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

058779

Asset Type: Electric Metering

Function: Design

Approved by: Albert Pham (A1P5)

Date: 6/5/2025

Rev. #05: This document replaces PG&E Document 058779, Rev. #04. For a description of the changes, see Page 10.

This document is also included in the following manual:

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

Purpose and Scope

This document specifies pole-top metering installations for new service and Net Generation Output Metering (NGOM) installations using outdoor-type instrument transformers cluster mounted on a prefabricated aluminum bracket. 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. The pole shall be provided, owned, installed, and maintained by the customer. See [Document 025055](#).
2. The customer shall furnish and install a meter cabinet for the revenue meter(s) on the customer-owned pole. See [Document 065374](#) for requirements on installing meter cabinets on panelboard construction.
3. PG&E meter cabinet specifications are found in PG&E "Electric and Gas Service Requirements" ([Greenbook](#)), Section 9.9 and **must** be the two (2) sockets, 40" remote metering cabinet.
4. The meter cabinet shall have a ground bus with two aluminum-bodied mechanical lugs accepting a range of #6 American Wire Gauge (AWG) through #12 AWG for the current and voltage metering circuits and one aluminum-bodied mechanical lug accepting a range of #6 AWG through 250 thousand circular mils (kcmil) to bond the meter cabinet to the ground rod. Meter panel doors shall be bonded to the meter cabinet.
5. The customer shall furnish and install a grounding electrode conductor for the meter cabinet in accordance with the California or National Electric Code and with city and county ordinances.
6. The minimum size grounding electrode conductor for the meter cabinet ground shall be #6 AWG copper and shall be fastened securely to an approved ground rod. PG&E prefers but does not require the meter cabinet ground wire to be protected against physical damage by rigid steel conduit or armored cladding. Metal conduit must be bonded to an effective, grounded, fault-current path as described in the electrical code requirements.
7. The connection of the grounding electrode conductor to the ground rod must be above ground or otherwise readily accessible for inspection.
8. Install the outdoor meter cabinet on the customer-owned pole. Ensure the meter cabinet is installed with proper height and working space clearances as required in PG&E "Electric and Gas Service Requirements" ([Greenbook](#)), Sections 5.3 – 5.3.2, 5.4.2, and 5.4.4. See [Document 063436](#), for outdoor enclosure details.
9. The customer shall furnish and install a 1-1/4 inch rigid steel galvanized conduit for the meter wiring from the meter cabinet to the 8-foot level, from grade, on the customer-owned pole.
10. The instrument transformers will be wired as a 4-wire wye on the secondary metering circuit (Figure 1). There may be certain circumstances when 3-wire delta metering will be used instead of 4-wire wye (Figure 2).
11. If one of the voltage/potential (VT) or current transformers (CT) are damaged, PG&E will replace all three (3), not just the individual damaged unit, as it is not known if the damaged device may have affected the other two (2). A new cluster bracket will be built and changed out by PG&E.
12. The high-voltage sign, item 12 in Table 1, 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](#).

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13. Orient the CT's and VT's on the bracket so that the primary terminal leads (H1 terminals) are connected to the incoming line without interference. See Figure 3.
14. Connect the VT ground point to a common neutral if one is provided on the pole. Refer to [Document 036229](#) for common neutral grounding requirements.
15. **Do not ground or bond the instrument transformer bracket.**
16. The primary conductor open point may be constructed using tension dead-end construction (Figure 4), slack span dead-end construction (Figure 5), air switch (Figure 6), or flying bells.
17. The air switch should be installed as a disconnect switch in the normally closed (energized) position. Jumpers should be installed on the load (customer) side of the switch to allow the VTs and CTs to be isolated when the switch is opened.
18. Bird flight diverters may be installed around the instrument transformer bracket to alleviate nesting on the bracket. Refer to [Document 061149](#).

Access

19. The customer must provide drive up access to the metering pole for PG&E to install, maintain and inspect its metering equipment.
20. An unobstructed path must be provided and maintained by the customer for PG&E vehicle access in the metering pole on the customer's property is not accessible from the public road.

Pole-Mounted Primary NGOMs

21. For NGOMs, downstream from the main PG&E billing meter on the customer's distribution system, all equipment is procured, installed, and maintained by the customer except for the metering bracket, metering CTs and PTs, the revenue meter, and meter test switch.
22. PG&E will provide the metering bracket, pre-wire the CT and VT secondary connections, and will deliver to the site for the customer's installer to mount on the pole and make the primary connections.

References

	Location	Document
Requirements for Customer-Owned Poles	OH: Services	025055
Primary Electric Services Requirements	OH/UG: Services/Greenbook	094676
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
Slack Span Construction for Distribution Lines	OH: Framing	061112
Electric Revenue High-Voltage Metering	EMWP	063436
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

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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 or Post (as required)	–	022088
4	Pin, Insulator Steel	–	022473
5	Cutout 44H	M330306	015225
6	3 Amp Fuse Link, Type T (Non-Exempt) 6 Amp Fuse Cartridge, ELF-LR, 17.2/23 kV, Clip Style, 11.5" (Exempt)	M333083 M330152	015225
7	Insulator, Composite, Dead-End Type (as required)	–	022088
8	Washer, Spring Clip, Galvanized, for 5/8" Bolt	M033320	058778
9	Wire, Overhead (size as required)	–	059626
10	Wire, Coded, Meter, #10, 600 V ¹	Table 2	055063
11	Connectors, Lead Wire (as required)	–	–
12	High-Voltage Sign	M373038	022168
13	Crossarm Assembly, 8' 0" or 9' 0", Single or Double-Arm (as required)	–	015116
14	Revenue Meter (as required)	–	–
15	Test Switch, Cover and Studs (as required)	–	026237
16	Dead-End Attachment, for Al, See Document 028851 , for Cu, See Document 015218	–	–
17	Guy Material (as required)	–	022178
18	Insulator Clearance Bracket, 1" Pin Thread ²	M181215	015190
19	Insulator Clearance Bracket, 1-3/8" Pin Thread ²	M181216	015190
20	Bracket, for Instrument Transformers (HUBBELL Catalog Number GPMM-6)	M181268	–
21	Air Switch, (switch-type, as required)	–	–
22	Bolt, Machine, 5/8" x Length (as required)	–	058778
23	Bolt Cover, Insulating	M149042	058778
24	Washer, Curved, 3", for 3/4" Bolt	M195293	058778
25	Conduit, Flexible, 1" Non-Metallic Liquid Tight, Graybar	–	–
26	Connector, Flexible, 1-1/4" to 1", Liquid Tight Metal, Thomas and Betts	–	–
27	Conduit Fitting, 1" Non-Metallic Liquid Tight	–	–
28	1" Liquid Light Conduit for Tail Piece	–	–
29	Cover Bushing Wildlife Protect #GS-567	M560363	–

¹ Used if additional jumper clearance is required.

² Stranded wire with terminal connectors may be used instead of solid copper.

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Material (continued)

Table 2 List of Materials to Be Furnished and Installed by Customer

Item	Description	Code	Document Number
30	Pole, Wood, Fully Treated and PG&E Inspected (as required)	–	025055
31	Meter Panel Enclosure, Outdoor Rated (Greenbook) , Section 9, Figure 9–13, Remote Metering Cabinet, minimum 40" tall and 37" wide	–	–
32	Adapter, Female, PVC, 1–1/4", Thread to Slip Fit, Sloane Catalog Number FA1303 (or equivalent)	M360511	–
33	Strap, Pipe, Galvanized, Two–Hole (as required)	–	057577
34	Conduit, Rigid Steel, 1–1/4", Galvanized	M390121	–
35	Conduit Fitting, Threaded (for armor wire or steel conduit, Item 37)	–	–
36	Conduit, Galvanized (for meter enclosure ground wire) ³	M390118	–
37	Conduit Grounding Hub and Clamp, (for conduit, Thomas & Betts catalog number 3932 or equivalent; for armor, Thomas & Betts catalog number 3963, or equivalent)	–	–
38	Rod, Ground, 5/8" x 8' 0" Copper Covered Steel Rod	M187013	013109
39	Clamp, Ground Rod	M187012	013109
40	Wire, Ground, #6 Minimum Copper, Bare	–	–
41	Wire, Ground, VT Neutral, #6 Minimum Bare Copper	M290033	–
42	Conduit, PVC, 1-1/4" Schedule 80, Gray	M360408	–
43	Grounding Assembly GR-5 With PVC Conduit	M160080	021904
44	Customer Wire, Overhead (size as required)	–	

³ May be omitted when armor cladding ground wire is used for the meter cabinet ground.

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Diagram of Connections for 4-Wire and 3-Wire Metering

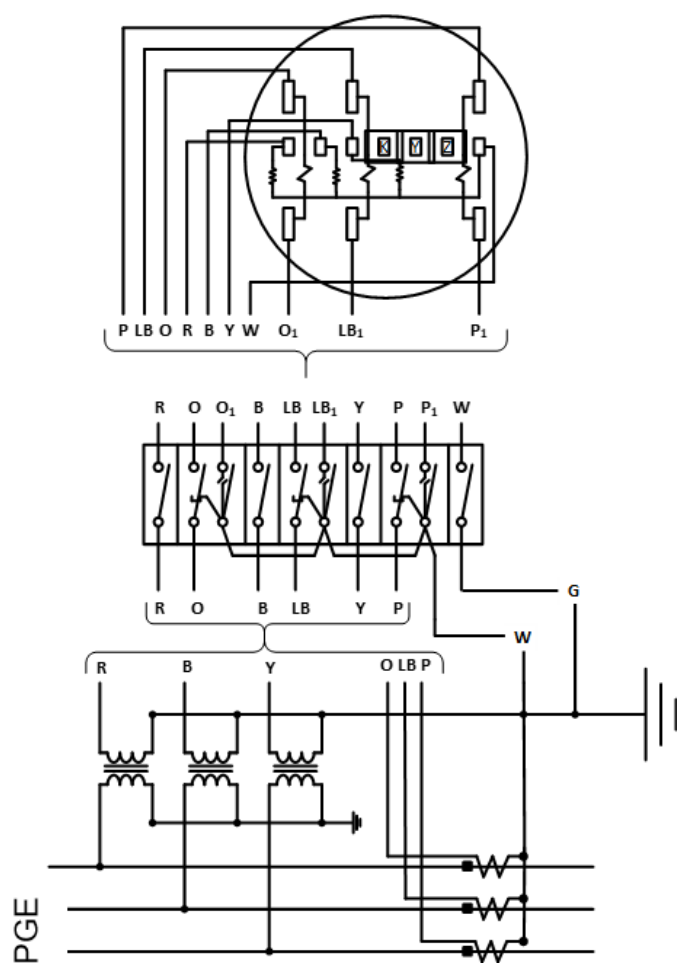


Figure 1
3-Line Diagram for 4-Wire Metering

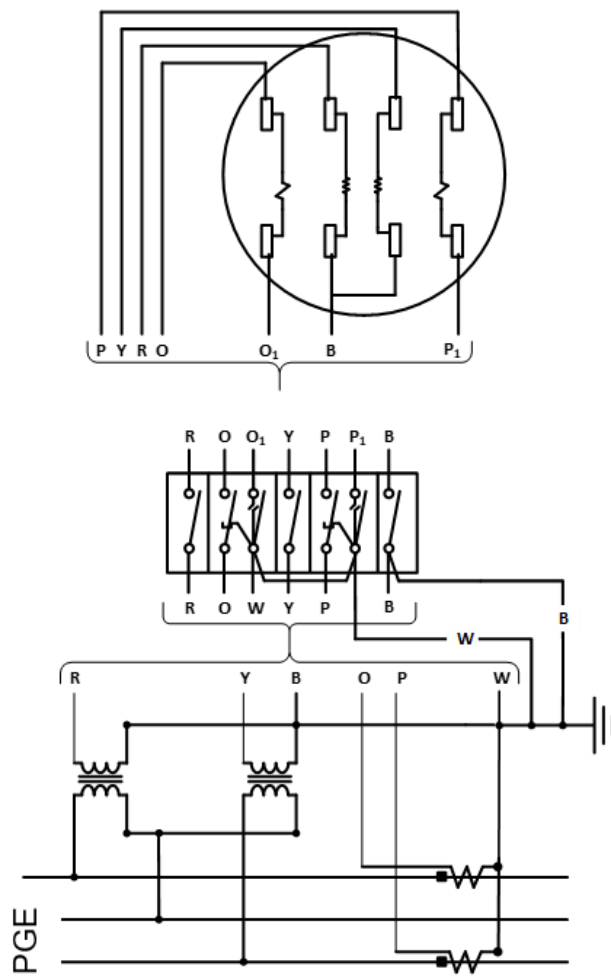


Figure 2
3-Line Diagram for 3-Wire Metering

Note:

1. Letters indicate wire color code.

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Instrument Transformer Bracket Orientation

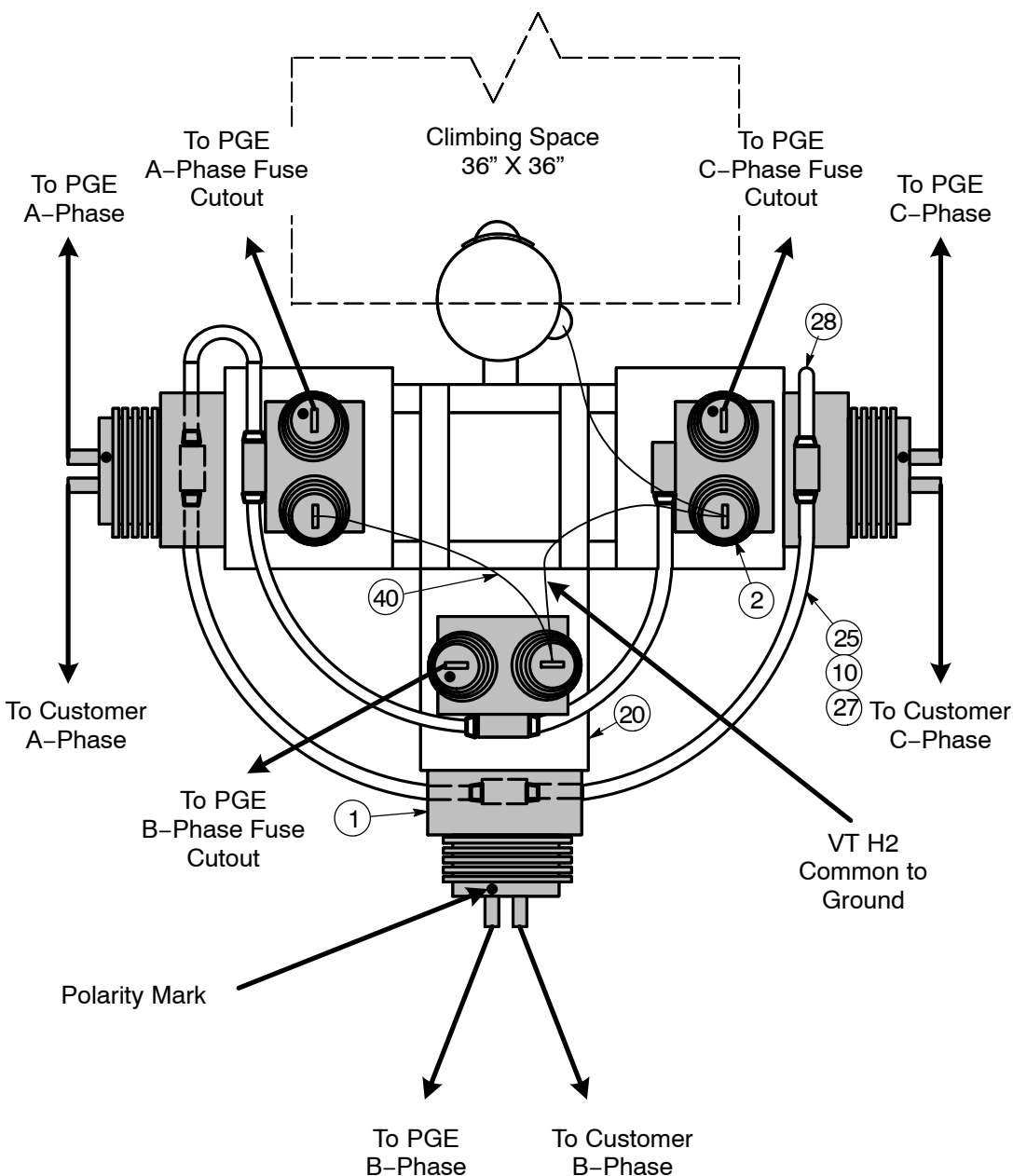


Figure 3
Bracket Construction and Orientation

Notes:

1. Polarity mark on CTs and VTs indicate H1 terminal.
2. VT and CT secondaries pre-wired on the bracket by PGE Field Metering.
3. VT and CT H1 and H2 terminal connections done by PGE Construction when mounted on the customer-owned pole.

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Overhead Service to Customer Line (2.4 kV through 21 kV)

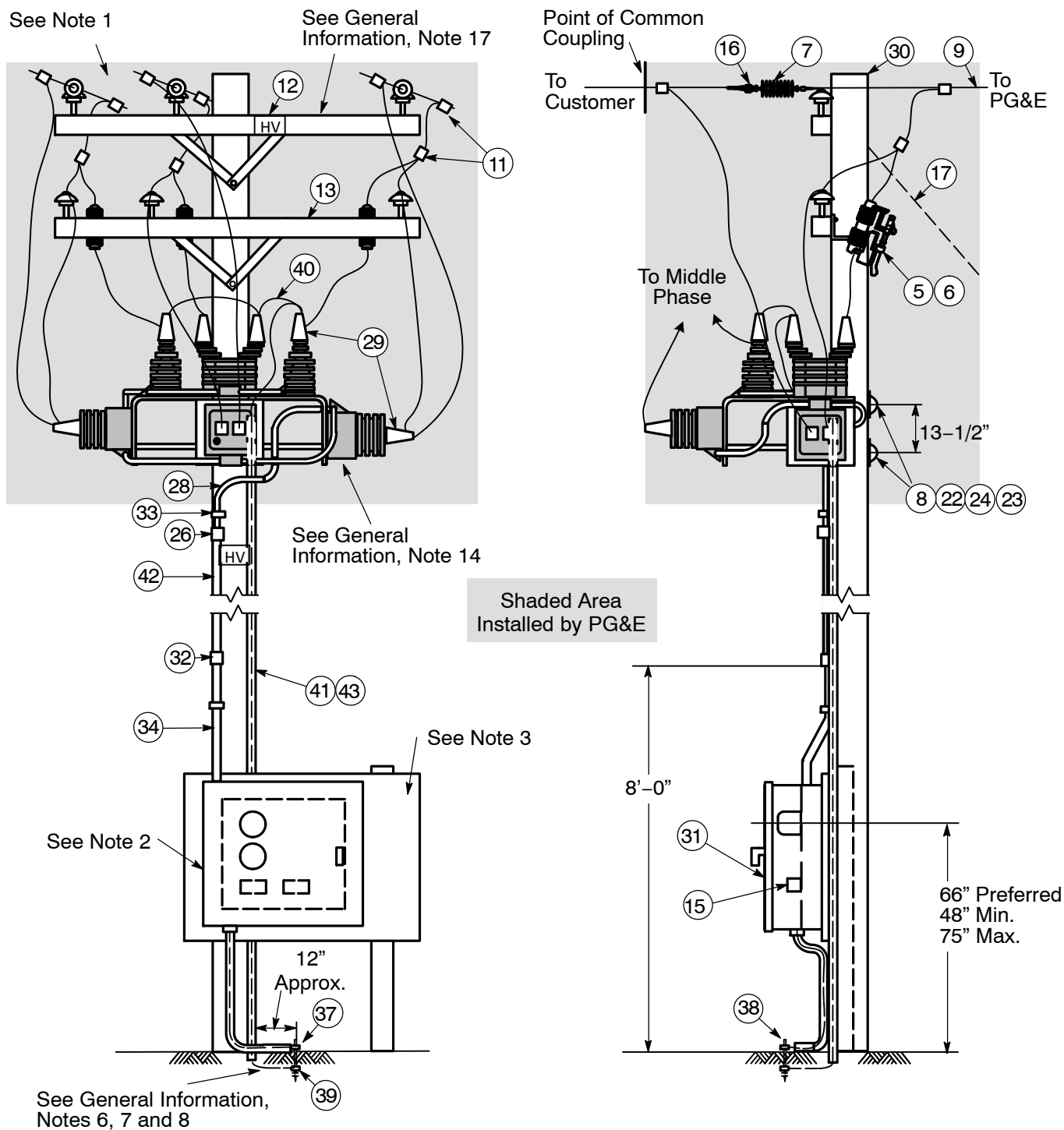


Figure 4
Primary Wiring Layout – Dead-End Construction

Notes:

1. Shaded area installed by PG&E for new service. For NGOMs, shaded area, except for the metering bracket and instrument transformers, installed by the customer.
2. The panelboard and meter cabinet shall not be installed in the climbing space.
3. See [Document 065374](#) for panelboard construction details.

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

Overhead Service to Customer Line (2.4 kV through 21 kV)

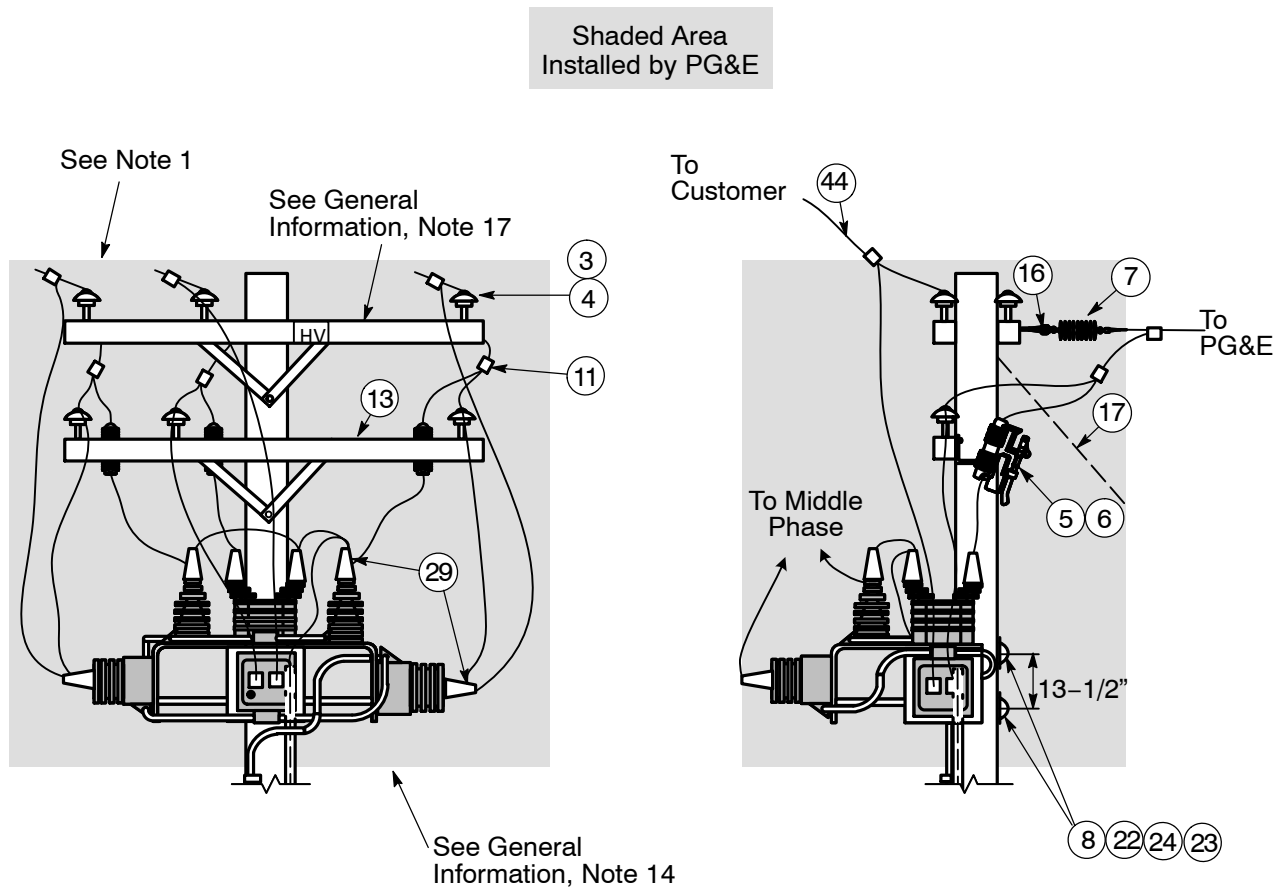


Figure 5
Primary Wiring Layout – Slack Span Construction

Note:

1. Shaded area installed by PG&E for new service. For NGOMs, shaded area, except for the metering bracket and instrument transformers, installed by the customer.

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

Overhead Service to Customer Line (2.4 kV through 21 kV)

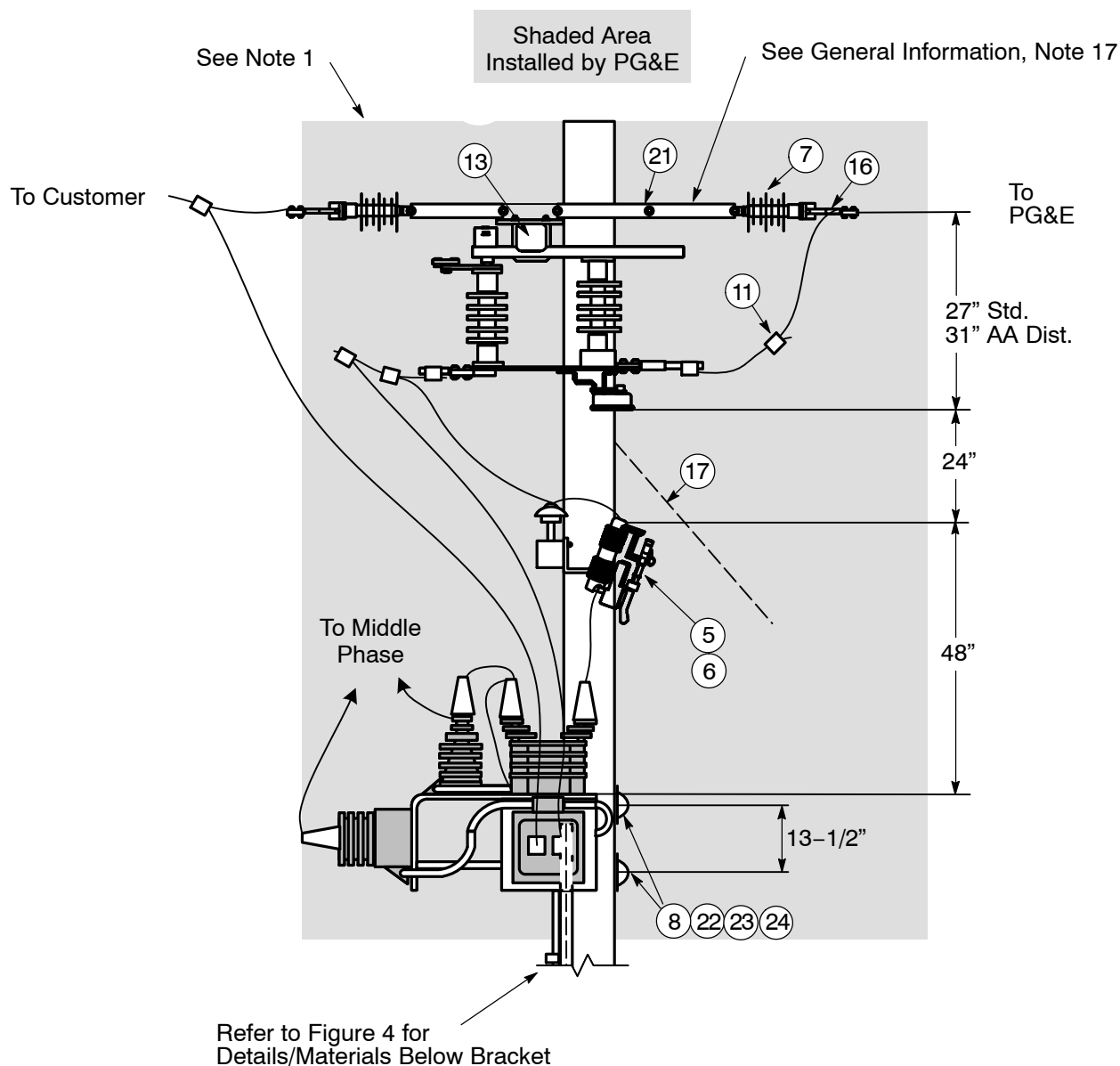


Figure 6
Primary Wiring Layout – With Air Switch

Note:

1. Shaded area installed by PG&E for new service. For NGOMs, shaded area, except for the metering bracket and instrument transformers, installed by the customer.

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Revision Notes

Revision 05 has the following changes:

1. Revised Note 3, on Page 1.