



POLE-TOP PRIMARY METERING INSTALLATION, CLUSTER MOUNTED 058779
(12 OR 21 KV LINE)

Asset Type: Electric Metering

Function: Design

Approved by: Quoc Hoang (QxH1)

Date: 04-15-10

Rev. #01: This document replaces PG&E Document 058779, Rev. #00. For a description of the changes, see Page 7.

This document is also included in the following manual:

- [PG&E Distribution Interconnection Handbook](#)

Purpose and Scope

This document specifies pole-top metering installations using outdoor-type instrument transformers mounted on a prefabricated aluminum bracket. Pole-top primary metering is permitted only where indoor metering is not practical. PG&E will construct all pole-top primary metering installations and will furnish and install the outdoor-type instrument transformers and aluminum mounting brackets, all necessary meters, test switches, and wiring between the instrument transformers and meters, provided the customer pays the excess costs over an indoor metering installation of equivalent capacity.

General Information

1. Metering transformers will be located on a PG&E-approved pole or structure. This pole or structure shall be provided and maintained by the customer.
2. The customer shall furnish a suitable location, either indoors or outdoors for the PG&E meters. When meters are to be installed in outdoor locations, the customer shall furnish and install an outdoor meter enclosure in accordance with [Document 033584A](#).
3. If the load to be metered requires a kilowatt demand recorder, the meter enclosure shall be of the walk-in type illustrated in [Document 033584A](#). (Provision should be made for a walk-in enclosure when there is a probability that a kilowatt demand recorder may be required in the future.)
4. The meter enclosure shall be installed in a suitable, approved location. It may be installed on the metering pole located on the customer's property. It should be located so that the secondary wires from the instrument transformers to the meter will be as short as practical. Under no circumstances should the secondary wires be longer than 50 feet in order to avoid impairment of meter accuracy.
5. The customer shall furnish and install a meter enclosure ground in accordance with the state building standards electrical code and with city and county ordinances.
6. The minimum size ground wire for the meter enclosure shall be #6 AWG copper and shall be fastened securely to an approved grounding electrode. Where installed on a pole, the meter enclosure ground wire shall be protected against mechanical injury by rigid steel conduit or armor cladding connected to the ground electrode by means of an approved conduit-grounding hub and clamp or an approved armor-grounding hub and clamp.
7. The connection of the meter enclosure ground wire to the grounding electrode must be above ground or otherwise readily accessible for inspection.
8. The customer shall furnish and install a 1-1/4 inch rigid steel galvanized conduit for meter wiring from the meter enclosure to the 8-foot level on the metering pole. The customer shall furnish and PG&E will install the necessary materials to cover the meter wiring above the 8-foot level on the metering pole.
9. Fusing of the potential transformers for outdoor primary metering shall be in accordance with the following:
 - A. Service from distribution feeder – Fuse potential transformers when tap is not fused (fuse tap if load is not too large for standard fuses).
 - B. Service from substation buses – Fuse potential transformers.
 - C. Service from PG&E transformers which supply an individual customer - Fuse potential transformers when load is supplied by transformer bank larger than 1,500 kVA (when transformer bank is 1,500 kVA or less, fuse the primary of supply transformers only).
10. Placement of the PTs and CTs on the cluster bracket can be interchanged to suit the job application.

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References	Location	Document
3-Wire Crossarm Construction 12, 17, and 21 kV Circuits	OH: Framing	015116
Installation of Grounds on Wood Pole Transmission and Distribution Lines	OH: Transformers	021904
Clearance Tables CPUC General Order 95	OH: Clearances	022158
Marking, Numbering, and Identification of Line Structures	OH: Marking	022168
Installation of Cable Risers on Wood Poles	OH: Risers/UG-1 Terminations	027742
Diagram of Connections for Metering Polyphase Loads Using Transformer-Rated Meters	OH: Meters/UG-1: Services	028163
Pole-Top Primary Metering Installations, 2.4 to 17 kV Lines	FRO: Meters	033584A
Slack Span Construction for Distribution Lines	OH: Framing	061112
25 kV Underarm Side-Break Switch, Manual and Automated	OH: Switches	066195
Engineering Material Specification #57 "Preservative Treated Wood Poles, Stubs, and Anchor Logs for Overhead Lines"	TIL	EMS57

Material**Table 1 List of Materials to Be Furnished and Installed by PG&E**

Item	Description	Code	Document Number
1	Transformer, Current, Outdoor-Type (rating as required)	-	054340
2	Transformer, Potential, Outdoor-Type (rating as required)	-	
3	Insulator, Pin (as required)	-	022088
4	Pin, Insulator Steel	-	022473
5	Fuse, Cutout (as required)	-	015225
6	Insulator, Composite, Dead-End Type (as required)	-	022088
7	Washer, Spring Clip, Galvanized, for 5/8" Bolt	033320	058778
8	Wire, Overhead (size as required)	-	059626
9	Wire, Coded, Meter, #10, 600 V	-	EMS26
10	Lead Wire, Connectors (as required)	-	-
11	High-Voltage Signs	373038	022168
12	Crossarm Assembly, 8' 0" or 9' 0", Single or Double-Arm (as required)	-	015116
13	Meter (watthour, watthour demand, etc.) (as required)	-	-
14	Test Switch, Reactiformer (as required)	-	026237
15	Dead-End Attachment, for Al, See Document 028851 , for Cu, See Document 015218	-	-
16	Guy Material (as required)	-	022178
17	Insulator Clearance Bracket, 1" Pin Thread ¹	181215	015190
18	Insulator Clearance Bracket, 1-3/8" Pin Thread ¹	181216	015190
19	Bracket, for Instrument Transformers (Aluma-Form Catalog Number GPMM-6 or Barfield Manufacturing Catalog Number BAPMMG)	181268	-
20	Air Switch, Install Per Document 033131 (switch-type, as required)	-	022635
21	Bolt, Machine, 5/8" x Length (as required)	-	058778

¹ Items 17 and 18 may be used if additional jumper clearance is required.

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Material (continued)

Table 2 List of Materials to Be Furnished by Customer

Item	Description	Code	Document Number
22	Pole, Wood, Fully Treated and PG&E Inspected (as required)	–	EMS57
23	Washer, Curved, 3", for 3/4" Bolt	195293	058778
24	Meter Enclosure, Weatherproof (see Document 033584A)	–	–
25	Coupling, PVC, 1-1/4", Slip Fit, Sloane Catalog Number CG405 or Equivalent	360410	–
26	Elbow, Type LR, PVC, 1-1/4", Female, Slip Fit, Sloane Catalog Number LR40S or Equivalent	360508	–
27	Bend, PVC, 1-1/4", 90°, R=5-3/4", Slip Fit, Schedule 80, Gray	360509	–
28	Strap, Pipe, Galvanized, Two-Hole (as required)	–	057577
29	Conduit, Rigid Steel, 1-1/4", Galvanized	390121	–
30	Conduit Fitting, Threaded (for armor wire or steel conduit, Item 33)	–	–
31	Conduit Fitting, Threaded, (for Item 29)	–	–
32	Wire, Ground, #6 Minimum Copper, Bare ¹	–	–
33	Conduit, Rigid Steel, 1/2", Galvanized (for meter enclosure ground wire) ¹	390118	–
34	Conduit, Rigid PVC, 1/2", Schedule 40 With/Coupling 10' Lengths	360368	021924
35	Conduit Grounding Hub and Clamp, (for conduit, Thomas & Betts catalog number 3932 or equivalent; for armor, Thomas & Betts catalog number 3963, or equivalent)	–	–
36	Rod, Ground, 5/8" x 8' 0" Copper Covered Steel Rod	187013	013109
37	Clamp, Ground Rod	187012	
38	Wire, Ground, PT Neutral, #6 Minimum Bare Copper	290033	–
39	Conduit, Rigid PVC, 1-1/4" Schedule 80, Gray	360408	–
40	Adapter, Female, PVC, 1-1/4", Thread to Slip Fit, Sloane Catalog Number FA1303 (or equivalent)	360511	–
41	Bolt Cover, Insulating	149042	058778
42	Grounding Assembly GR-5 With PVC Conduit	160080	021904
43	Riser Assembly (as required)	–	027742

¹ Armor clad ground wire may be used for meter enclosure ground. Omit rigid steel conduit (Item 33) when armor cladding is used.

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Service to Customer's Riser—12 kV Shown (see Note 3)**Notes**

1. High-voltage sign, Item 11 (see Table 1 on Page 2). When high-voltage supply equipment is installed on the pole, the high-voltage sign may be located on the climbing side of the pole no more than 6 inches below the bottom of the equipment. Refer to [Document 022168](#).
2. Orient the current and voltage transformers on the bracket so that the polarized primary terminal leads are connected to the incoming line without interference as shown.
3. Connect the voltage transformer ground point to the 21 kV common neutral if one is provided on the pole. Refer to [Document 027742](#) for common neutral grounding and other grounding and clearance requirements for riser construction.
4. The minimum radial clearance between the primary wire and instrument transformer secondary wires is 17-1/2 inches for 12 kV and 24 inches for 21 kV line.
5. The primary conductor open point may be constructed using flying bells (Figure 1 on Page 4), slack span dead-end construction (Figure 2 on Page 6), tension dead-end construction ([Document 015116](#)), or air switch ([Document 066195](#)).

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Service to Customer's Riser-12 kV Shown (see Note 3 on Page 5)(continued)

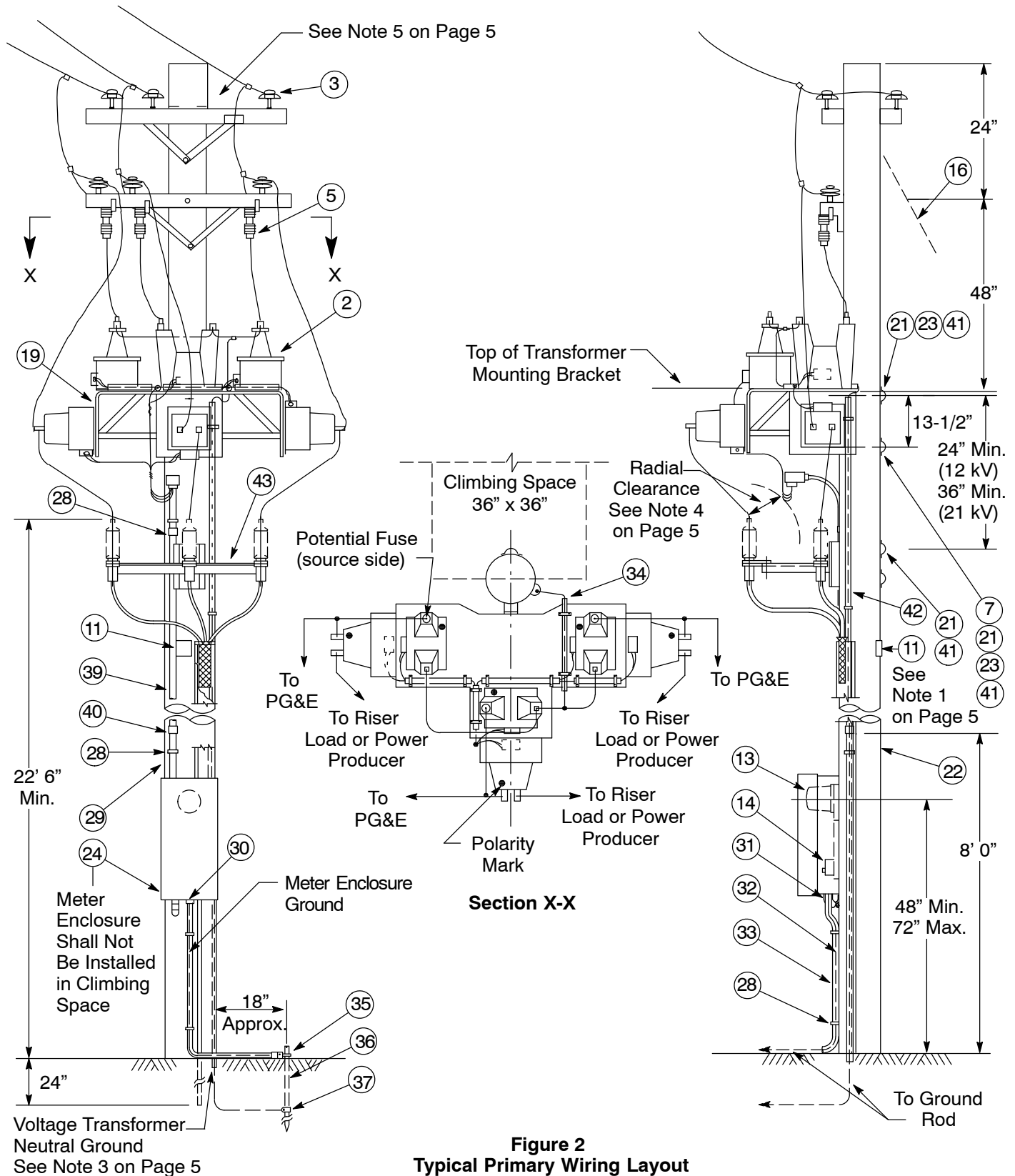


Figure 2
Typical Primary Wiring Layout
and Meter Wiring

Pole-Top Primary Metering Installation, Cluster Mounted (12 or 21 kV Line)

Revision Notes

Revision 01 has the following changes:

1. Added Note 10 to the "General Information" section on Page 1.
2. Updated the "References" section on Page 2.
3. Revised the wiring layout and meter wiring diagrams in Figure 1 on Page 4 and Figure 2 on Page 6.
4. Revised Table 1 on Page 2 and Table 2 on Page 3 to reflect the design changes in Figure 1 on Page 4 and Figure 2 on Page 6.
5. Changed the meter maximum height in Figure 1 on Page 4 and Figure 2 on Page 6.
6. Revised Note 1 in the "Overhead Service to Customer Line-12 kV Shown" section on Page 4.
7. Added Note 4 in the "Overhead Service to Customer Line-12 kV Shown" section on Page 4.
8. Revised Note 1 in the "Service to Customer's Riser-12 kV Shown" section on Page 5.
9. Added Note 5 in the "Service to Customer's Riser-12 kV Shown" section on Page 5.
10. Deleted entire section "With Service Switch on Same Pole."