET FROM OBSTRUCTIONS

STANDARD NO.: ---



DIMENSION "A":
9" MINIMUM TO 1'-3" MAXIMUM FOR SINGLE-PHASE
11" MINIMUM TO 1'-3" MAXIMUM FOR POLY-PHASE.

DIMENSION "B":
7" MINIMUM FOR SINGLE-PHASE.
9" MINIMUM FOR POLY-PHASE.

DIMENSION "C":
10" MINIMUM.

DIMENSION "D":
8" MINIMUM.

NOTES:

(A.) METER SOCKETS, HAVING JAWS WHICH MUST BE TIGHTENED WITH A WRENCH, SHALL HAVE A MINIMUM "C" DIMENSION OF 10".
B. NEITHER ROOF NOR DOOR SUPPORTS SHALL INTERFERE WITH INSTALLATION OF THE METER.
(C.) WITH THE CABINET DOOR OPEN, A CLEAR WORKING SPACE OF AT LEAST 3'-0" IS REQUIRED DIRECTLY IN FRONT OF THE METER, IN ADDITION TO 1'-3" ON BOTH SIDES OF THE METER, MEASURED FROM THE ENCLOSURE.
D. WHEN THE CABINET DOOR IS LOCKABLE, A DOUBLE LOCK ARRANGEMENT IS REQUIRED.
(E.) THE 3'-0" MINIMUM WORKING CLEARANCE MUST BE INCREASED TO 3'-6" ON ALL 277/480Y INSTALLATIONS WHERE A GROUNDED OBJECT WILL BE BEHIND A WORKMAN IN FRONT OF THE METER.

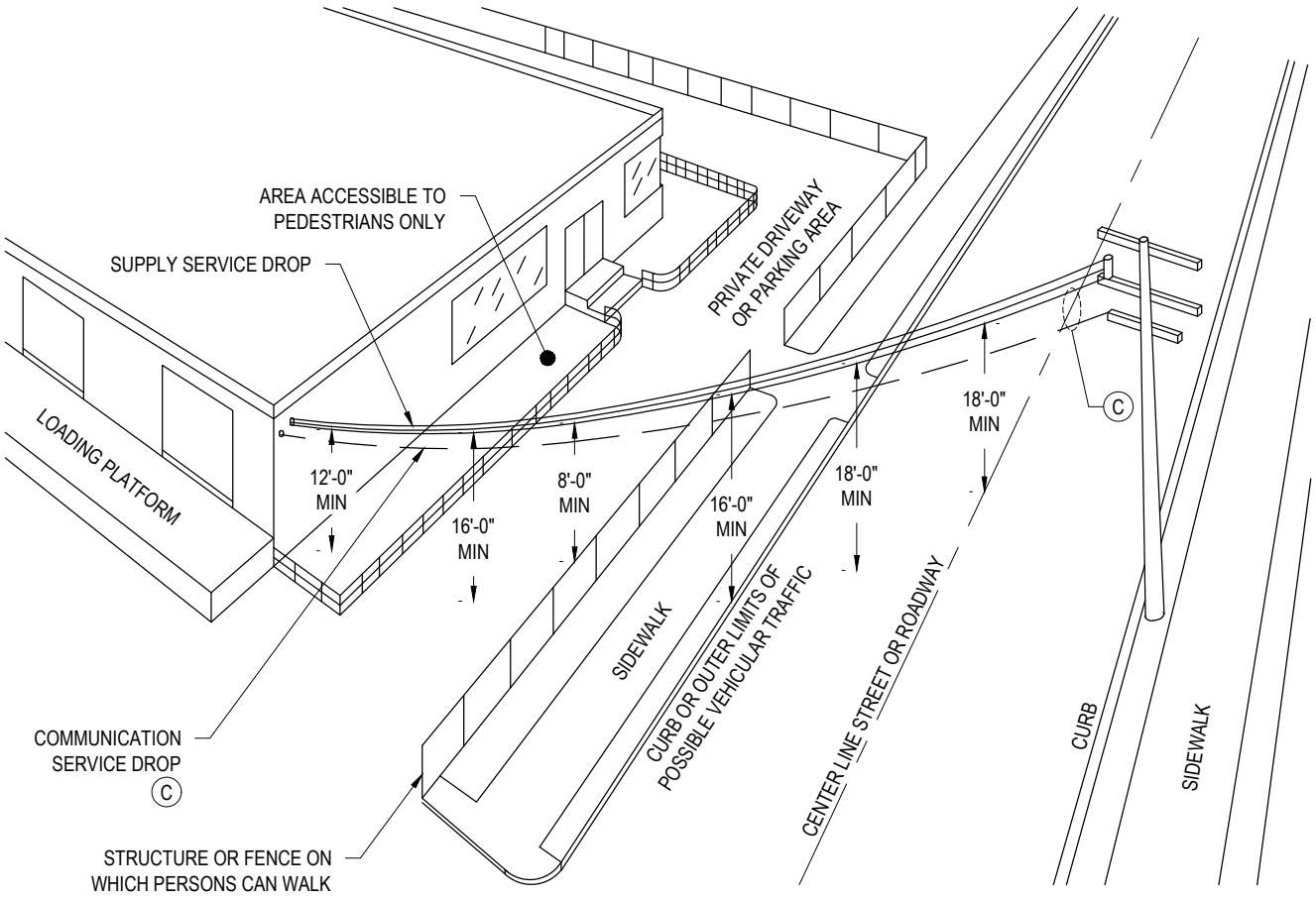
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-2

REV. DATE: APRIL 2025 REV. NO.: 4

CLEARANCES FOR COMMERCIAL METER CABINET ENCLOSURES

STANDARD NO.:



NOTES:

VERTICAL CLEARANCES ABOVE RAILS:

A.	CROSSING ABOVE RR TRACKS WITHOUT OVERHEAD TROLLEY WIRE	25'-0" MINIMUM
B.	CROSSING ABOVE RR TRACKS WITH OVERHEAD TROLLEY WIRE:	
	(A) ABOVE RAILS WHERE FREIGHT CARS ARE TRANSPORTED	26'-0" MINIMUM
	(B) ABOVE RAILS WHERE FREIGHT CARS ARE NOT TRANSPORTED	23'-0" MINIMUM
	(C) IN EACH CASE THE SERVICE DROP MUST CLEAR TROLLEY WIRES BY NOT LESS THAN	4'-0" MINIMUM

(C.) CLEARANCE BETWEEN THE SUPPLY SERVICE DROP & THE COMMUNICATION SERVICE DROP SHALL BE 2'-0" MINIMUM RADIALLY IF MORE THAN 15'-0" FROM THE POINT OF BUILDING ATTACHMENT OF EITHER SERVICE. IF LESS THAN 15'-0", THE MINIMUM CLEARANCE MUST BE 1'-0".

SMUD
Sacramento Municipal Utility District

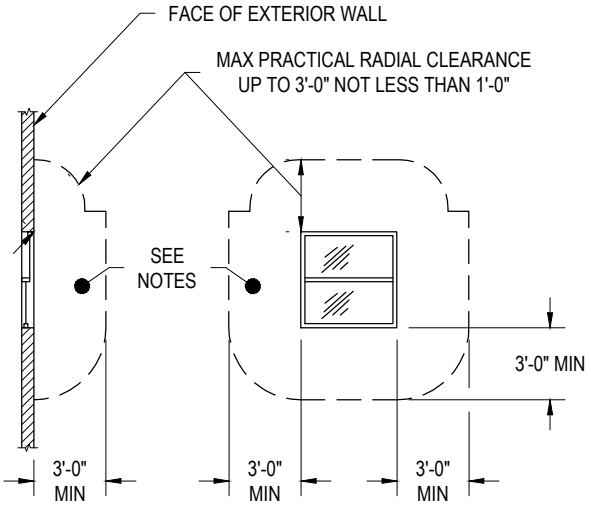
ESR: T004 ESR PG. NO.: A-3

REV. DATE: APRIL 205 REV. NO.: 4

GROUND CLEARANCE FOR SUPPLY DROPS, 0-750 VOLTS (COMMERCIAL & INDUSTRIAL PREMISES)

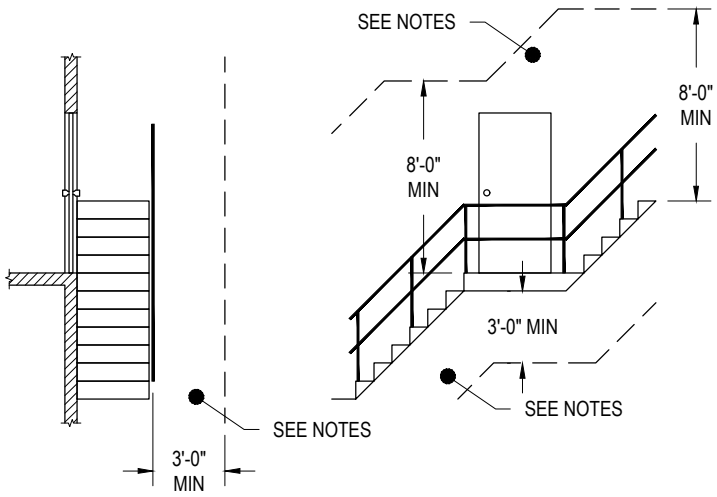
STANDARD NO.: ---

CLEARANCE FROM WINDOWS, DOORS, EXITS, ETC.



SIDE VIEW ***FRONT VIEW***

CLEARANCE FROM FIRE ESCAPES, STAIRWAYS, PORCHES, ETC.



SIDE VIEW ***FRONT VIEW***

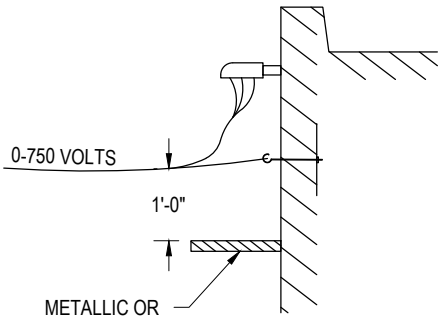
— — — — — — — INDICATES BOUNDARY OF CLEARANCE AREA THROUGH WHICH CONDUCTORS MUST NOT PASS

NOTES:

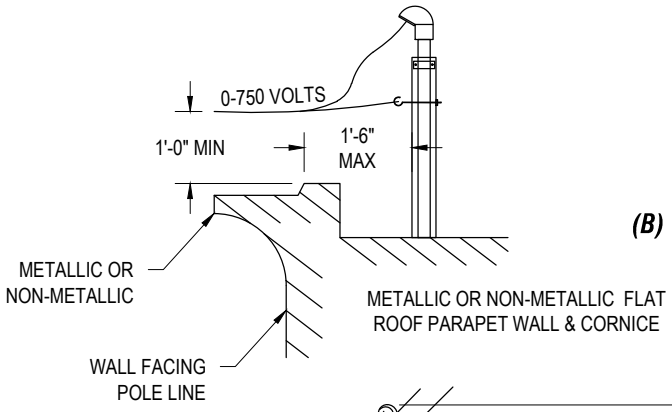
A. SERVICE WIRES SHOULD NOT BE ATTACHED TO THE BUILDING WALL WITHIN THE ABOVE CLEARANCE AREAS & SHOULD NOT PASS THROUGH CLEARANCE SPACE ILLUSTRATED IN THESE SKETCHES.

B. THE RULES FOR OVERHEAD LINE CONSTRUCTION, ISSUED BY THE CALIFORNIA PUBLIC UTILITIES COMMISSION, REQUIRE THAT:
   a. ALL PORTIONS OF THE SERVICE DROP SHALL HAVE A HORIZONTAL CLEARANCE OF 3'-0" FROM ANY EXIT, WINDOW, DOOR OR OTHER POINT AT WHICH HUMAN CONTACT MIGHT BE EXPECTED.
   b. SERVICE DROPS SHALL BE SO ARRANGED AS TO MINIMIZE HAMPERING & ENDANGERING WORKMEN & FIREMEN IN THE PERFORMANCE OF THEIR DUTIES. THIS IS INTERPRETED TO MEAN THAT SERVICE DROPS SHALL BE SO ARRANGED THAT A FIREMAN CAN PLACE A LADDER AGAINST ANY WINDOW WITHOUT INTERFERENCE OR DANGER.

C. SMUD WILL NOT BE RESPONSIBLE FOR ANY DAMAGE TO THE BUILDING CAUSED BY RAIN OR STRUCTURAL FAILURE.

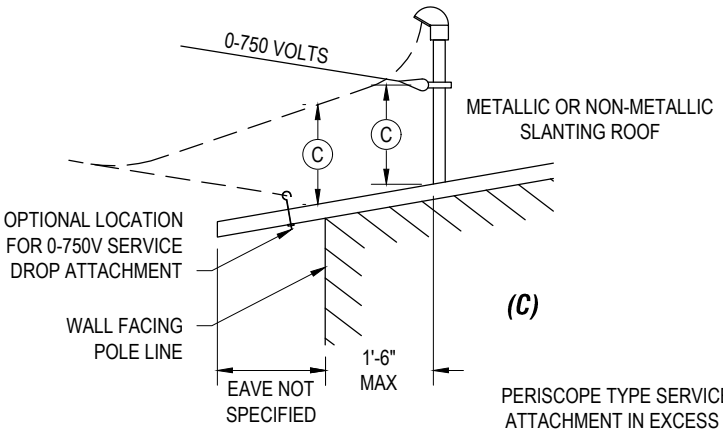


(A)

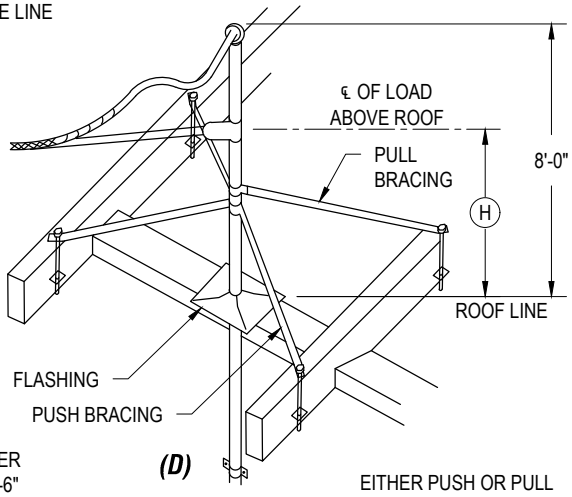


(B)

METALLIC OR NON-METALLIC FLAT
ROOF PARAPET WALL & CORNICE



(C)



(D)

TOP VIEW

PERISCOPE TYPE SERVICE RISER
ATTACHMENT IN EXCESS OF 2'-6"
(BRACING ILLUSTRATED)

EITHER PUSH OR PULL
BRACING MAY BE USED

NOTES:

A. SMUD WILL NOT BE RESPONSIBLE FOR ANY DAMAGE TO THE BUILDING CAUSED BY RAIN OR STRUCTURAL FAILURE.

B. WHERE A SMUD ENGINEERING DESIGNER SPECIFIES THAT THE SERVICE DROP IS TO BE 3 SINGLE WIRES, CLEARANCE BETWEEN THE SERVICE DROP CONDUCTORS MUST BE A MINIMUM OF 6". IF AN 8" MINIMUM BETWEEN POINTS OF ATTACHMENT DOES NOT PROVIDE THE NECESSARY 6" CLEARANCE BETWEEN WIRES, THE SEPARATION BETWEEN THE POINTS OF ATTACHMENT MUST BE INCREASED SUFFICIENTLY TO PROVIDE THE 6" CLEARANCE.

(C.) ON PREMISES USED FOR INDUSTRIAL OR COMMERCIAL PURPOSES, SERVICE DROPS SHALL BE MAINTAINED AT A VERTICAL CLEARANCE OF NOT LESS THAT 8'-0" OVER ALL OR ANY PORTIONS OF BUILDINGS & STRUCTURES, EXCEPT THAT SERVICE DROPS OF 0-750 VOLTS MAY BE LESS THAN 8'-0", BUT NOT LESS THAN 1'-0", ABOVE THE METALLIC OR NON-METALLIC CORNICE,DECORATIVE APPENDAGE, EAVE, ROOF OR PARAPET WALL OF THE BUILDING SERVICED PROVIDED WITH THE FOLLOWING:

a. THE CURRENT CARRYING CONDUCTORS ARE INSULATED FOR THE VOLTAGE BEING SUPPLIED.

b. THE POINT OF ATTACHMENT OF THE SERVICE DROP IS NOT MORE THAN 1'-6" BACK OF THE FRONT FACE OF THE BUILDING WALL FACING THE POLE LINE FROM WHICH THE SERVICE DROPS ORIGINATE.

EXCEPTIONS:

3'-0" CLEARANCE IF ROOF PITCH IS 4:12 OR STEEPER; OR ROOF NOT CAPABLE OF SUPPORTING A PERSON WALKING.

1'-6" IF VOLTAGE DOES NOT EXCEED 300V & NO MORE THAN 6'-0" OF CONDUCTORS, 4'-0" HORIZONTALLY, PASS ABOVE THE ROOF OVERHANG, & THEY ARE TERMINATED AT A THROUGH-THE-ROOF RACEWAY.

D. ALL SERVICE WIRES CROSSING OVER A ROOF MUST CLEAR THE ROOF BY 8'-0".

E. THE ABOVE METHODS OF SUPPORTING SERVICE DROPS MAY BE USED WHERE A ROOF OVERHANG IS EXPOSED. WHERE THE ROOF OVERHANG IS SEALED, THESE METHODS MAY ALSO BE USED IF THE SERVICE CONDUIT IS VERTICAL THROUGH A SEALED AREA. HORIZONTAL CONDUIT RUNS ARE NOT BE MADE IN A SEALED PORTION.

F. WHERE A SERVICE RISER PROJECTS THROUGH THE ROOF, THE SERVICE HEAD MUST BE A MINIMUM OF 1'-6" ABOVE THE ROOF LINE.

G. ALL SERVICE ATTACHMENTS SHALL BE CAPABLE OF WITHSTANDING A MINIMUM SERVICE PULL OF 600 POUNDS WITHOUT DAMAGE TO THE BUILDING STRUCTURE.

(H.) WHERE A PERISCOPE TYPE SERVICE RISER IS USED FOR SERVICE ATTACHMENT, THE SERVICE RISER MUST BE BRACED IF THE CENTER LINE OF THE LOAD EXCEEDS 2'-6" ABOVE THE ROOF. BRACING MUST BE OF RIGID CONDUIT WITH A BRACE KIT AS ILLUSTRATED IN FIGURE (D) ABOVE.

I. COUPLINGS OR SLEEVES WILL NOT BE PERMITTED IN THE PERISCOPE TYPE SERVICE RISER BETWEEN THE UPPERMOST POINT OF SERVICE ATTACHMENT & THE BOTTOM SUPPORT CLAMP.

J. LAG SCREWS ARE NOT ALLOWED IN ANY PORTION OF THE SERVICE ATTACHMENT.

K. CABLE TYPE GUYS ARE NOT ALLOWED FOR SERVICE ATTACHMENT SUPPORT.

L. CONSULT SMUD'S ENGINEERING DESIGNER FOR ANY OTHER POINTS OF ATTACHMENT.

SMUD
Sacramento Municipal
Utility District

ESR: T004 ESR PG. NO.: A-5

REV. DATE: APRIL 2025 REV. NO.: 4

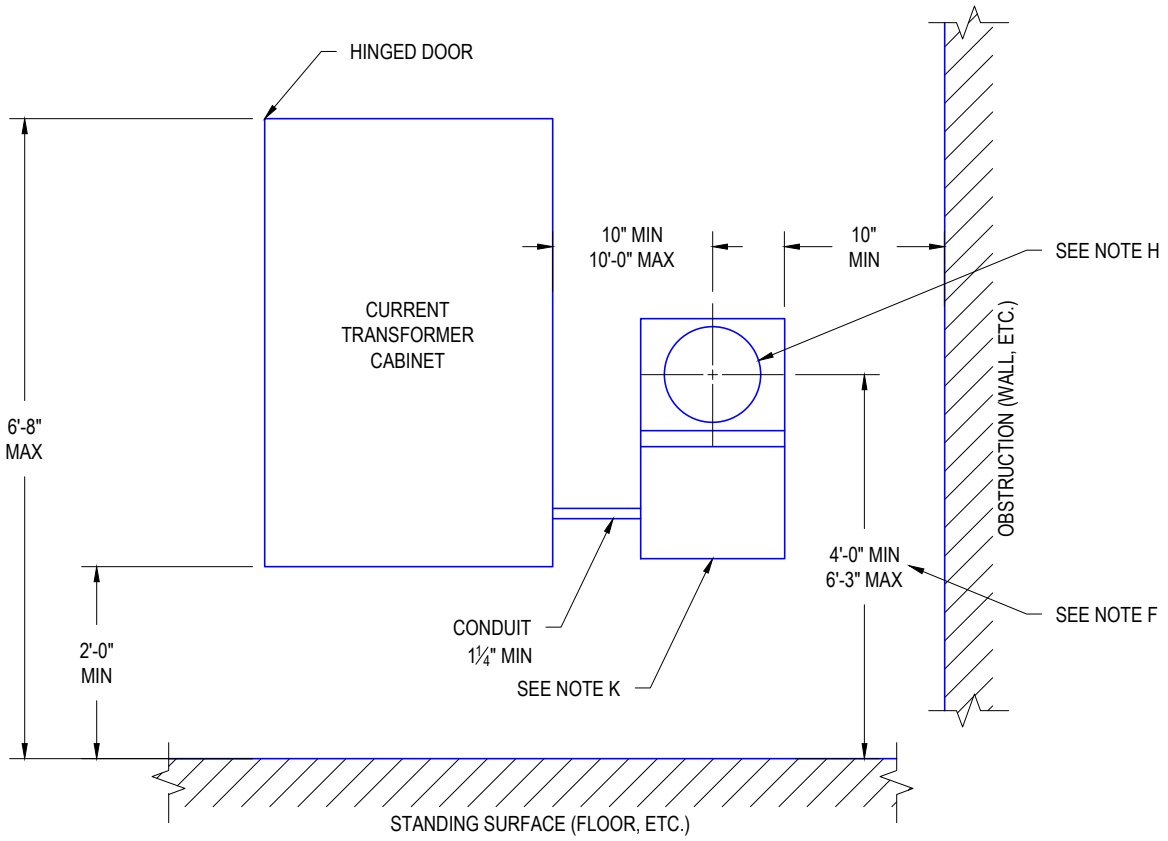
CLEARANCE OF 0-750 VOLTS SERVICE DROPS FROM BUILDING ON COMMERCIAL OR INDUSTRIAL PREMISES

STANDARD NO.:

			METER PANELS		CURRENT TRANSFER CABINET	
	TYPE OF SERVICE	NO. OF JAWS IN SOCKET	MILBANK CATALOG #	COOPER B-LINE CATALOG #	MILBANK CATALOG # ∑	COOPER B-LINE CATALOG # ∑
1Ø	3 WIRE, 120/240V DELTA	6	UC3436-XL	12146	CT303611-HC	304811 HRCT
3Ø	4 WIRE DELTA	13	UC3433-XL	121413	CT364811-HC	304811 HRCT
3Ø	4 WIRE WYE	13	UC3433-XL	121413	CT364811-HC	304811 HRCT

* NOTE: ALL ARE EXAMPLES OR CAN BE SIMILAR FROM ANOTHER MANUFACTURER

Σ NOTE: CT BUSSING FOR YOUR GIVEN SERVICE WILL BE REQUIRED AS WELL



DETAIL - 1
GENERAL ARRANGEMENT
CURRENT TRANSFORMER INSTALLATION

NOTES:

A. CABINET SHALL HAVE A HINGED DOOR.
B. THE NEUTRAL OR UNMETERED LEG SHALL BE CONTINUOUS.
C. THE DIRECTION OF FEED THROUGH THE CURRENT TRANSFORMER CABINET SHALL BE VERTICAL.
D. FOR OUTDOOR INSTALLMENTS, A RAINTIGHT TRANSFORMER CABINET AND A RAINTIGHT METER ENCLOSURE ARE NECESSARY.
E. FOR DETAILS OF CURRENT TRANSFORMER CABINET SEE PAGES (A-9, A-13, A-14).
F. A CLEAR WORKING SPACE OF AT LEAST 42" MUST EXTEND FROM THE SURFACE ON WHICH THE METERING EQUIPMENT IS MOUNTED.
G. THE METER HEIGHT MAY BE REDUCED TO 36" WHEN IN A METER ROOM OR AN APPROVED CABINET.
H. THE CUSTOMER SHALL FURNISH AND INSTALL A METER SOCKET(S) AND A METAL CABINET FOR HOUSING THE METERING CURRENT TRANSFORMERS IN ACCORDANCE WITH THE SPECIFICATION SHOWN. ALL METER SOCKETS SHALL BE RING TYPE.
I. DISTANCE FROM UTILITY SERVICE METER AND CT CABINET SHALL BE LESS THAN 120" AND WITHIN SIGHT OF EACH OTHER.
J. SEE ESR T-004 DRAWING A-1 FOR WORK SPACE REQUIREMENTS.
K. METER PANEL SHALL HAVE PROVISION FOR TEST SWITCH UNDER COVER. REFER TO COOPER B-LINE 121413 OR SIMILAR TO ANOTHER MANUFACTURER.

*NOTE: REFER TO PAGES A-27 & A-28 FOR NUMBER OF JAWS IN METER SOCKET.

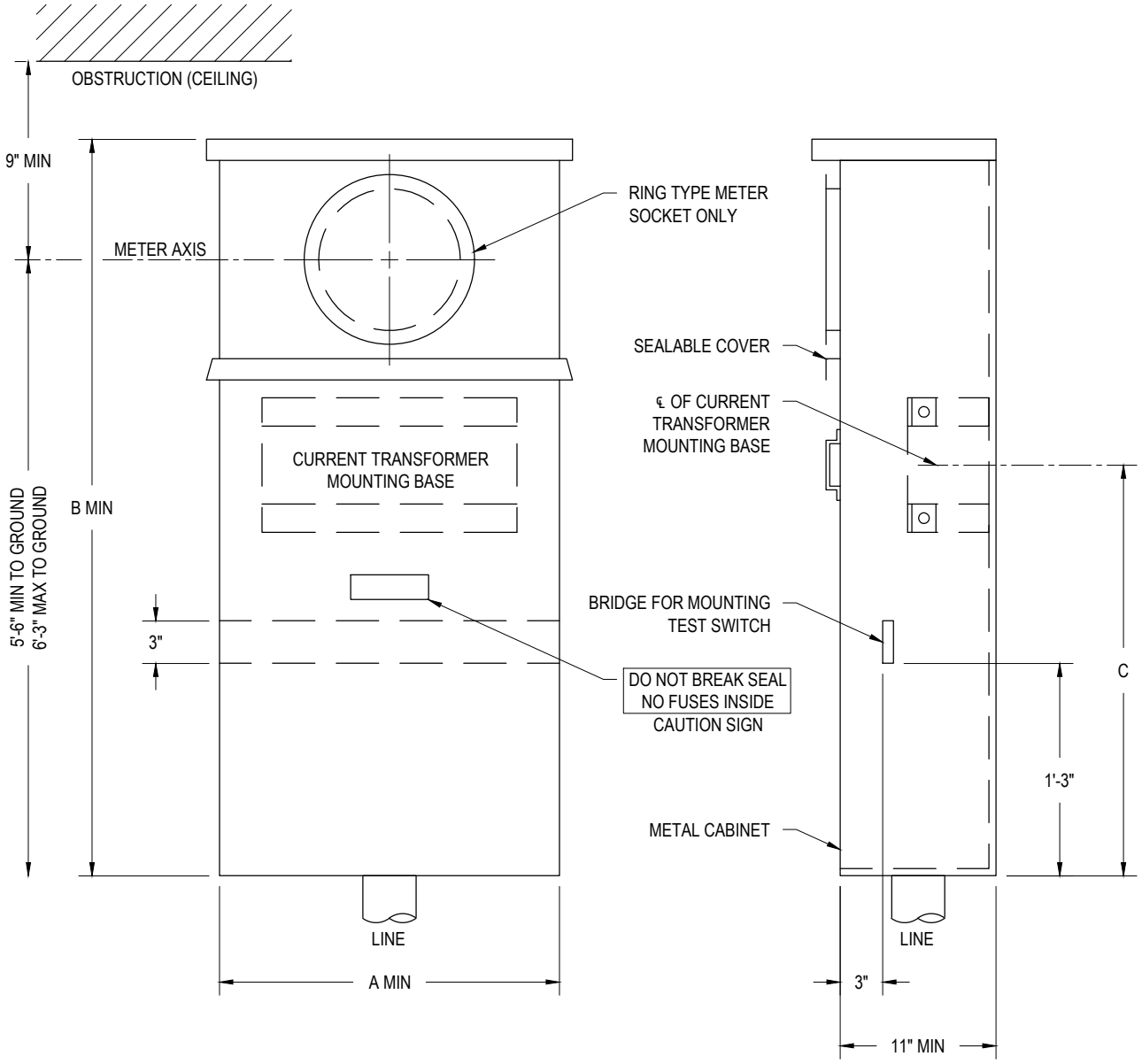


TABLE - 1

MINIMUM DIMENSIONS				TRANSFORMER MOUNTING BASE	MAXIMUM WIRE SIZE	USE
CABINET	A	B	C			
2'-0" X 4'-4" X 11"	2'-0"	4'-4"	2'-5"	DET A PG A-9	500,000 (A)	1Ø (B)
3'-0" X 4'-4" X 11"	3'-0"	4'-4"	2'-5"	DET C PG A-9	500,000 (A)	3Ø (C)

NOTES:

(A.) *CONDUCTORS LARGER THAN 500MCM SHALL NOT BE INSTALLED EXCEPT WHEN REQUIRED BY CODE OR ORDINANCE FOR 800 AMPERE CAPACITY.
(B.) ANY SERVICE OVER 200 AMP, SINGLE PHASE, REQUIRES AUTHORIZATION OF SMUD'S ENGINEERING DESIGNER. IN NO CASE, WILL SMUD PROVIDE OVER 100 KVA TO ANY SINGLE CUSTOMER AT SINGLE PHASE, 3-WIRE (417 AMPS).
(C.) CHECK WITH SMUD'S ENGINEERING DESIGNER FOR AVAILABILITY OF 120/240V, 3Ø, DELTA SERVICE.
D. NOT TO BE USED ON 277/480 VOLT SERVICE.

SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-7

REV. DATE: APRIL 2025 REV. NO.: 5

COMBINATION METER & CURRENT TRANSFORMER CABINET, 201-800 AMPERES (UNDERGROUND SERVICE) 120/240 & 120/208 VOLT SERVICE

STANDARD NO.: ---

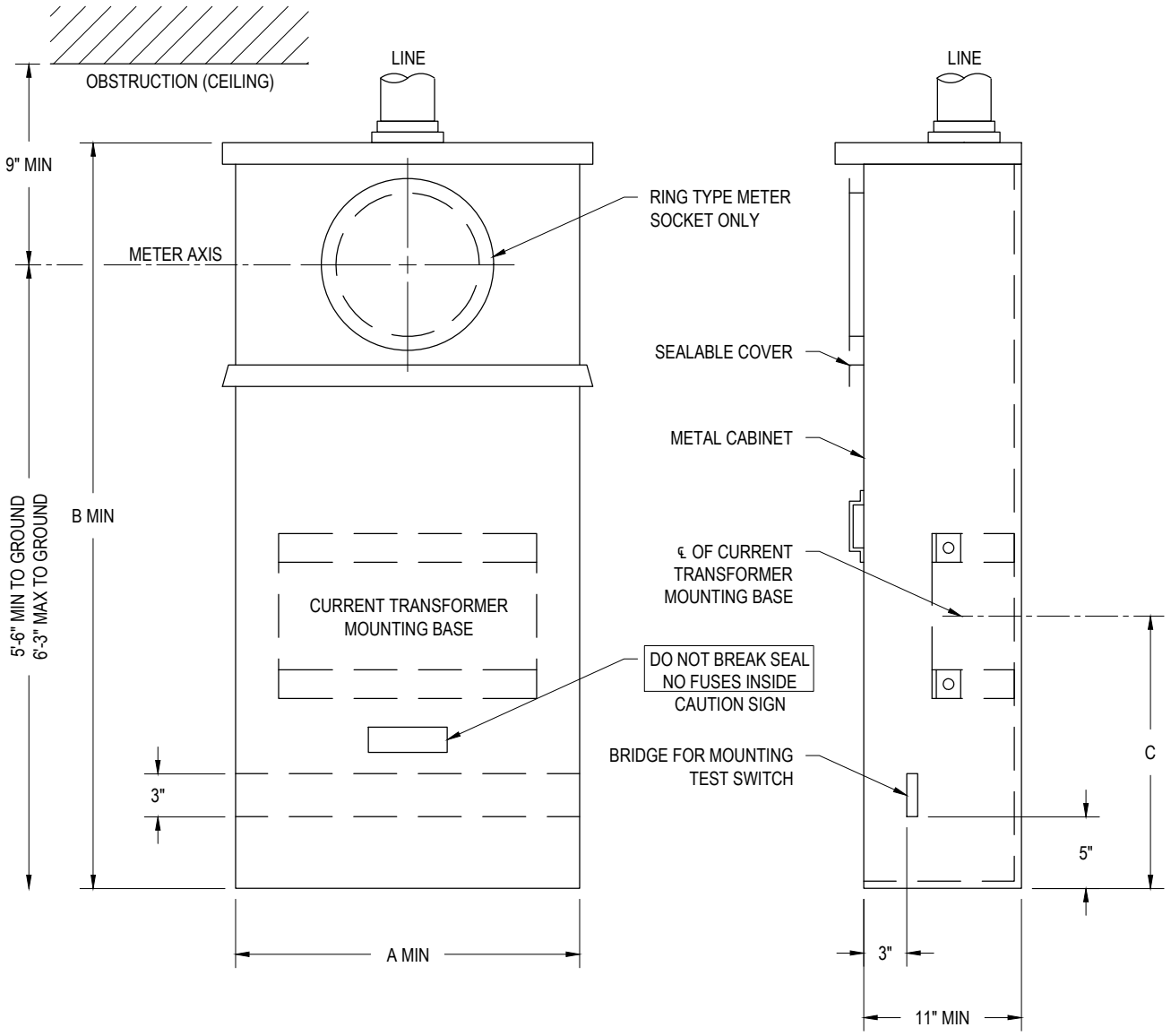


TABLE - 1

MINIMUM DIMENSIONS				TRANSFORMER MOUNTING BASE	MAXIMUM WIRE SIZE	USE
CABINET	A	B	C			
3'-0" X 3'-6" X 11"	3'-0"	3'-6"	1'-7"	DET C PG A-9	500,000 (A)	3Ø (C)
2'-0" X 3'-6" X 11"	2'-0"	3'-6"	1'-7"	DET A PG A-9	500,000 (A)	1Ø (B)

NOTES:

(A.) *CONDUCTORS LARGER THAN 500MCM SHALL NOT BE INSTALLED EXCEPT WHEN REQUIRED BY CODE OR ORDINANCE FOR 800 AMPERE CAPACITY.
(B.) ANY SERVICE OVER 200 AMP, SINGLE PHASE, REQUIRES AUTHORIZATION OF SMUD'S ENGINEERING DESIGNER.
(C.) CHECK WITH SMUD'S ENGINEERING DESIGNER FOR AVAILABILITY OF 120/240V, 3Ø, DELTA SERVICE.
D. NOT TO BE USED ON 277/480 VOLT SERVICE.

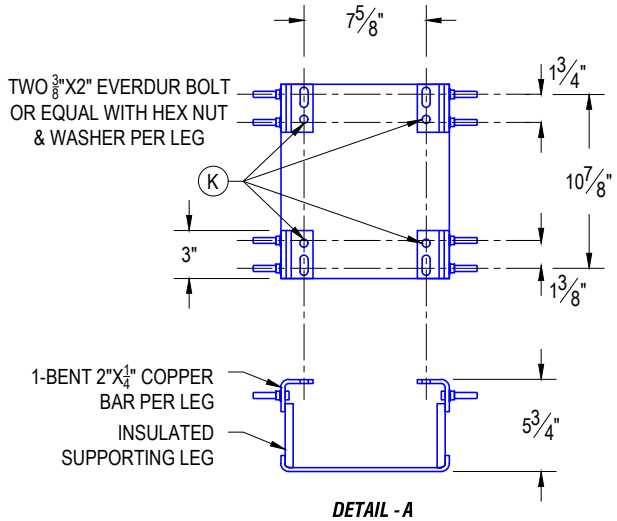
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-8

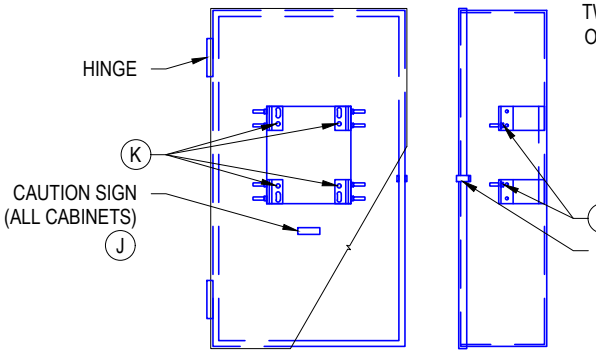
REV. DATE: APRIL 2025 REV. NO.: 5

COMBINATION METER & CURRENT TRANSFORMER CABINET, 201-400 AMPERES OVERHEAD SERVICE) 120/240 & 120/208 VOLT SERVICE

STANDARD NO.: ---

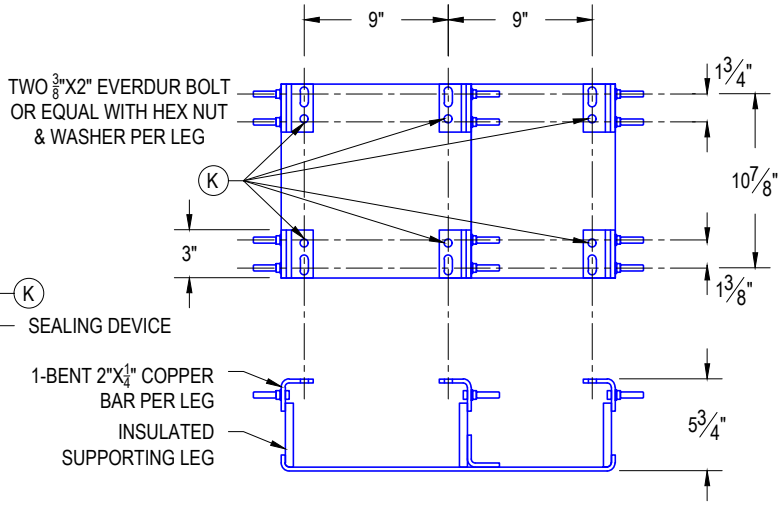


DETAIL - A
MOUNTING BASE FOR TWO CURRENT TRANSFORMERS



FRONT VIEW ***SIDE VIEW***

DETAIL - B
CABINET SHOWING HINGED, FLANGED COVER



DETAIL - C
MOUNTING BASE FOR THREE CURRENT TRANSFORMERS

TYPE OF SERVICE	MOUNTING BASE
SINGLE PHASE	TWO CURRENT TRANSFORMER BASE
THREE PHASE	THREE CURRENT TRANSFORMER BASE

NOTES:

A. THE COVER SHALL BE SEALABLE.
B. THE COVER SHALL NOT BE ATTACHED BY MEANS OF SCREWS.
C. A HINGED COVER SHALL BE USED, PROVIDED THERE IS PROPER CLEARANCE TO OPEN THE COVER WHEN THE CABINET IS INSTALLED. DOOR SHALL OPEN AT LEAST 90°.
D. WHEN EXPOSED TO WEATHER, THE CABINET SHALL BE RAINTIGHT.
E. THE CUSTOMER SHALL FURNISH LUGS & CONNECT CABLE TO THE CURRENT TRANSFORMER MOUNTING BASE.
F. WHEN SERVICE IS 4-WIRE DELTA, CONNECT THE POWER LEG TO THE CURRENT TRANSFORMER MOUNTING BASE.
G. THE GROUNDING LUG SHALL BE PROVIDED BY SMUD.
H. NO CONNECTION SHALL BE MADE IN ANY INSTRUMENT TRANSFORMER CABINET TO SUPPLY ANY OTHER METER, & NOT MORE THAN ONE LOAD CIRCUIT SHALL LEAVE ANY SUCH CABINET, EXCEPT WHEN REQUIRED BY SMUD.
I. ANY SERVICE OVER 200 AMPERES, SINGLE PHASE, REQUIRES AUTHORIZATION OF SMUD'S ENGINEERING DESIGNER.
(J.) DO NOT BREAK SEALS. NO FUSE INSIDE.
(K.) BUS UNITS SHALL BE PROVIDED WITH A FIXED STUD FOR MOUNTING THE CURRENT TRANSFORMERS. EACH SHALL:
   a. CONSIST OF 1/2" STEEL BOLT & SHALL BE PROVIDED WITH A SPRING WASHER & A NUT. THE SPRING WASHER MAY BE EITHER A CONE TYPE (BELLVILLE) WASHER OR A SPLIT-RING WASHER & FLAT WASHER. ALL PARTS SHALL BE PLATED TO PREVENT CORROSION.
   b. BE SECURED IN PLACE. "SECURED IN PLACE" SHALL MEAN THAT THE STUD WILL NOT TURN, BACK OUT OR LOOSEN IN ANY MANNER WHEN TIGHTENING OR LOOSENING THE ASSOCIATED NUTS (INCLUDING CROSS-THREADED SITUATIONS).

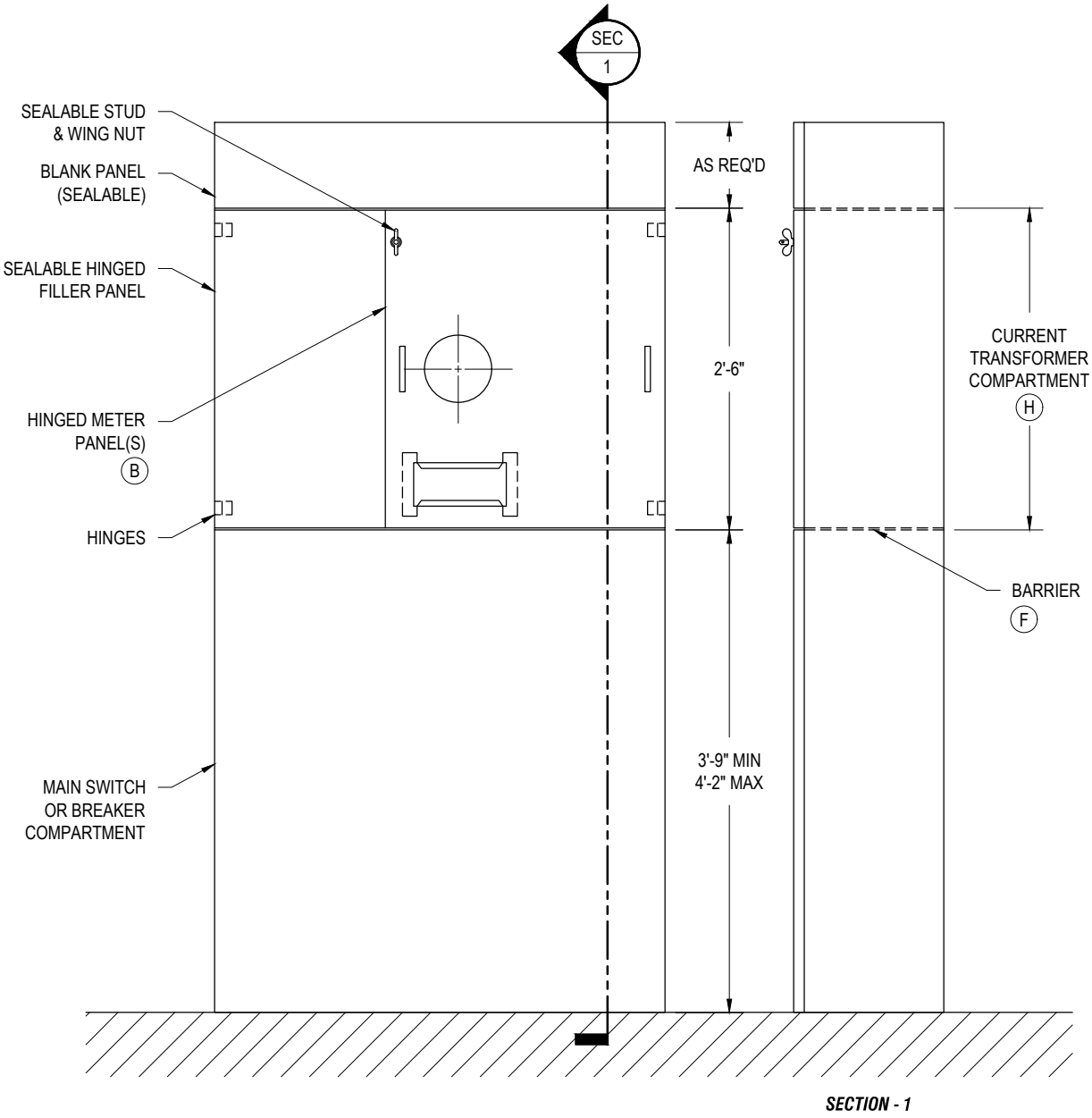
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-9

REV. DATE: APRIL 2025 REV. NO.: 2

MOUNTING BASE FOR TWO CURRENT TRANSFORMERS CABINET SHOWING HINGED, FLANGED COVER MOUNTING BASE FOR THREE CURRENT TRANSFORMERS

STANDARD NO.: ---



SECTION - 1

NOTES:

A. FILLER PANELS SHALL BE USED WHERE THE SWITCHBOARD WIDTH EXCEEDS THE METER PANEL WIDTH.
B. THE FILLER PANEL & METER PANEL SHALL BE HINGED, REVERSIBLE, INTERCHANGEABLE & SEALABLE.
C. WHEN ONLY ONE METER PANEL IS FURNISHED, IT SHALL BE MOUNTED IN THE LOWER POSITION.
D. THE METER PANEL SHALL HAVE A HANDLE(S) ATTACHED. SEE PAGES A-11 & A-12.
E. HINGES SHALL BE READILY INTERCHANGEABLE, RIGHT OR LEFT, ON THE JOB SITE. WHEN CLEVIS TYPE OR REMOVABLE PIN TYPE HINGES ARE USED, PROVISION SHALL BE MADE FOR REMOVING THE PIN FROM THE TOP WITHOUT REMOVING THE ADJACENT PANEL.
F. THE BARRIER SHALL BE OF INSULATING, NONTRACKING MATERIAL & HAVE A MINIMUM OF 24 VENT HOLES OF $\frac{3}{8}$" DIAMETER.
G. THE GROUNDING CONNECTION SHALL BE MADE IN THE MAIN SWITCH OR BREAKER COMPARTMENT.
H. MUST MEET EUSERC STANDARDS.
I. SEE PAGE A-26 FOR OUTDOOR COMMERCIAL METER CLEARANCE.

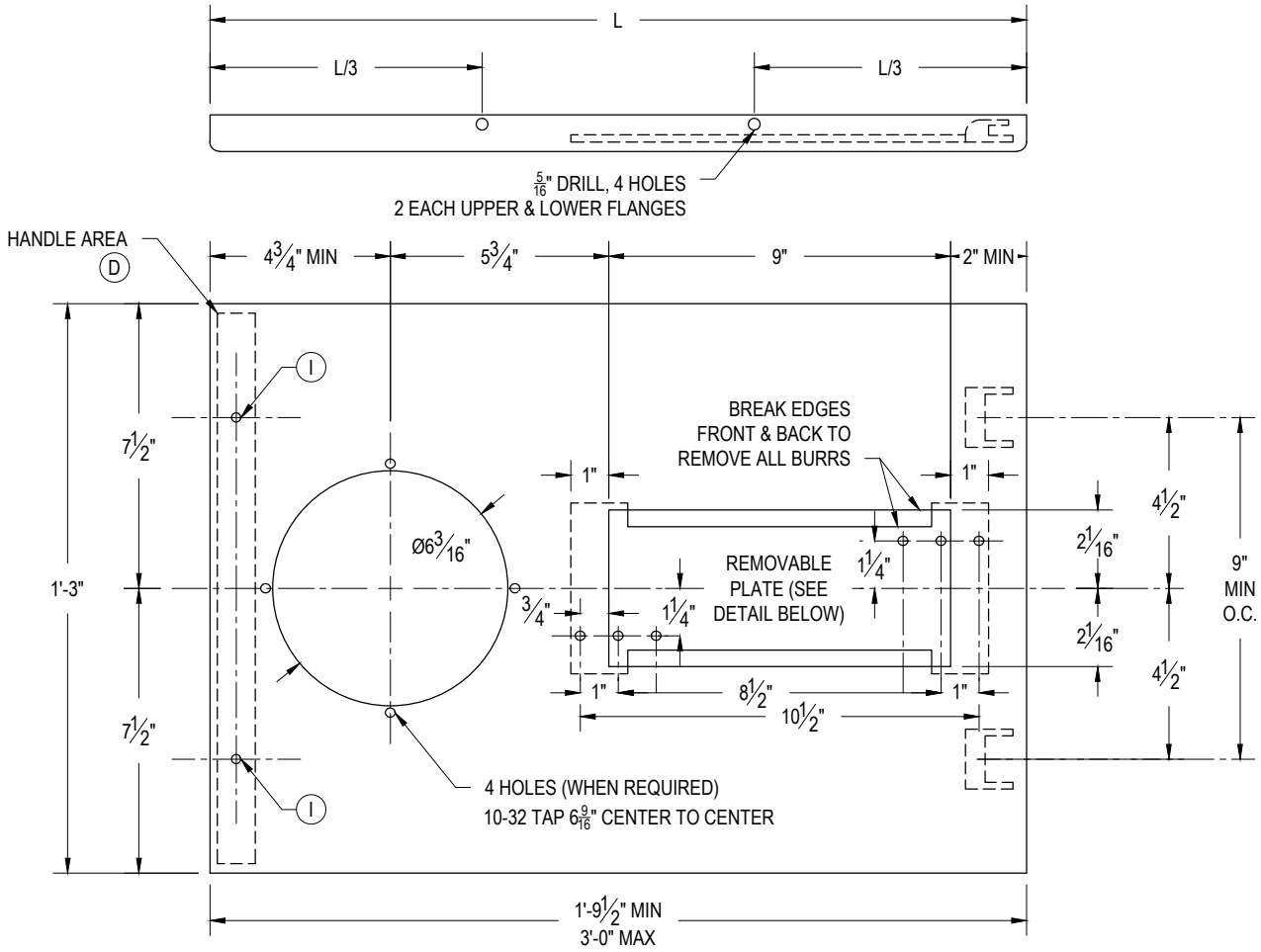
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-10

REV. DATE: APRIL 2025 REV. NO.: 5

SWITCHBOARD SERVICE SECTION WITH FILLER PANEL, 0-600 VOLTS

STANDARD NO.: ---



NOTES:

A. SWITCHBOARD MANUFACTURER SHALL DRILL, TAP & SLOT THE PANEL AS SHOWN FOR SECONDARY TEST SWITCHES & SHALL FURNISH & INSTALL SOCKETS COMPLETE WITH SEALING RINGS.

B. METER SOCKETS INSTALLED ON HINGED PANELS SHALL BE DESIGNED FOR BACK CONNECTION.

C. METER PANELS SHALL BE CONSTRUCTED OF 12 GAUGE STEEL (MINIMUM) & SHALL BE HINGED, REVERSIBLE, SEALABLE & INTERCHANGEABLE.

(D.) A HANDLE SHALL BE ATTACHED AT THE UNSUPPORTED END OF THE METER PANEL WITH A MINIMUM RADIAL CLEARANCE OF 1" FROM THE METER SOCKET OR REMOVABLE PLATE SECTION.

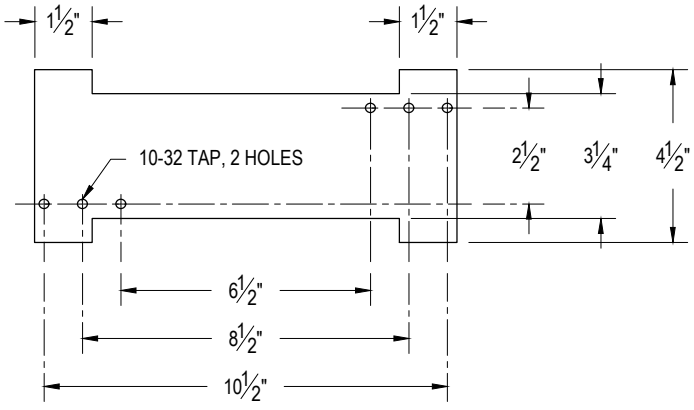
E. HINGES MUST SUPPORT A 25 POUND LOAD APPLIED AT THE UNSUPPORTED END WITH 1/8" MAXIMUM SAG WHEN OPEN.

F. HINGES SHALL BE READILY INTERCHANGEABLE, RIGHT TO LEFT, ON THE JOB SITE.

G. A REMOVABLE PLATE SHALL BE SECURED TO THE REAR OF THE PANEL BY SCREWS OF SUCH LENGTH THAT THEY DO NOT PROTRUDE THROUGH THE FACE OF THE PANEL.

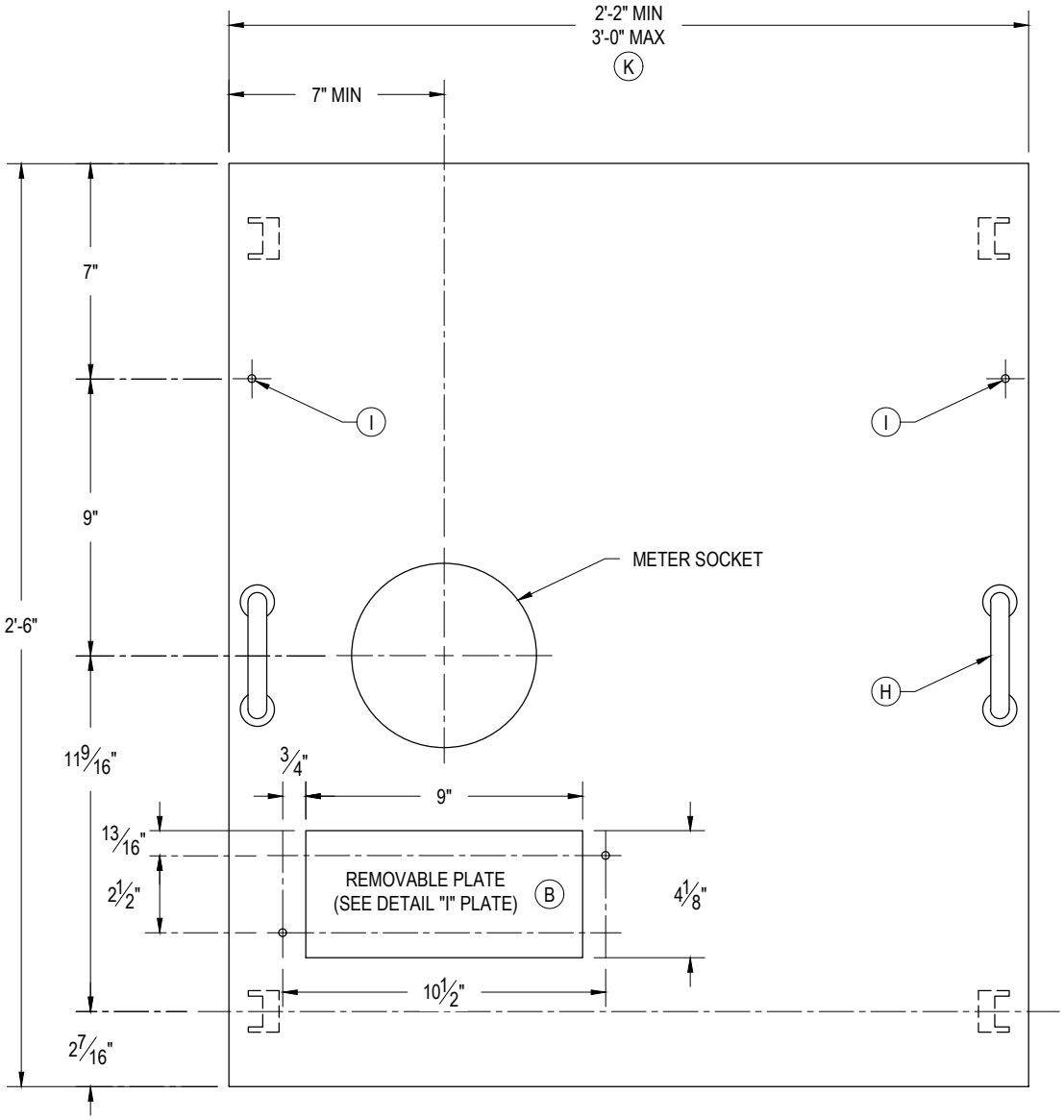
H. METER PANELS SHALL BE CAPABLE OF BEING OPENED 90° WITH METER & TEST FACILITIES IN PLACE.

(I.) ALL SECURING SCREWS & SEALING SCREWS ON THE PANEL SHALL BE CAPTIVE. WHEN USED, STUDS & WING NUTS SHALL BE SEALABLE.



REMOVABLE PLATE

SMUD Sacramento Municipal Utility District	ESR: T004	ESR PG. NO.: A-11	REV. DATE: APRIL 2025 / REV. NO.: 5
	HINGED SOCKET METER PANEL		STANDARD NO.: ---
			PAGE 1 OF 1



NOTES:

A. THE SWITCHBOARD MANUFACTURER SHALL DRILL, TAP & SLOT THE PANEL AS SHOWN & SHALL FURNISH & INSTALL SOCKETS COMPLETE WITH SEALING RINGS. ALL HOLES ARE #10-32 TAP, EXCEPT AS NOTED.

(B.) REMOVABLE PLATES SHALL BE PAINTED & ATTACHED TO THE PANEL.

C. METER PANELS SHALL BE CONSTRUCTED OF 12 GAUGE STEEL (MINIMUM) & SHALL BE HINGED & SEALABLE.

D. HINGES SHALL BE READILY INTERCHANGEABLE, RIGHT OR LEFT, ON THE JOB SITE. WHEN CLEVIS TYPE OR REMOVABLE PIN TYPE HINGES ARE USED, PROVISION SHALL BE MADE FOR REMOVING THE PIN FROM THE TOP.

E. HINGES MUST SUPPORT A 25 POUND LOAD APPLIED AT THE UNSUPPORTED END WITH $\frac{1}{8}$" MAXIMUM SAG WHEN OPEN.

F. THE HINGED METER PANEL SHALL NOT BE HINGED TO A FILLER PANEL.

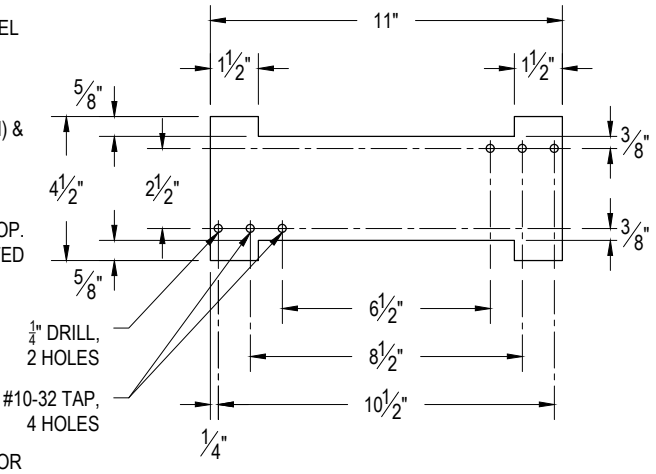
G. THE HINGED METER PANEL SHALL BE CAPABLE OF BEING OPENED 90 DEGREES WITH METER & TEST FACILITIES IN PLACE.

(H.) THE PANEL SHALL HAVE A HANDLE ATTACHED TO BOTH SIDES.

(I.) ALL SECURING SCREWS & SEALING SCREWS ON THE PANEL SHALL BE CAPTIVE. WHEN USED, STUD & WING NUTS SHALL BE SEALABLE.

J. METER SOCKETS INSTALLED ON HINGED PANELS SHALL BE DESIGNED FOR BACK CONNECTION.

(K.) FOR PANEL WIDTH LESS THAN 2'-2", CONSULT SMUD.



DETAIL "I" PLATE

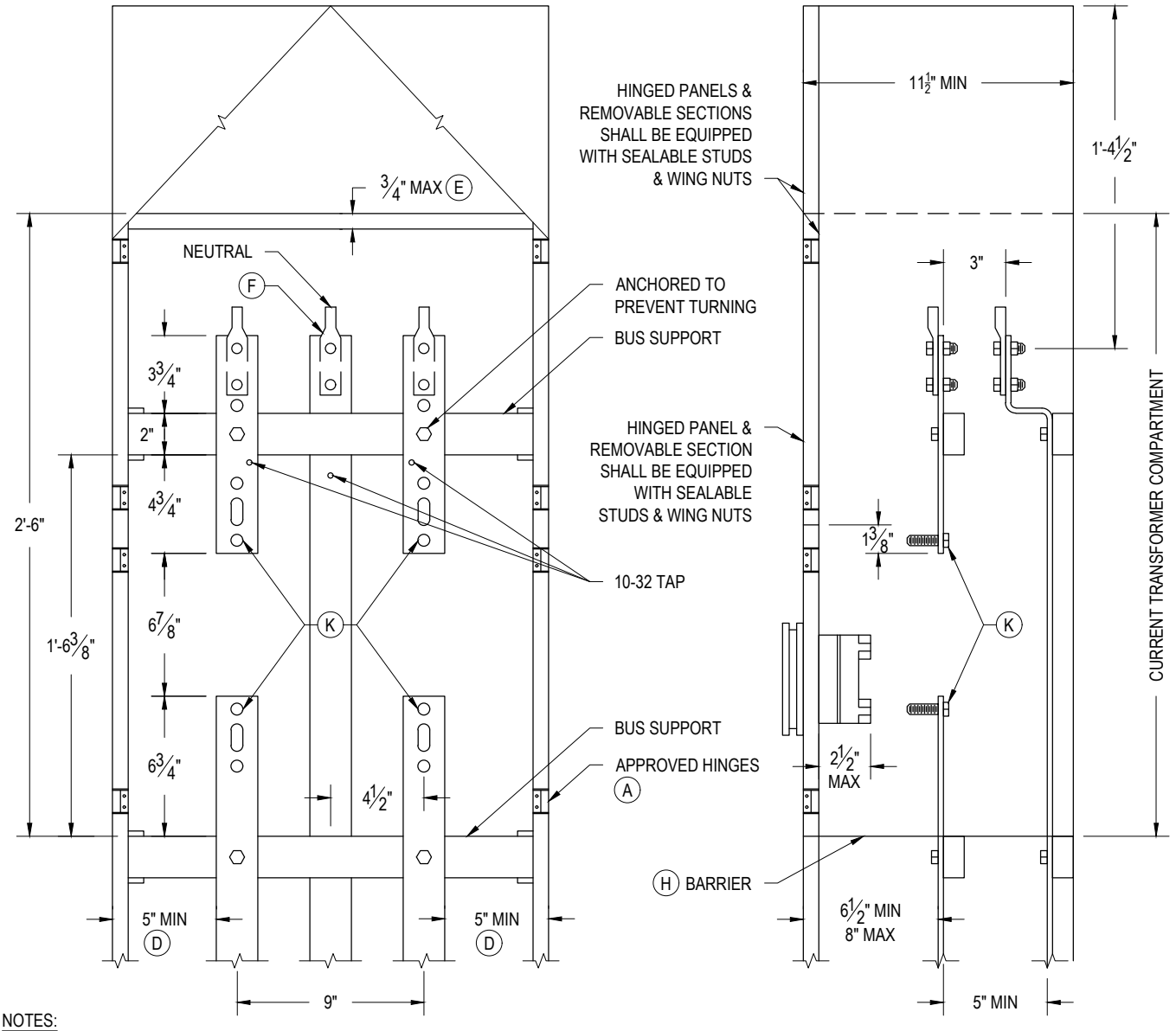
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-12

REV. DATE: APRIL 2025 REV. NO.: 5

HINGED SOCKET METER & DEMAND RECORDER PANEL

STANDARD NO.: ---



NOTES:

(A.) THE STATIONARY PORTION OF THE HINGES SHALL BE ATTACHED TO BOTH SIDES OF THE SWITCHBOARD IN ORDER TO PERMIT READY INTERCHANGEABILITY OF HINGED PANELS TO THE RIGHT OR LEFT SIDE.

B. THE COMPARTMENT SHALL BE ON THE SUPPLY SIDE OF THE MAIN SWITCH OR BREAKER.

C. THE DIRECTION OF FEED SHALL BE VERTICAL, & NO OTHER CONDUCTORS SHALL PASS THROUGH THIS COMPARTMENT.

(D.) THE CLEARANCE TO THE SIDE OF EACH COMPARTMENT SHALL BE INCREASED BY THE AMOUNT BY WHICH THE CORNER ANGLE EXCEEDS 1".

(E.) RETURN FLANGES FOR THE LOWER & UPPER METAL PANEL SUPPORT SHALL NOT PROJECT MORE THAN ¾" UP OR DOWN FROM THE ADJACENT SWITCHBOARD PANELS.

(F.) EACH BUS SHALL HAVE A CONNECTOR THAT WILL ACCEPT STRANDED CONDUCTORS HAVING THE AMPERE CAPACITY OF THE MAIN SWITCH OR BREAKER.

G. THE NEUTRAL MAY BE LOCATED ON THE SIDE WALL OR AT EITHER SIDE.

(H.) THE BARRIER SHALL BE OF INSULATING, NON-TRACKING MATERIAL & HAVE A MINIMUM OF 24 VENT HOLES OF ¾" DIAMETER.

I. THE BUS DIMENSIONS SHALL BE A MAXIMUM OF ¾" X 2" & A MINIMUM OF ¼" X 2" WHEN A LAMINATED BUS IS USED, THERE SHALL BE NO SPACE BETWEEN LAMINATIONS IN THE CURRENT TRANSFORMER COMPARTMENT.

J. ANY SERVICE OVER 200 AMP, SINGLE PHASE, REQUIRES AUTHORIZATION OF SMUD'S ENGINEERING DESIGNER. IN NO CASE, WILL SMUD PROVIDE OVER 100 KVA TO ANY SINGLE CUSTOMER AT SINGLE PHASE, 3-WIRE (417 AMPS).

(K.) BUS UNITS SHALL BE PROVIDED WITH A FIXED STUD FOR MOUNTING THE CURRENT TRANSFORMERS. EACH SHALL:

a. CONSIST OF ½" STEEL BOLT & SHALL BE PROVIDED WITH A SPRING WASHER & A NUT. THE SPRING WASHER MAY BE EITHER A CONE TYPE (BELLVILLE) WASHER OR A SPLIT-RING WASHER & FLAT WASHER. ALL PARTS SHALL BE PLATED TO PREVENT CORROSION.

b. BE SECURED IN PLACE. "SECURED IN PLACE" SHALL MEAN THAT THE STUD WILL NOT TURN, BACK OUT OR LOOSEN IN ANY MANNER WHEN TIGHTENING OR LOOSENING THE ASSOCIATED NUTS (INCLUDING CROSS-THREADED SITUATIONS).

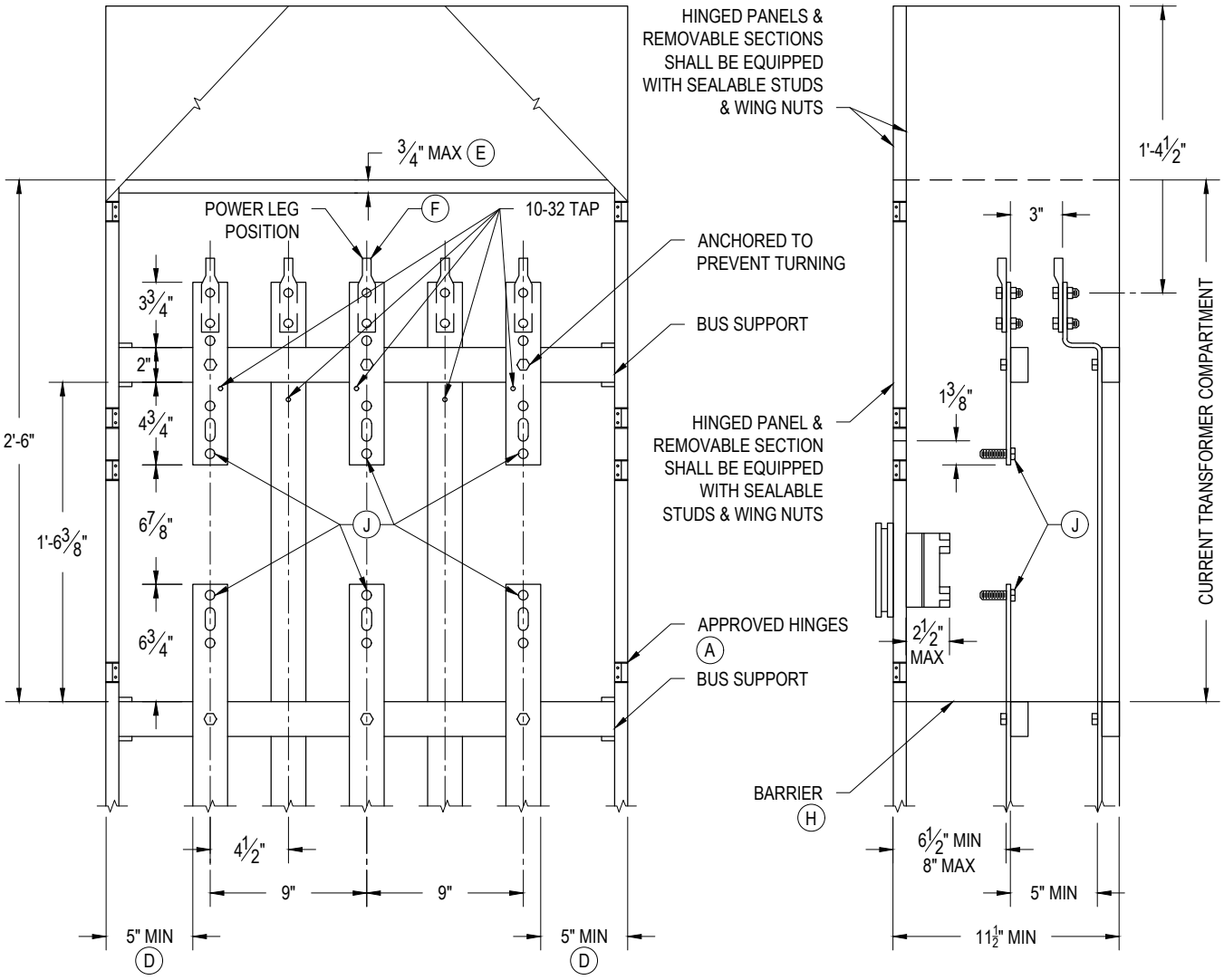
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-13

REV. DATE: APRIL 2025 REV. NO.: 5

CURRENT TRANSFORMER COMPARTMENT, 201-400 AMPERES (SINGLE PHASE, 3 WIRE SERVICES)

STANDARD NO.: ---



NOTES:

(A.) THE STATIONARY PORTION OF THE HINGES SHALL BE ATTACHED TO BOTH SIDES OF THE SWITCHBOARD IN ORDER TO PERMIT READY INTERCHANGEABILITY OF HINGED PANELS TO THE RIGHT OR LEFT SIDE.

B. THE COMPARTMENT SHALL BE ON THE SUPPLY SIDE OF THE MAIN SWITCH OR BREAKER.

C. THE DIRECTION OF FEED SHALL BE VERTICAL, & NO OTHER CONDUCTORS SHALL PASS THROUGH THIS COMPARTMENT.

(D.) THE CLEARANCE TO THE SIDE OF EACH COMPARTMENT SHALL BE INCREASED BY THE AMOUNT BY WHICH THE CORNER ANGLE EXCEEDS 1".

(E.) RETURN FLANGES FOR THE LOWER & UPPER METAL PANEL SUPPORT SHALL NOT PROJECT MORE THAN $\frac{3}{4}$" UP OR DOWN FROM THE ADJACENT SWITCHBOARD PANELS.

(F.) EACH BUS SHALL HAVE A CONNECTOR THAT WILL ACCEPT STRANDED CONDUCTORS HAVING THE AMPERE CAPACITY OF THE MAIN SWITCH OR BREAKER.

G. A REMOVABLE LINK SHALL BE INSTALLED IN THE POWER LEG WHEN THE SWITCHBOARD IS TO BE USED FOR FOR THREE PHASE DELTA SERVICE.

(H.) THE BARRIER SHALL BE OF INSULATING, NON-TRACKING MATERIAL & HAVE A MINIMUM OF 24 VENT HOLES OF $\frac{3}{4}$" DIAMETER.

I. THE BUS DIMENSIONS SHALL BE A MAXIMUM OF $\frac{3}{4}$" X 2" & A MINIMUM OF $\frac{1}{4}$" X 2" WHEN A LAMINATED BUS IS USED, THERE SHALL BE NO SPACE BETWEEN LAMINATIONS IN THE CURRENT TRANSFORMER COMPARTMENT.

(J.) BUS UNITS SHALL BE PROVIDED WITH A FIXED STUD FOR MOUNTING THE CURRENT TRANSFORMERS. EACH SHALL:

a. CONSIST OF $\frac{1}{2}$" STEEL BOLT & SHALL BE PROVIDED WITH A SPRING WASHER & A NUT. THE SPRING WASHER MAY BE EITHER A CONE TYPE (BELLVILLE) WASHER OR A SPLIT-RING WASHER & FLAT WASHER. ALL PARTS SHALL BE PLATED TO PREVENT CORROSION.

b. BE SECURED IN PLACE. "SECURED IN PLACE" SHALL MEAN THAT THE STUD WILL NOT TURN, BACK OUT OR LOOSEN IN ANY MANNER WHEN TIGHTENING OR LOOSENING THE ASSOCIATED NUTS (INCLUDING CROSS-THREADED SITUATIONS).

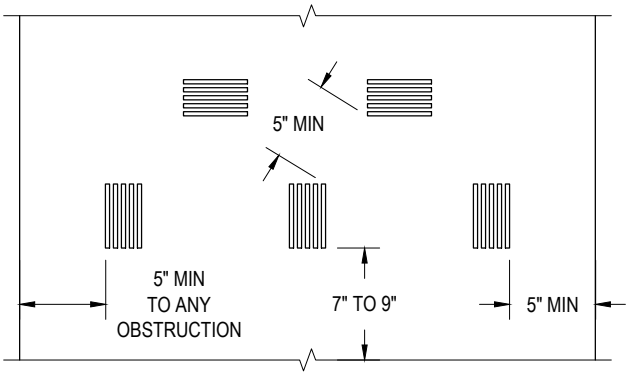
SMUD
Sacramento Municipal Utility District

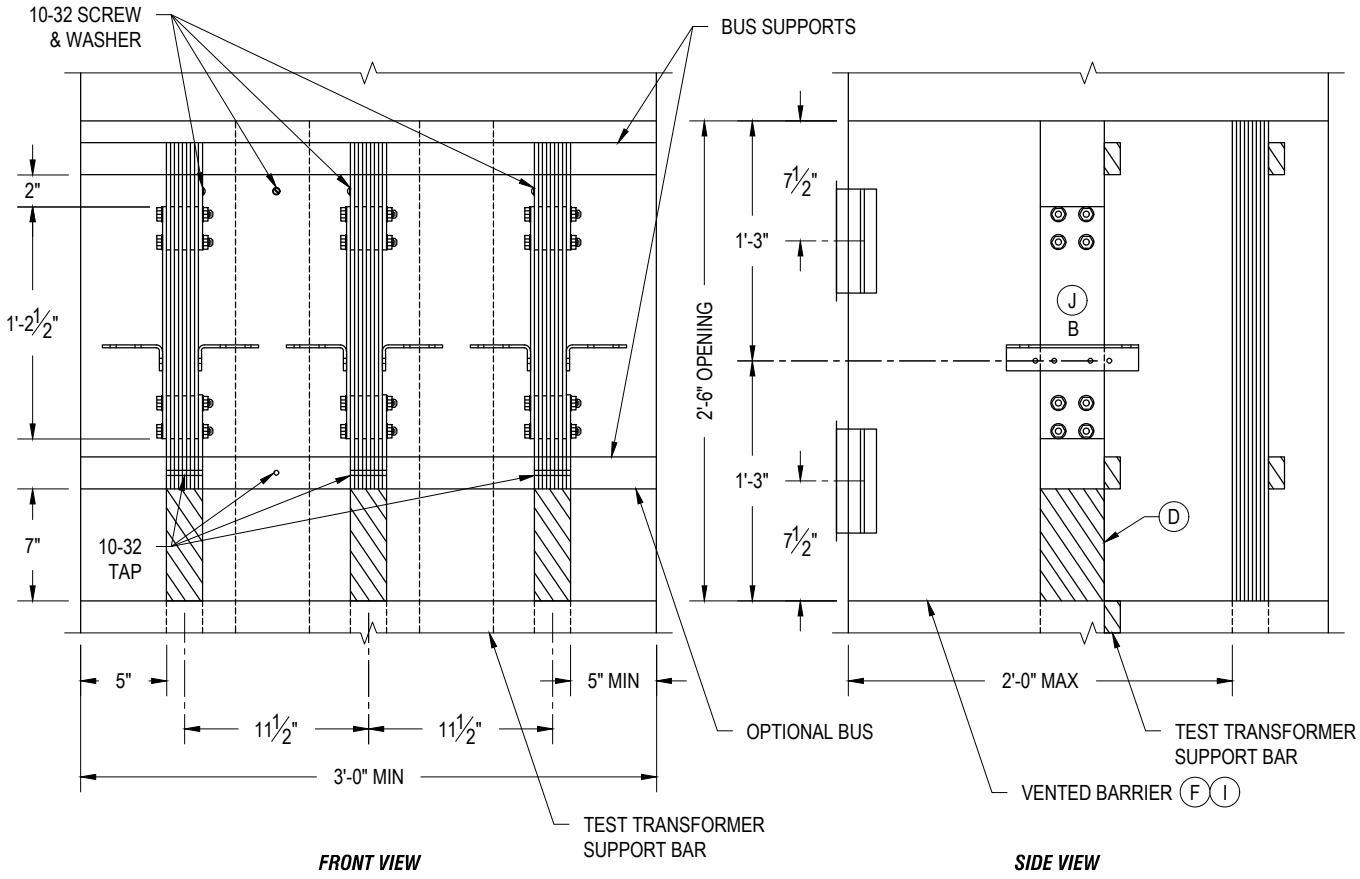
ESR: T004 ESR PG. NO.: A-14

REV. DATE: APRIL 2025 REV. NO.: 5

CURRENT TRANSFORMER COMPARTMENT, 201-1000 AMPERES (THREE PHASE, 4 WIRE SERVICES)

STANDARD NO.: ---





NOTES:

A. THE BUS ANCHORAGE SHALL BE SUCH THAT THE BUSSES WILL REMAIN IN POSITION WHEN REMOVABLE SECTION "B" IS OUT.
B. THE DIRECTION OF FEED SHALL BE VERTICAL, NO OTHER CONDUCTORS SHALL PASS THROUGH THIS COMPARTMENT.
C. THE TRANSFORMER COMPARTMENT SHALL BE ON THE SUPPLY SIDE OF THE MAIN SWITCH OR BREAKER.
(D.) BUS CORNERS SHOULD BE ROUNDED, AS NECESSARY. TO PREVENT DAMAGE TO INSULATION & TO MAINTAIN AN OVERALL DIAGONAL DIMENSION OF NOT MORE THAN 4.45". BUS INSULATION MUST BE ADEQUATE FOR THE VOLTAGE INVOLVED.
E. THE MAXIMUM PERMISSIBLE BUS UNIT SHALL CONSIST OF FOUR $\frac{1}{4}$" X 4" BARS SPACED $\frac{1}{4}$".
(F.) THE BARRIER SHOULD NOT BE LESS THAN 3'-9" & SHALL NOT BE MORE THAN 4'-2" ABOVE THE STANDING SURFACE.
G. CLEARANCE TO THE SIDE OF THE COMPARTMENT SHALL BE INCREASED BY THE AMOUNT BY WHICH THE CORNER ANGLE EXCEEDS 1".
H. RETURN FLANGES FOR THE LOWER & UPPER METER PANEL SUPPORT SHALL NOT PROJECT MORE THAN $\frac{3}{4}$" UP OR DOWN FROM THE ADJACENT SWITCHBOARD PANELS.
(I.) THE BARRIER SHALL BE OF INSULATING, NON-TRACKING MATERIAL & HAVE A MINIMUM OF 24 VENT HOLES OF $\frac{3}{8}$" DIAMETER.
(J.) FOR DETAILS OF REMOVABLE SECTION "B" & C.T. SUPPORT, SEE PAGE A-16.

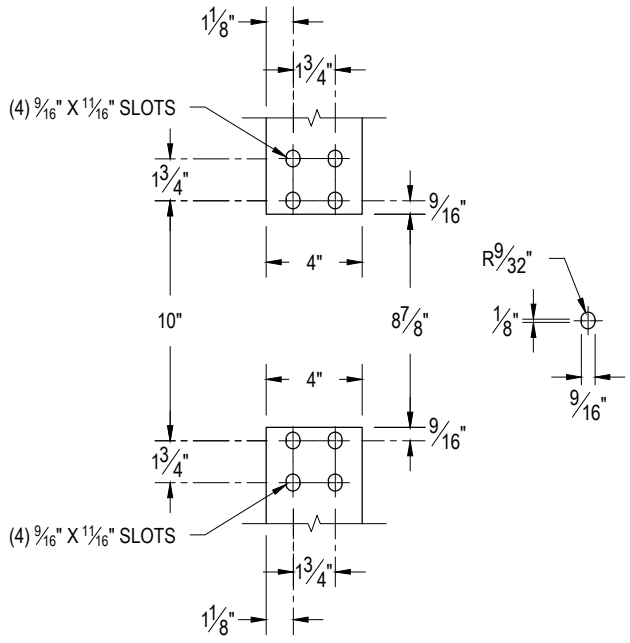
SMUD
Sacramento Municipal
Utility District

ESR: T004 ESR PG. NO.: A-15

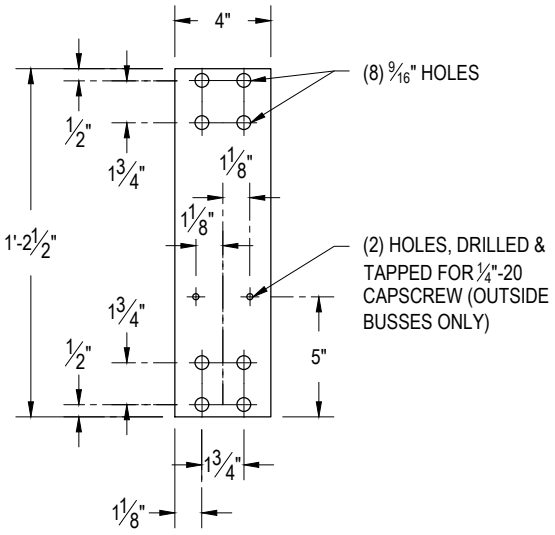
REV. DATE: APRIL 2025 REV. NO.: 5

CURRENT TRANSFORMER COMPARTMENT, 0-600 VOLTS, 1001-3000 AMPERES

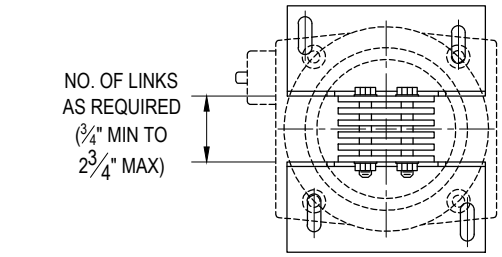
STANDARD NO.: ---

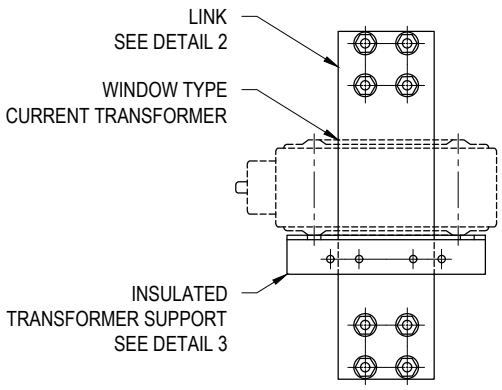


DETAIL - 1
DRILLING & SPACING BUS

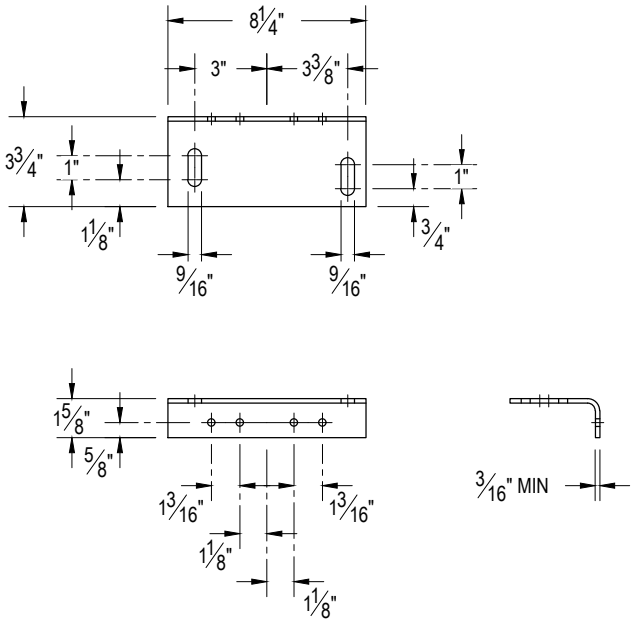


DETAIL - 2
1/4" X 4" LINK
(SAME MATERIAL AS BUS)





REMOVABLE LINK ASSEMBLY
(FURNISHED BY MANUFACTURER)



DETAIL - 3
INSULATED SUPPORT FOR CURRENT TRANSFORMER
(MATERIAL: INSULATING, NON-TRACKING)

NOTES:

A. THE MANUFACTURER WILL PROVIDE 1/2" HEX HEAD BOLTS, NUTS & LOCK WASHERS.

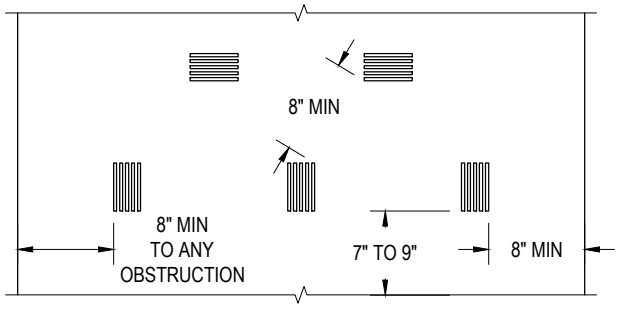
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-16

REV. DATE: APRIL 2025 REV. NO.: 5

CURRENT TRANSFORMER COMPARTMENT, 0-600 VOLTS, 1001-3000 AMPERES (REMOVABLE LINK & CURRENT TRANSFORMER SUPPORT)

STANDARD NO.: ---



TOP VIEW

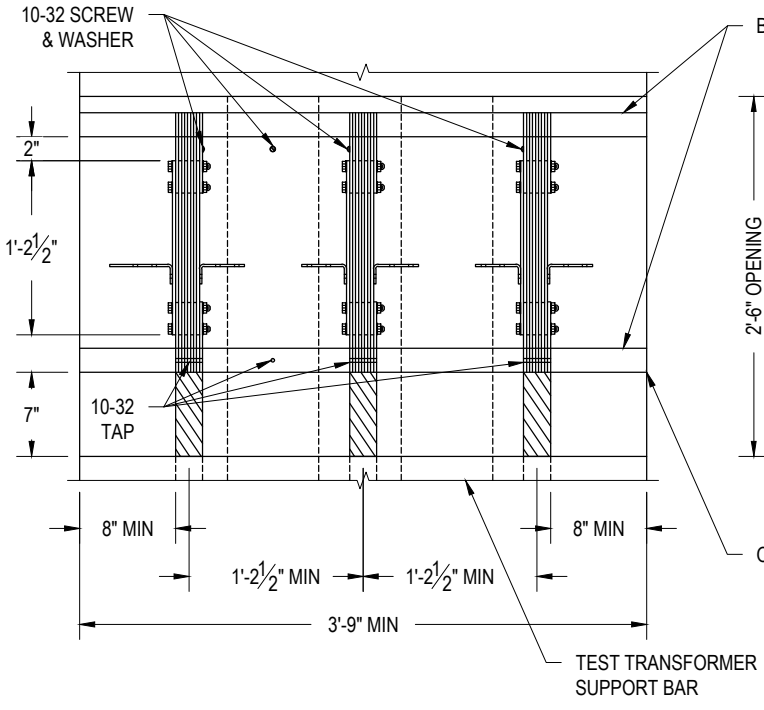
MAXIMUM NUMBER OF BARS:

4 - $\frac{1}{4}$" X 4" SPACED $\frac{1}{4}$"

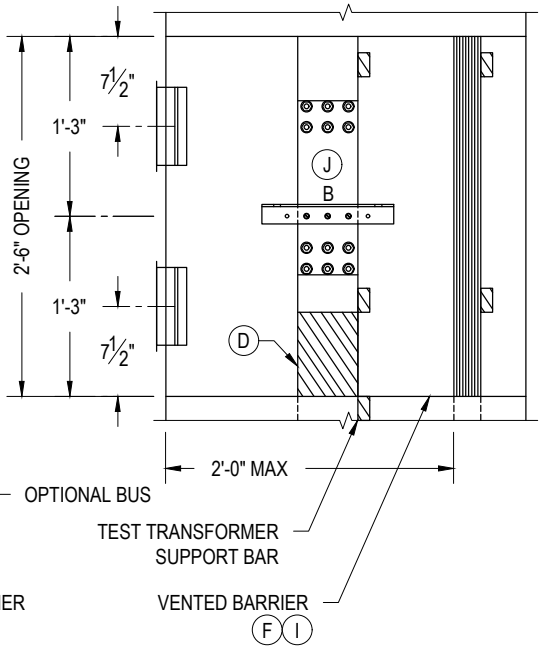
6 - $\frac{1}{4}$" X 5" SPACED $\frac{1}{4}$"

4 - $\frac{3}{8}$" X 5" SPACED $\frac{3}{8}$"

5 - $\frac{3}{8}$" X 5" SPACED $\frac{1}{4}$"



FRONT VIEW



SIDE VIEW

NOTES:

A. THE BUS ANCHORAGE SHALL BE SUCH THAT THE BUSSES WILL REMAIN IN POSITION WHEN REMOVABLE SECTION "B" IS OUT.

B. THE DIRECTION OF FEED SHALL BE VERTICAL. NO OTHER CONDUCTORS SHALL PASS THROUGH THIS COMPARTMENT.

C. THE TRANSFORMER COMPARTMENT SHALL BE ON THE SUPPLY SIDE OF THE MAIN SWITCH OR BREAKER.

(D.) BUS CORNERS SHOULD BE ROUNDED, AS NECESSARY, TO PREVENT DAMAGE TO INSULATION. BUS INSULATION MUST BE ADEQUATE FOR THE VOLTAGE INVOLVED.

E. THE MAXIMUM PERMISSIBLE BUS UNIT SHALL CONSIST OF SIX $\frac{1}{4}$" X 5" BARS SPACE $\frac{1}{4}$".

(F.) THE BARRIER SHOULD NOT BE LESS THAN 3-9" & SHALL NOT BE MORE THAN 4'-2" ABOVE THE STANDING SURFACE.

G. CLEARANCE TO THE SIDE OF THE COMPARTMENT SHALL BE INCREASED BY THE AMOUNT BY WHICH THE CORNER ANGLE EXCEEDS 1".

H. RETURN FLANGES FOR THE LOWER & UPPER METER PANEL SUPPORT SHALL NOT PROJECT MORE THAN $\frac{3}{4}$" UP OR DOWN FROM THE ADJACENT SWITCHBOARD PANELS.

(I.) THE BARRIER SHALL BE OF INSULATING MATERIAL & HAVE A MINIMUM OF 24 VENT HOLES OF $\frac{3}{8}$" DIAMETER.

(J.) FOR DETAILS OF REMOVABLE SECTION "B" & C.T. SUPPORT FOR A 4" BUS, SEE PAGE A-16 & FOR A 5" BUS, SEE PAGE A-18. CONSULT SMUD FOR USE OF A BUS LARGER THAN 5".

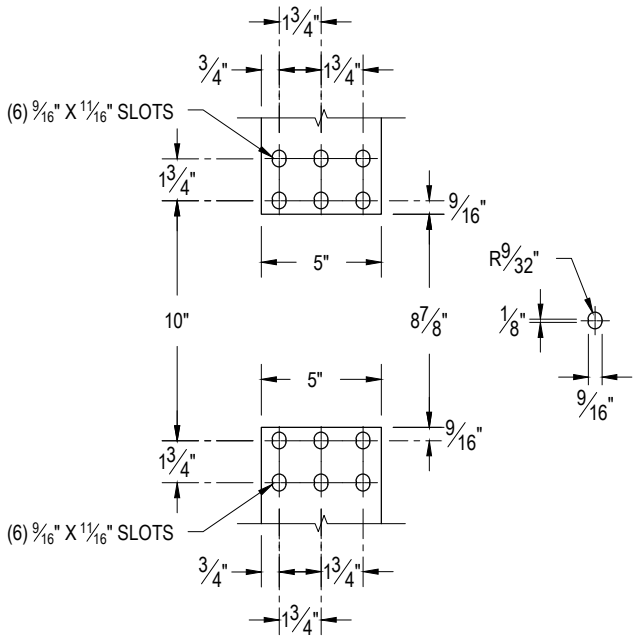
SMUD
Sacramento Municipal
Utility District

ESR: T004 ESR PG. NO.: A-17

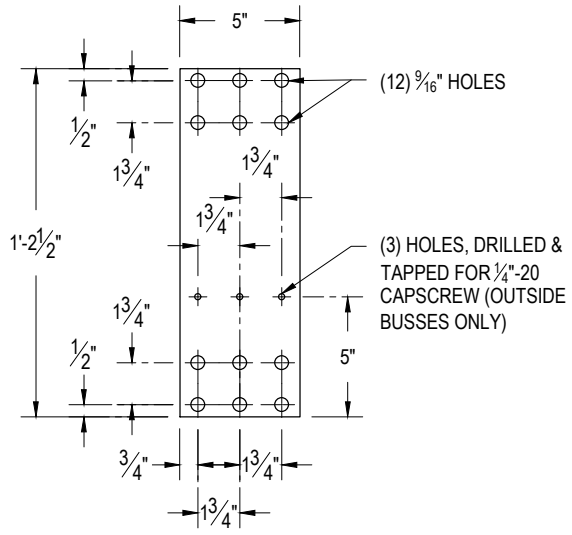
REV. DATE: APRIL 2025 REV. NO.: 5

CURRENT TRANSFORMER COMPARTMENT, 0-600 VOLTS, 3001-4000 AMPERES

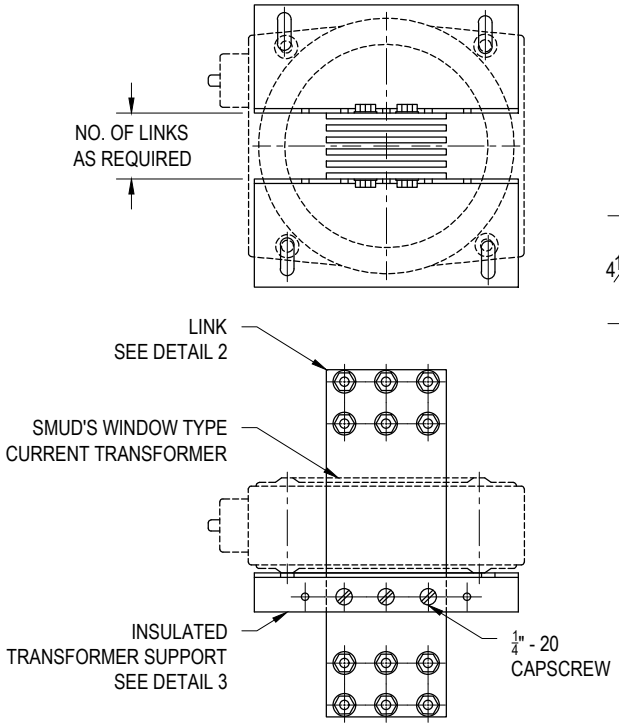
STANDARD NO.: ---



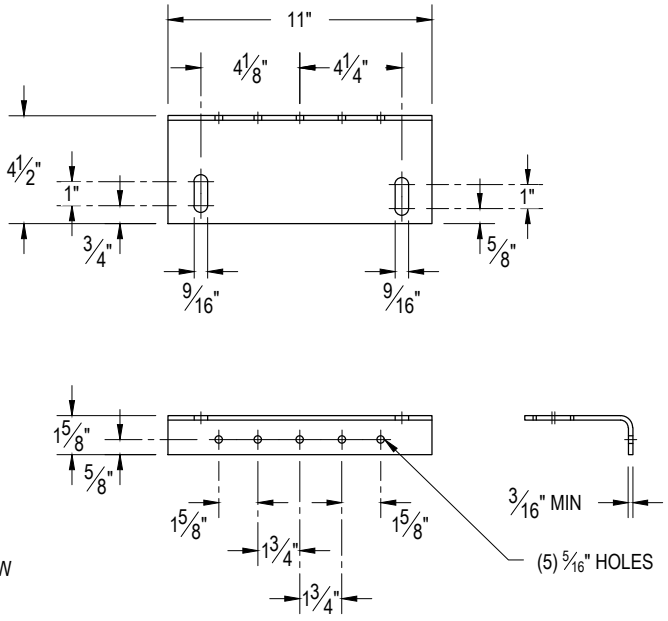
DETAIL - 1
DRILLING & SPACING BUS



DETAIL - 2
¼" X 6" LINK
(SAME MATERIAL AS BUS)



REMOVABLE LINK ASSEMBLY
(FURNISHED BY MANUFACTURER)



DETAIL - 3
INSULATED SUPPORT FOR CURRENT TRANSFORMER
(MATERIAL: INSULATING, NON-TRACKING)

NOTES:

A. THE MANUFACTURER WILL PROVIDE ½" HEX HEAD BOLTS, NUTS & LOCK WASHERS.
B. CONSULT SMUD FOR USE OF BARS LARGER THAN 5".

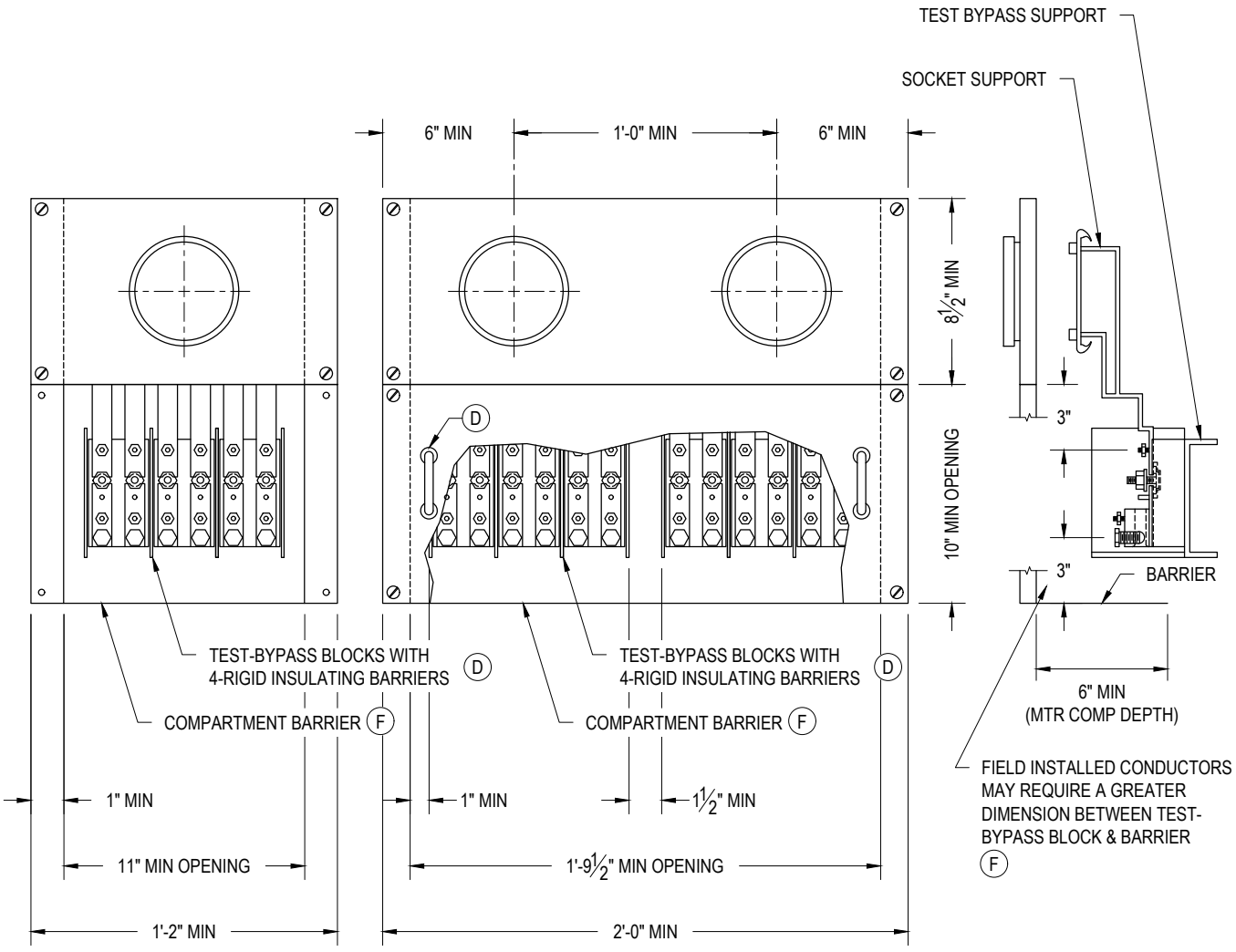
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-18

REV. DATE: APRIL 2025 REV. NO.: 5

CURRENT TRANSFORMER COMPARTMENT, 0-600 VOLTS, 3001-4000 AMPERES (REMOVABLE LINK & CURRENT TRANSFORMER SUPPORT)

STANDARD NO.:



NOTES:

A. TEST BYPASS BLOCKS & BARRIERS SHALL BE FURNISHED, INSTALLED & WIRED OR BUSSED TO THE METER SOCKET BY THE MANUFACTURER. BLOCKS & BARRIERS SHALL CONFORM TO THE REQUIREMENTS SHOWN ON PAGE A-19 & A-20. CONNECTION SEQUENCE IS LINE-LOAD, FROM LEFT TO RIGHT, FOR EACH PHASE.
B. METERED CONDUCTORS SHALL NOT PASS THROUGH ADJACENT METERING COMPARTMENTS EXCEPT IN ENCLOSED WIREWAYS.
C. METER PANELS SHALL BE REMOVABLE WITH A MAXIMUM OF TWO METERS PER PANEL.
(D.) TEST BYPASS BLOCK COVER PANELS SHALL BE SEALABLE & FITTED WITH HANDLES.
E. WHEN A NEUTRAL IS REQUIRED FOR METERING OR TESTING, AN INSULATED NEUTRAL TERMINAL SHALL BE PROVIDED BEHIND EACH TEST BYPASS COVER PANEL. THE TERMINAL SHALL BE READILY ACCESSIBLE WHEN THE COVER PANEL IS REMOVED & SHALL BE INDIVIDUALLY CONNECTED TO THE NEUTRAL BUS WITH A MINIMUM SIZE NO. 8 AWG COPPER WIRE.
(F.) A FACTORY INSTALLED, FULL-WIDTH INSULATING BARRIER SHALL BE LOCATED AT THE BOTTOM OF EACH TEST BYPASS COMPARTMENT. PER EUSERC STANDARD.
G. FOR 3/Ø, 4 WIRE, CONNECT THE 7TH JAW TO THE BODY OF THE NEUTRAL LUG WITH NO. 8 COPPER WIRE.
H. FOR 3/Ø, 4 WIRE DELTA, IDENTIFY THE RIGHT-HAND TEST BYPASS BLOCK (2 POLES) AS THE POWER LEG.
I. FOR 1/Ø, 3 WIRE, OMIT THE CENTER TEST BYPASS BLOCK.
J. FOR 1/Ø, 3 WIRE, 120/208 VOLT, OMIT THE CENTER TEST BYPASS BLOCK & CONNECT THE 5TH JAW TO THE BODY OF THE NEUTRAL LUG WITH NO. 8 COPPER WIRE.
K. METER PANELS SHALL BE REMOVABLE WHEN THE METER IS IN PLACE. THE METER SOCKET IS TO BE SUPPORTED INDEPENDENT OF & ATTACHED TO THE METER PANEL.
L. SEPARATE LINE & LOAD CONDUCTORS SHALL BE INSTALLED BY THE CONTRACTOR OR MANUFACTURER FOR EACH METER SOCKET.
M. EACH LINE & LOAD POSITION SHALL BE CLEARLY IDENTIFIED BY ¾" MINIMUM BLOCK LETTER LABELING.
N. ALL SECURING SCREWS SHALL BE CAPTIVE ALL PANELS SHALL BE SEALABLE.
O. SEE PAGE 26 FOR OUTDOOR COMMERCIAL METER CLEARANCE.

SMUD
Sacramento Municipal Utility District

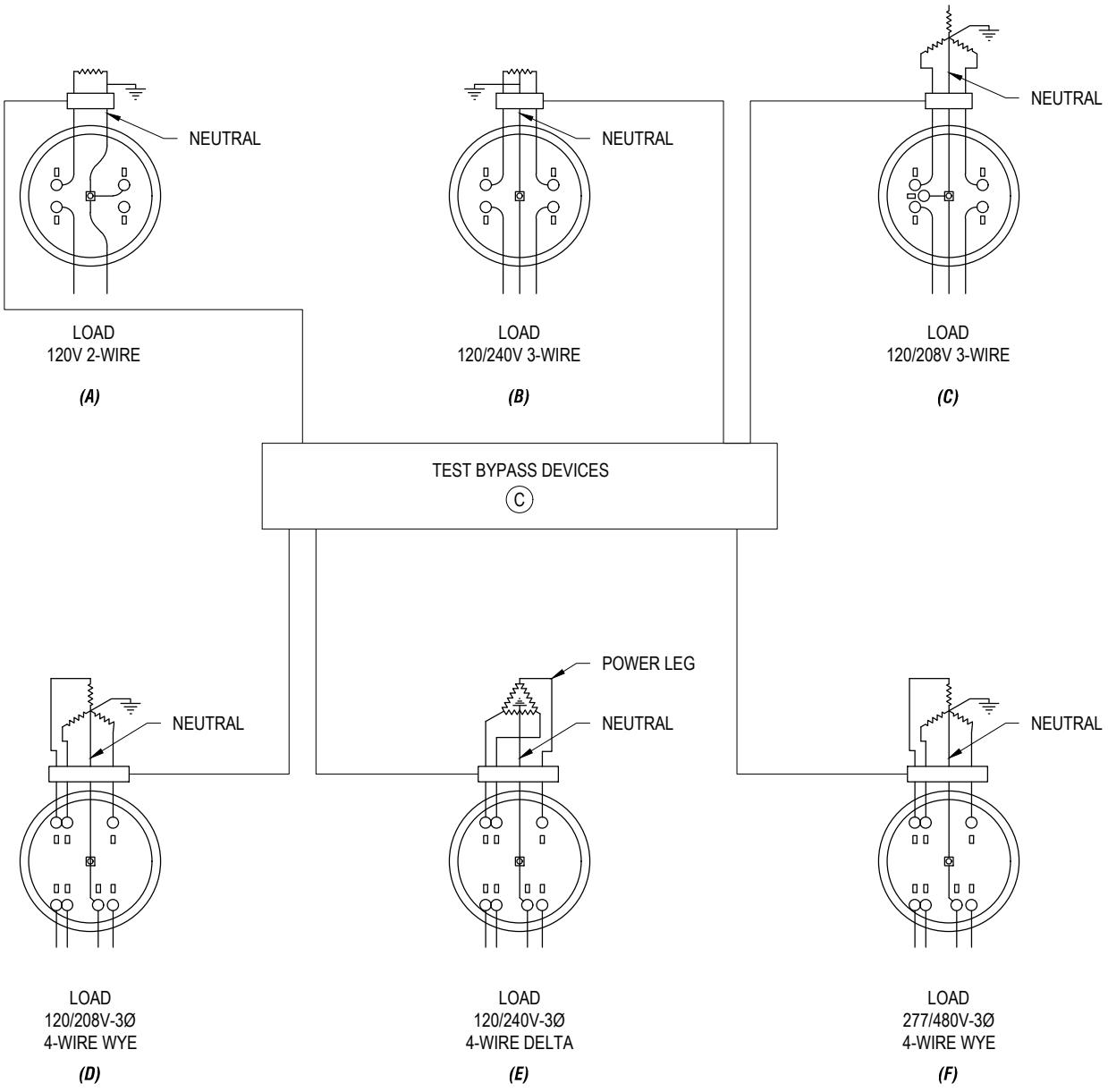
ESR: T004 ESR PG. NO.: A-19

REV. DATE: APRIL 2025 REV. NO.: 5

SWITCHBOARD SERVICE SECTION WITH SELF-CONTAINED METER PANELS

STANDARD NO.: ---

SINGLE PHASE SOCKETS



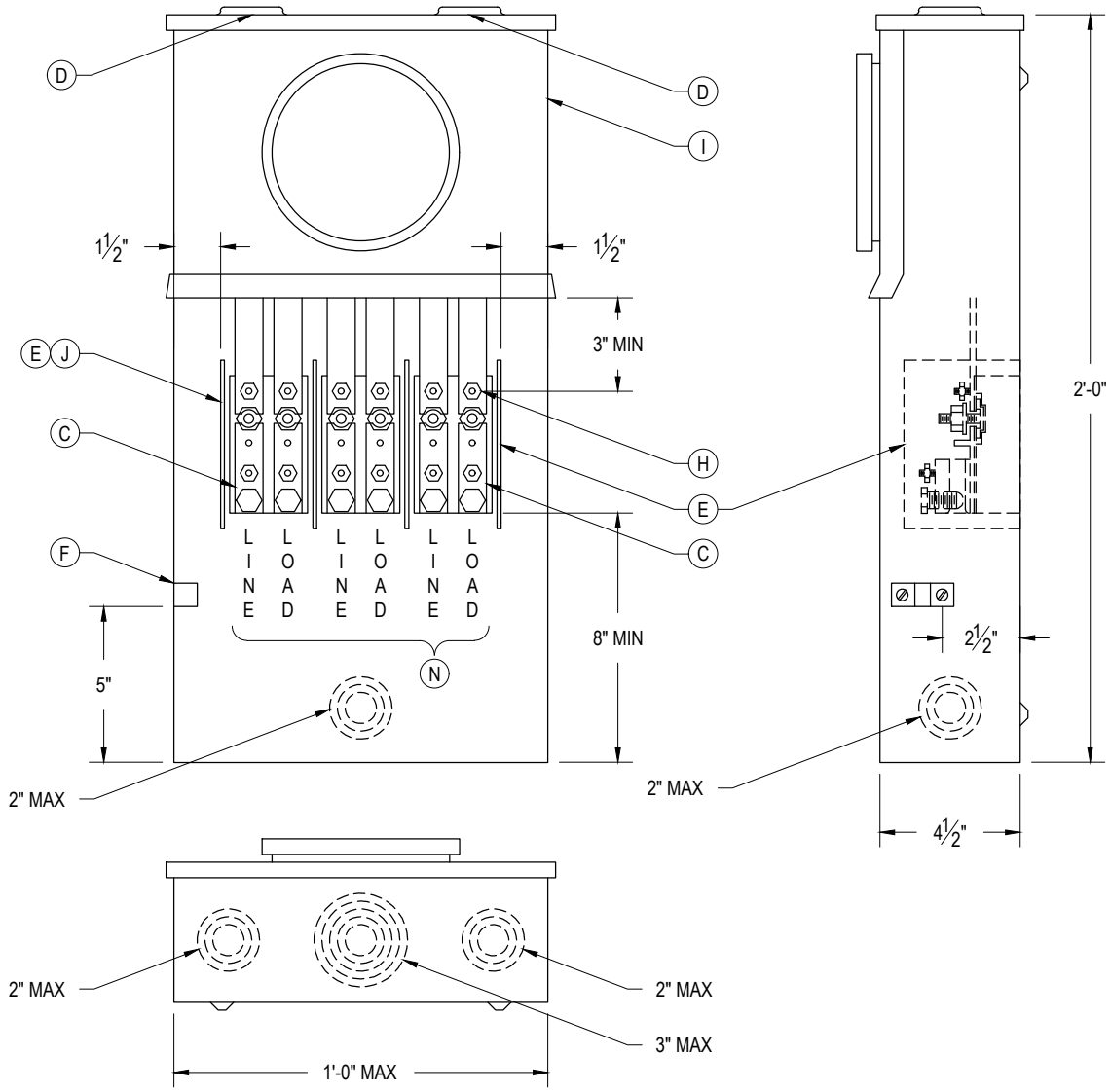
POLYPHASE SOCKETS

NOTES:

A. COMMERCIAL, SELF-CONTAINED METER SOCKETS SHALL BE U/L APPROVED & SHALL HAVE A CONTINUOUS DUTY CURRENT RATING LOAD EQUAL TO OR GREATER THAN THE CURRENT RATING OF THE ASSOCIATED LOAD SERVICE EQUIPMENT.

B. NEUTRAL TAPS SHALL BE CONNECTED TO THE SERVICE NEUTRAL CONDUCTOR & LOCATED BEHIND SEALED PANELS. WIRE NUTS ARE NOT PERMITTED.

(C.) FOR TEST BYPASS DEVICES, SEE PAGES A-19 THROUGH A-23.



NOTES:

A. SELF-CONTAINED METER SOCKETS SHALL BE NATIONAL RECOGNIZED TESTING LAB OR U/L CURRENT RATED FOR CONTINUOUS DUTY.
B. THIS DEVICE MAY BE USED AS A COMBINATION TERMINATING PULL & METER SOCKET BOX FOR AN UNDERGROUND SERVICE.
C. ALUMINUM BODIED TERMINALS SHALL BE USED FOR #6 THROUGH #1/0 WIRE.
D. HUBS MUST BE CAPPED OFF IF USED FOR AN UNDERGROUND FEED.
E. RIGID INSULATING BARRIERS MUST BE USED.
F. INSULATED, BONDABLE VERTICAL LAY-IN, DOUBLE NEUTRAL LUG WITH NO.1/0 WIRE CAPACITY.
G. TEST BLOCKS SHALL BE BUSSED OR WIRED TO SOCKET JAWS OR TERMINALS.
H. UPPER TEST CONNECTOR STUDS.
I. ALL SECTION COVERS SHALL BE INDEPENDENTLY REMOVABLE. THE UPPER COVER SHALL BE NON-REMOVABLE WHEN THE METER IS IN PLACE. THE LOWER COVER SHALL BE SEALABLE & PERMANENTLY LABELED: "DO NOT BREAK SEALS, NO FUSES INSIDE."
J. FOR 3/Ø, 4 WIRE, CONNECT THE 7TH JAW TO THE BODY OF THE NEUTRAL LUG WITH #8 COPPER WIRE.
K. FOR 3/Ø, 4 WIRE DELTA, IDENTIFY THE RIGHT-HAND TEST BYPASS BLOCK (2 POLES) AS THE POWER LEG.
L. FOR 1/Ø, 3 WIRE, OMIT THE CENTER BLOCK & ASSOCIATED BARRIERS.
M. FOR 1/Ø, 3 WIRE, 120/208 VOLT, OMIT THE CENTER BLOCK & ASSOCIATED BARRIERS & CONNECT THE 5TH JAW TO THE BODY OF THE NEUTRAL LUG WITH #8 COPPER WIRE.
N. DECALS ON THE INSIDE BACK OF THE ENCLOSURE MUST BE IN ¾" MINIMUM HIGH BLOCK LETTERS.
O. TEST BLOCK DETAILS ARE ON PAGE A-23.

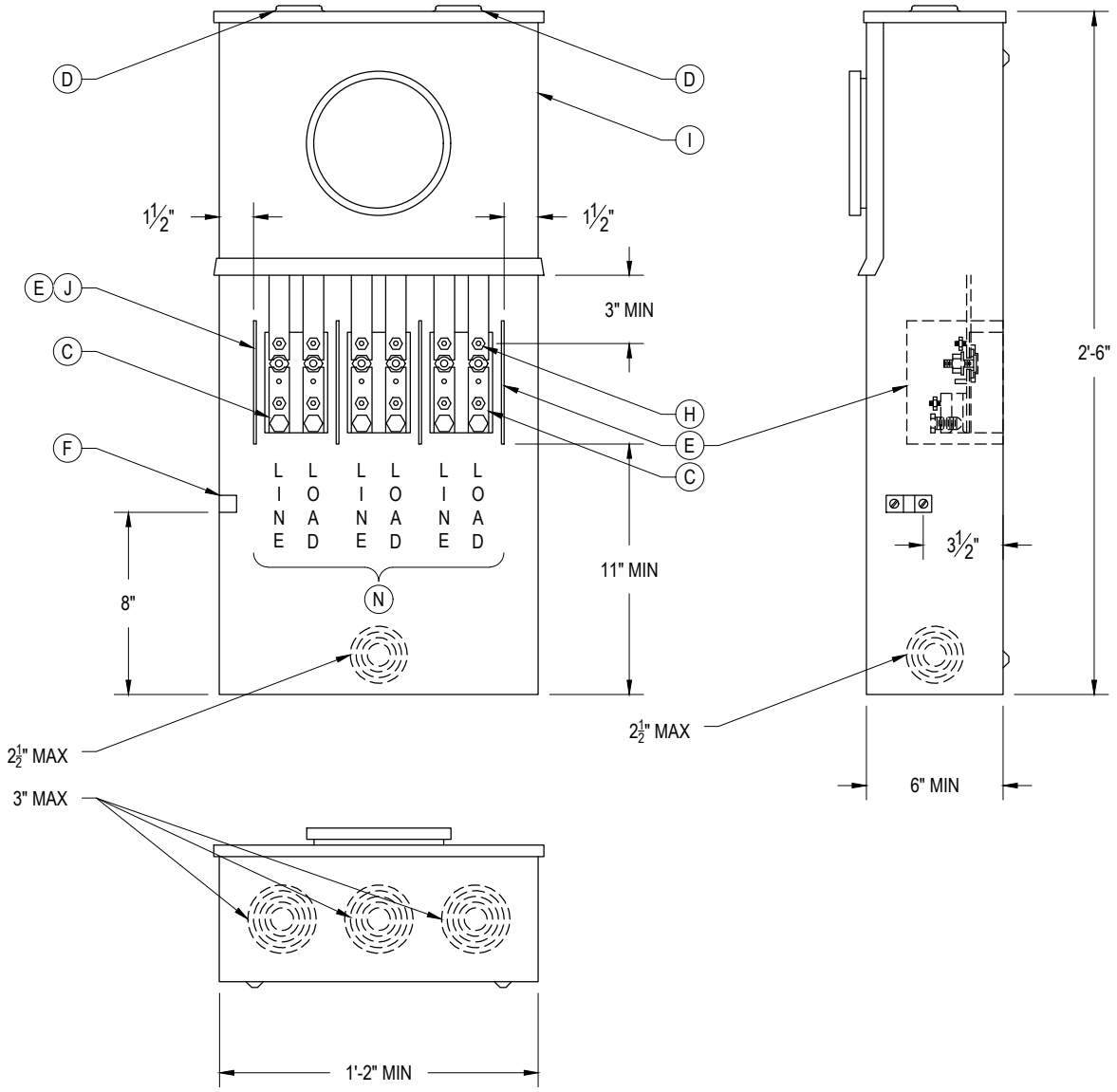
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-21

REV. DATE: APRIL 2025 REV. NO.: 5

SAFETY SOCKET BOX WITH FACTORY INSTALLED TEST BYPASS DEVICES, 100 AMPERES MAXIMUM

STANDARD NO.: ---



NOTES:

A. SELF-CONTAINED METER SOCKETS SHALL BE NATIONAL RECOGNIZED TESTING LAB OR U/L CURRENT RATED FOR CONTINUOUS DUTY.
B. THIS DEVICE MAY BE USED AS A COMBINATION TERMINATING PULL & METER SOCKET BOX FOR AN UNDERGROUND SERVICE.
C. ALUMINUM BODIED TERMINALS SHALL BE USED FOR #1/0 THROUGH #250 MCM WIRE.
D. HUBS MUST BE CAPPED OFF IF USED FOR UNDERGROUND FEED.
E. RIGID INSULATING BARRIERS MUST BE USED.
F. INSULATED, BONDABLE VERTICAL LAY-IN, DOUBLE NEUTRAL LUG WITH #250 MCM WIRE CAPACITY.
G. TEST BLOCKS SHALL BE BUSSED OR WIRED TO SOCKET JAWS OR TERMINALS.
H. UPPER TEST CONNECTOR STUDS.
I. ALL SECTION COVERS SHALL BE INDEPENDENTLY REMOVABLE. THE UPPER COVER SHALL BE NON-REMOVABLE WHEN THE METER IS IN PLACE. THE LOWER COVER SHALL BE SEALABLE & PERMANENTLY LABELED: "DO NOT BREAK SEALS, NO FUSES INSIDE."
J. FOR 3/Ø, 4 WIRE, CONNECT THE 7TH JAW TO THE BODY OF THE NEUTRAL LUG WITH #8 COPPER WIRE.
K. FOR 3/Ø, 4 WIRE DELTA, IDENTIFY THE RIGHT HAND TEST BYPASS BLOCK (2 POLES) AS THE POWER LEG.
L. FOR 1/Ø, 3 WIRE, OMIT THE CENTER BLOCK & ASSOCIATED BARRIERS.
M. FOR 1/Ø, 3 WIRE, 120/208V, OMIT THE CENTER BLOCK & ASSOCIATED BARRIERS & CONNECT THE 5TH JAW TO THE BODY OF THE NEUTRAL LUG WITH #8 COPPER WIRE.
N. DECALS ON THE INSIDE BACK OF THE ENCLOSURE MUST BE IN ¾" MINIMUM HIGH BLOCK LETTERS.
O. TEST BLOCK DETAILS ARE ON PAGE A-23.

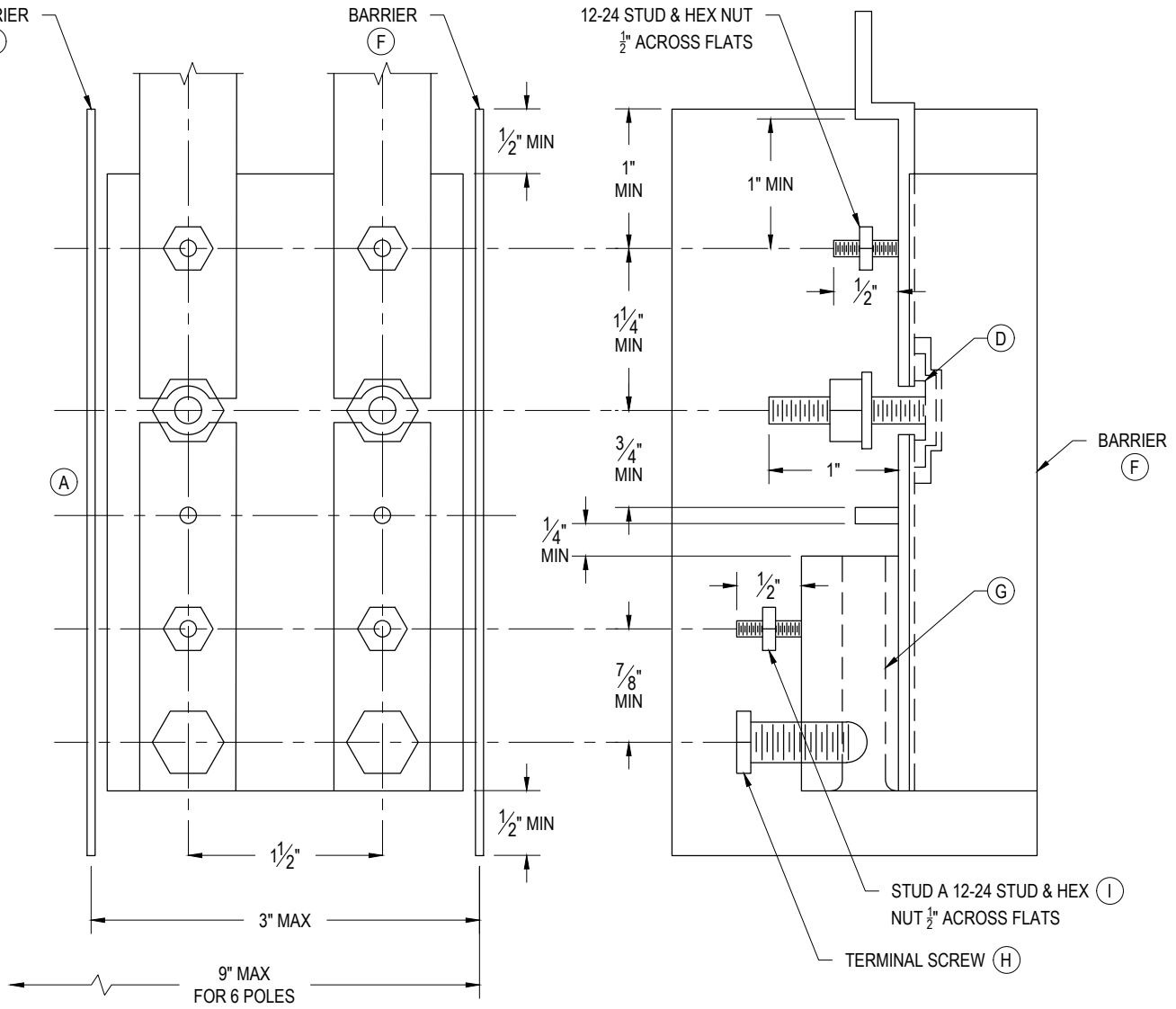
SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-22

REV. DATE: APRIL 2025 REV. NO.: 6

SAFETY SOCKET BOX WITH FACTORY INSTALLED TEST BYPASS DEVICES, 200 AMPERES MAXIMUM

STANDARD NO.: ---



NOTES:

(A.) THE STRIKE DISTANCE BETWEEN THE UPPER & LOWER BUS SECTIONS SHALL NOT BE LESS THAN $\frac{1}{4}$" WHEN THE SHORTING NUT IS BACKED OFF.

B. THE CIRCUIT-CLOSING NUT SHALL BE A HEX NUT $\frac{5}{8}$" ACROSS FLATS WITH PLATED COPPER WASHER ATTACHED & HAVE THREADS COUNTER-BORED AT THE BOTTOM TO FACILITATE REINSTALLATION. THE BOLT HEAD SHALL BE SECURED IN PLACE TO PREVENT TURNING & BACKOUT.

C. THE CIRCUIT-CLOSING NUT & BOLT ASSEMBLY SHALL MAINTAIN THE APPLIED CONTACT PRESSURE BETWEEN THE PLATED COPPER WASHER & THE BUS MEMBERS OF THE TEST BYPASS BLOCK.

(D.) THE INSULATING WASHER SHALL BE MADE FROM DIMENSIONALLY STABLE, NON-TRACKING MATERIAL & SHALL PROVIDE A MINIMUM OF $\frac{1}{8}$" CREEP DISTANCE BETWEEN THE BOLT & THE BUS SECTIONS. BUS SECTIONS SHALL BE PLATED.

E. WIRE STOPS SHALL EXTEND TO THE CENTER OF THE TERMINAL OPENING OR BEYOND.

(F.) RIGID INSULATING BARRIERS SHALL PROJECT AT LEAST $\frac{1}{4}$" BEYOND ANY ENERGIZED PARTS WHEN THE MAXIMUM WIRE SIZE IS INSTALLED.

(G.) TERMINALS SHALL BE ALUMINUM BODIED. THE OPENING SHALL EXTEND THROUGH THE TERMINAL BODY &, IF THE WIRE HOLE IS ROUND, SHALL BE CHAMFERED AS NECESSARY TO FACILITATE INSTALLATION OF THE LARGEST SIZE WIRE.

(H.) THE TERMINAL SCREW MAY BE OF THE ALLEN TYPE ($\frac{3}{16}$" ACROSS FLATS FOR 100 AMP OR $\frac{5}{16}$" ACROSS FLATS FOR 200 AMP). IF STUD "A" IS A PART OF THE TERMINAL SCREW, THE TERMINAL SCREW SHALL BE $\frac{5}{8}$" HEX ACROSS FLATS.

(I.) STUD "A" SHALL BE LOCATED IN THE CLEAR AREA BETWEEN THE TERMINATING LUG & THE CIRCUIT- CLOSING NUT & MAY BE POSITIONED ON THE TERMINAL BODY, ON THE TERMINAL SCREW, ON THE BUS MEMBER, OR INCORPORATED AS PART OF THE WIRE STOP.

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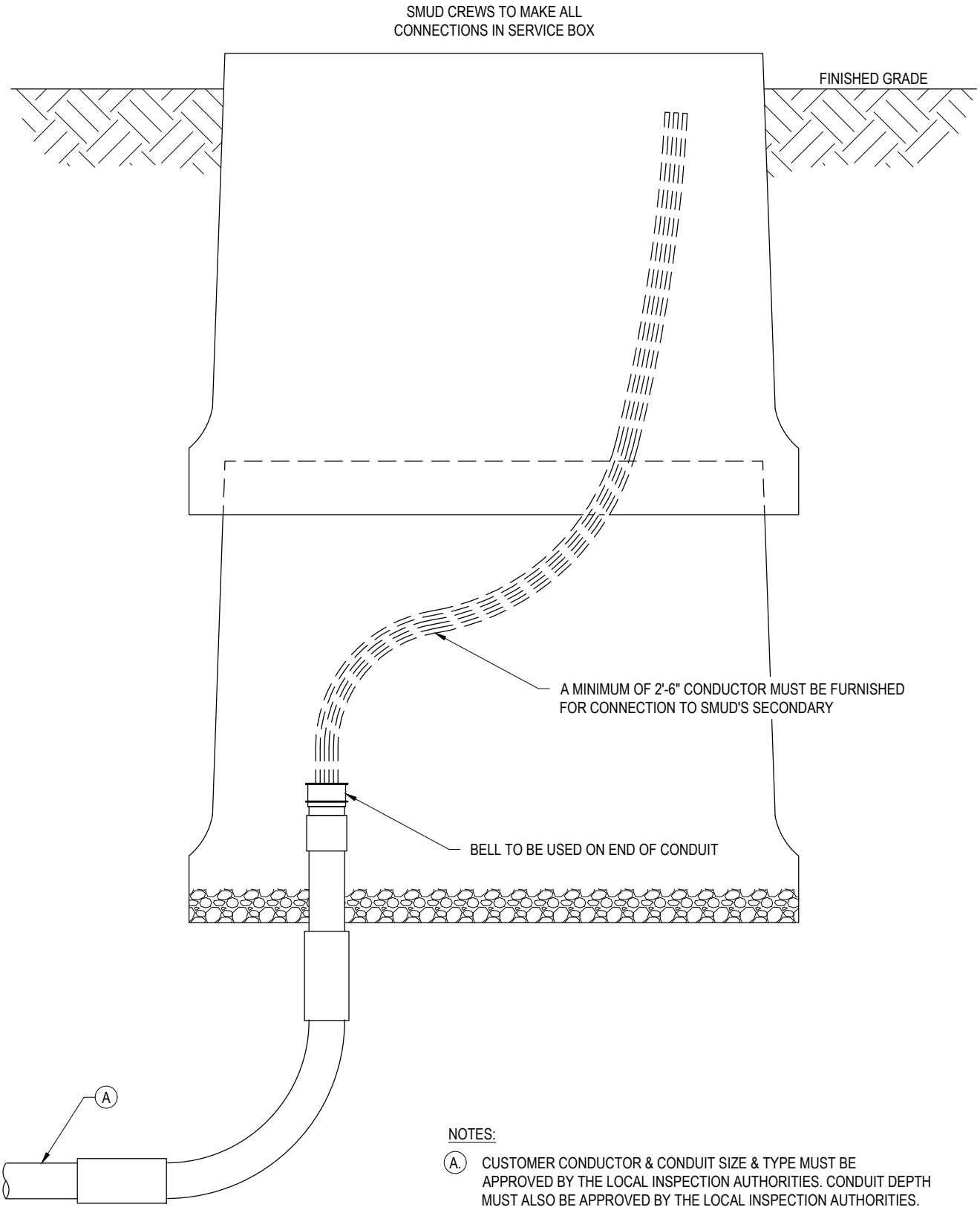
ESR: T004 ESR PG. NO.: A-23

REV. DATE: APRIL 2025 REV. NO.: 5

TEST BYPASS BLOCKS FOR SAFETY SOCKET, 0-200 AMPERES

STANDARD NO.: ---



NOTES:

(A.) CUSTOMER CONDUCTOR & CONDUIT SIZE & TYPE MUST BE APPROVED BY THE LOCAL INSPECTION AUTHORITIES. CONDUIT DEPTH MUST ALSO BE APPROVED BY THE LOCAL INSPECTION AUTHORITIES.

SMUD
Sacramento Municipal Utility District

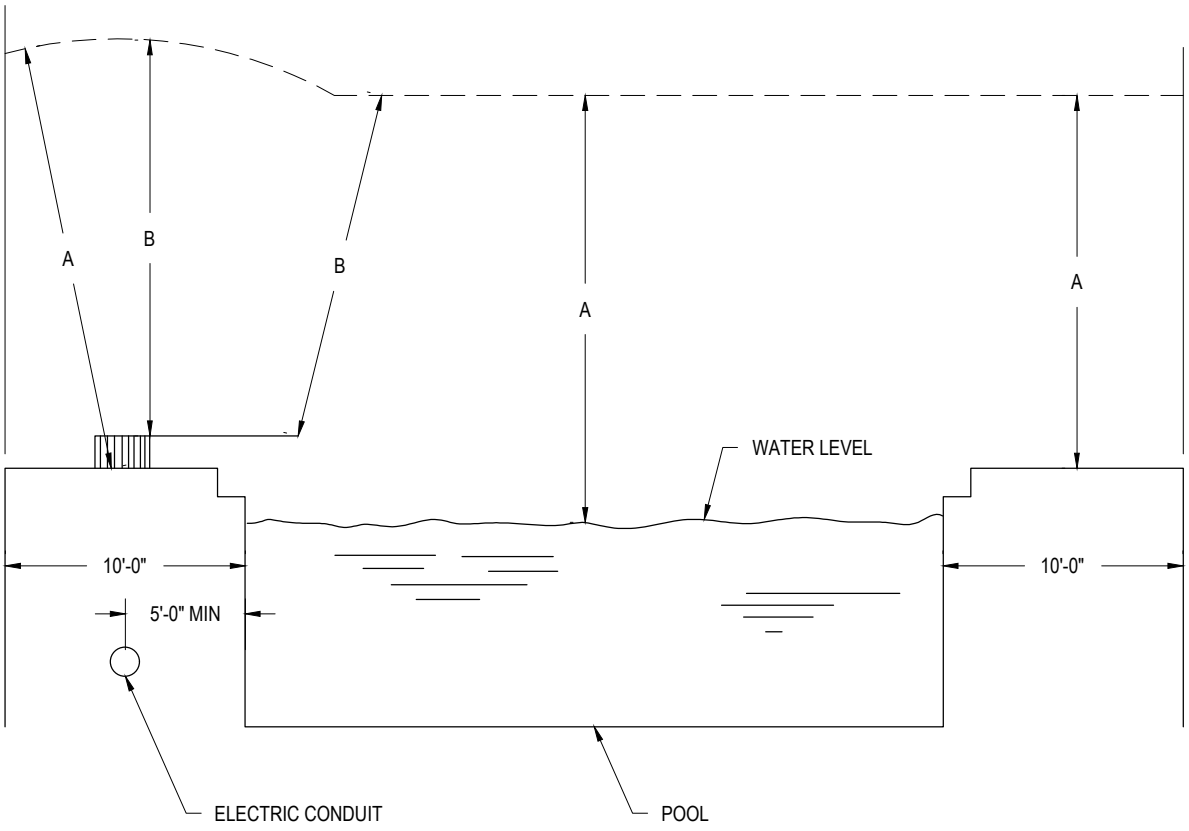
ESR: T004 ESR PG. NO.: A-24

REV. DATE: APRIL 2025 REV. NO.: 5

MINIMUM REQUIREMENTS FOR CUSTOMER'S UNDERGROUND SERVICE CONNECTION FROM SMUD SERVICE BOX

STANDARD NO.:

SERVICE CLEARANCES OVER SWIMMING POOL



CLEARANCES

	INSULATED SUPPLY OR SERVICE DROP CABLES, 0-750 VOLTS TO GROUND, SUPPORTED ON & CABLED TOGETHER WITH AN EFFECTIVELY GROUNDED BARE MESSENGER	ALL OTHER SUPPLY OR OTHER SERVICE *DROP CONDUCTORS*	
		VOLTAGE TO GROUND	
		0-15 KV	15-50 KV
A. CLEARANCE IN ANY DIRECTION TO THE WATER LEVEL, EDGE OF WATER SURFACE, BASE OF DIVING PLATFORM OR PERMANENTLY-ANCHORED RAFT.	PUBLISH	25'-0"	27'-0"
B. CLEARANCE IN ANY DIRECTION TO THE OBSERVATION STAND, DIVING PLATFORM OR TOWER.	14'-6"	17'-0"	18'-0"

NOTES:

A. CLEARANCES PER LATEST NEC/GENERAL ORDER 95.

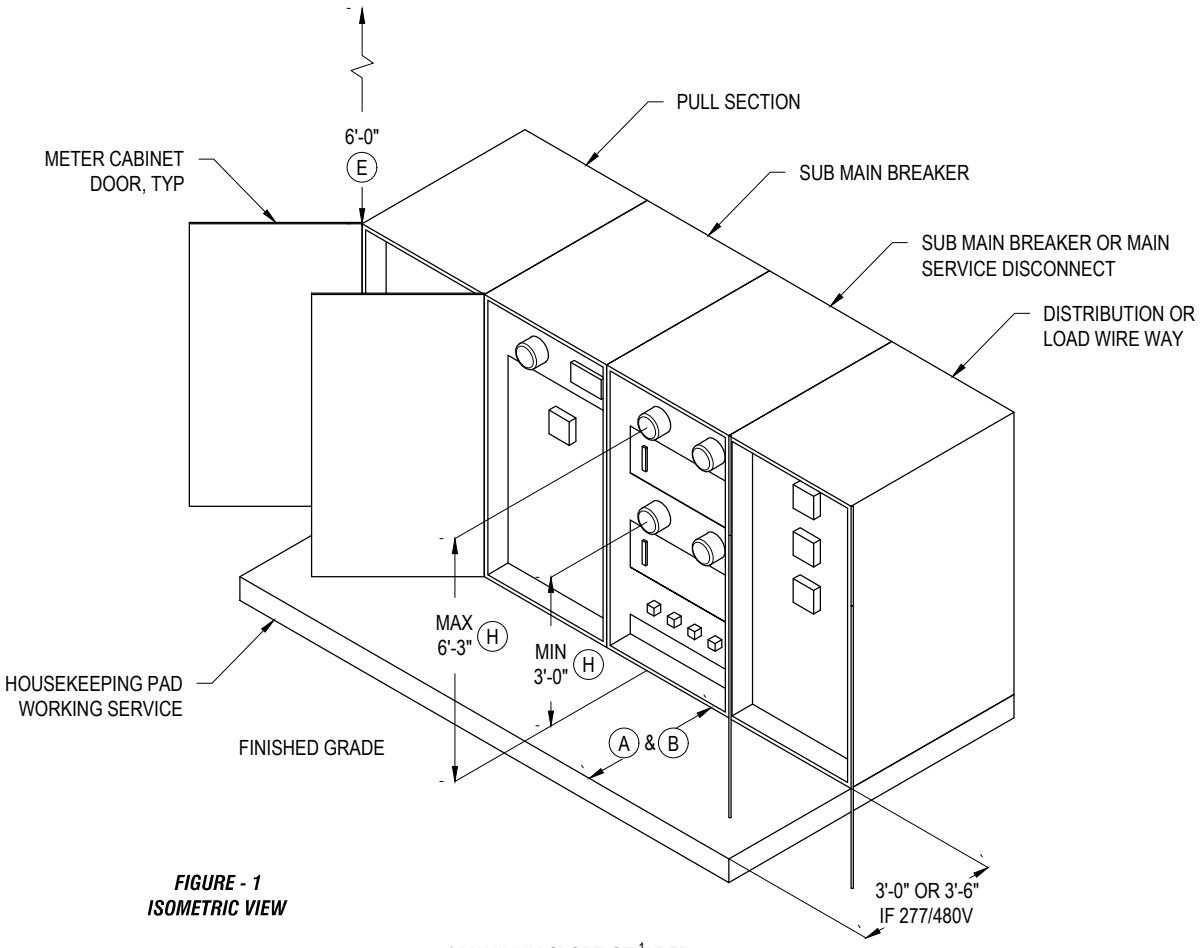


FIGURE - 1
ISOMETRIC VIEW

NOTES:

(A.) WITH THE CABINET DOOR OPEN, A CLEAR LEVEL WORKING SPACE OF AT LEAST 3'-0" IS REQUIRED DIRECTLY IN FRONT OF THE METER, MEASURED FROM THE FRONT OF NEMA 3R DOOR OR FRONT OF NEMA 1R PANEL.

(B.) THE 3'-0" MINIMUM WORKING CLEARANCE MUST BE INCREASED TO 3'-6" ON ALL 277/480Y INSTALLATIONS.

C. WORK SPACE SHALL BE CLEAR & EXTEND FROM THE GRADE, FLOOR, OR PLATFORM TO A HEIGHT OF 6'-6" OR THE HEIGHT OF THE ENCLOSURE, WHICHEVER IS GREATER, SHALL BE MAINTAINED.

D. WORK SPACE SHALL PERMIT A MIN 90° OPENING OF EQUIPMENT DOORS.

(E.) VERTICAL CLEARANCE ABOVE PANEL: THE SPACE EQUAL TO THE WIDTH & DEPTH OF THE EQUIPMENT, & EXTENDING FROM GRADE TO A HEIGHT OF 6'-0" ABOVE THE EQUIPMENT SHALL BE DEDICATED TO THE ELECTRICAL INSTALLATION.

F. IF PANEL IS INSTALLED INDOORS THE HOUSEKEEPING PAD SHALL BE FLUSH WITH FRONT OF SWITCHBOARD METER PANEL OR COMPLY WITH FIGURES 1 & 2.

G. RUNOFF SLOPE OF UP TO $\frac{1}{4}$" PER FOOT AWAY FROM SWITCHBOARD IS ACCEPTABLE.

(H.) MINIMUM & MAXIMUM METER HEIGHT SHALL BE TO STANDING GRADE. SEE SECTION 4.10 IN T004.

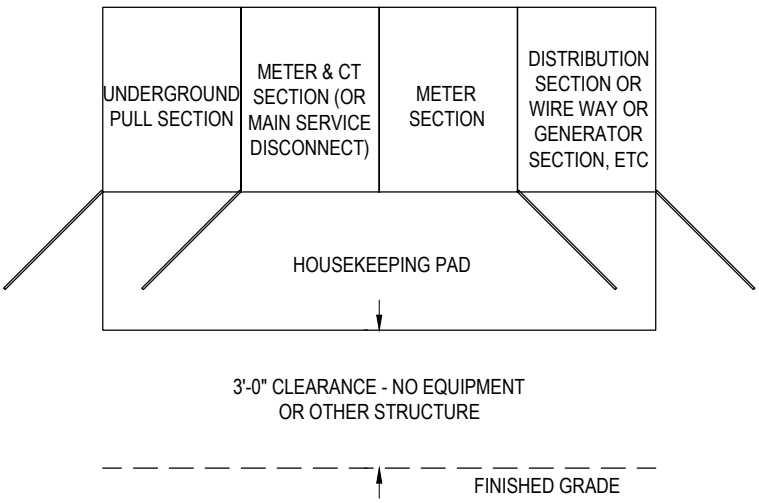


FIGURE - 2
TOP VIEW

SMUD
Sacramento Municipal Utility District

ESR: T004 ESR PG. NO.: A-26

REV. DATE: APRIL 2025 REV. NO.: 3

CLEARANCE FOR OUTDOOR COMMERCIAL METER ENCLOSURE

STANDARD NO.: ---

MINIMUM REQUIREMENT FOR CUSTOMER'S UNDERGROUND SERVICE

COMMERCIAL DELTA METER REQUIREMENTS

TYPE OF SERVICE	REF. PAGE NO.	MAIN SIZE AMPS.	METER	METER SOCKET	METERING & TRANSFORMERS	TEST BYPASS
2W-1 PHASE 120V	A-21	100	CL. 100 120V 2W 1 PHASE	100A 4 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
3W-1 PHASE 120/240V	A-21	0-100	CL. 200 240V 3W 1 PHASE	100A-200A 4 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
3W-1 PHASE 120/240V	A-22	101-200	CL. 200 240V 3W 1 PHASE	200A 4 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
3W-1 PHASE 120/240V	A-6, A-7, A-8, A-9, A-13	201-400	CL. 20 240V 3W 1 PHASE	COMB CAN / SWITCHBOARD 6 POINT	2-2W (C)	7 POLE TEST SWITCH (B)
4W-3 PHASE 120/240V	A-21	0-100	CL. 200 240V 4W DELTA 3 PHASE	100A 7 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 120/240V	A-22	101-200	CL. 200 240V 4W DELTA 3 PHASE	200A 7 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 120/240V	A-6, A-7, A-9, A-14	201-400	CL. 20 240V 4W 3 PHASE	COMB CAN / SWITCHBOARD 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)
4W-3 PHASE 120/240V	A-6, A-7, A-9, A-14	401-800	CL. 20 240V 4W DELTA 3 PHASE	COMB CAN / SWITCHBOARD 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)
4W-3 PHASE 120/240V	A-10, A-11, A-12, A-14, A-15, A-16, A-17, A-18	801-4000	CL. 20 240V 4W DELTA 3 PHASE	SWITCHBOARD 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)

NOTES:

A. CHECK WITH SMUD'S ENGINEERING DESIGNER FOR AVAILABILITY OF 3 PHASE DELTA SERVICE.
(B.) TEST SWITCH PROVIDED BY SMUD.
(C.) METERING CURRENT TRANSFORMERS PROVIDED BY SMUD.

COMMERCIAL WYE METER REQUIREMENTS

TYPE OF SERVICE	REF. PAGE NO.	MAIN SIZE AMPS.	METER	METER SOCKET	METERING & TRANSFORMERS	TEST BYPASS
2W-1 PHASE 120V	A-21	30	CL. 100 120V 2W 1 PHASE	100A 4 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
3W-1 PHASE 120/208V	A-22	0-200	CL. 200 120V 3W 1 PHASE	100A-200A 5 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 120/208V	A-21	0-100 UNDER 30KW	CL. 200 120V 4W 3 PHASE	100A 7 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 120/208V	A-22	101-200 UNDER 30KW	CL. 200 120V 4W 3 PHASE	200A 7 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 120/208V	A-21	0-100 OVER 30KW	CL. 200 120V 4W 3 PHASE	100A 7 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 120/208V	A-6, A-7, A-8, A-9	201-400	CL. 20 120V 4W 3 PHASE	COMB CAN 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)
4W-3 PHASE 120/208V	A-6, A-7, A-9, A-10, A-14	401-800	CL. 20 120V 4W 3 PHASE	COMB CAN / SWITCHBOARD 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)
4W-3 PHASE 277/480V	A-21	0-100 UNDER 30KW	CL. 200 277V 4W 3 PHASE	100A 7 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 277/480V	A-22	101-200	CL. 200 277V 4W 3 PHASE	200A 7 POINT CONTINUOUS DUTY RATED		SEE PAGE A-23
4W-3 PHASE 277/480V	A-6, A-9, A-10, A-14	201-400	CL. 20 277V 4W 3 PHASE	CT CABINET 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)
4W-3 PHASE 277/480V	A-6, A-9, A-10, A-14	401-800	CL. 20 277V 4W 3 PHASE	CT CABINET 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)
4W-3 PHASE 277/480V	A-14, A-15, A-16, A-17, A-18	801-4000	CL. 20 277V 4W 3 PHASE	SWITCHBOARD 13 POINT	3-2W (C)	10 POLE TEST SWITCH (B)

NOTES:

A. ANY WYE METER SERVICE OVER 200A, SINGLE PHASE, 120/208, IS NOT AVAILABLE.
(B.) TEST SWITCH PROVIDED BY SMUD.
(C.) METERING CURRENT TRANSFORMERS PROVIDED BY SMUD.