

What Has Changed - 2022-2023 Greenbook

SUMMARY

The *Greenbook* contents and standard documents are updated regularly to provide users with the most current information possible. In conjunction with this effort, the 2020-2021 *Greenbook* was reviewed and revised in its entirety by the Greenbook Committee. As a result of this review, major and minor revisions were made throughout the 2022-2023 *Greenbook*. These revisions include using simplified language, eliminating duplicate wording and figures, and providing updated and additional information. This “Overview” lists the major or noteworthy edits made to the 2020-2021 *Greenbook*. Users can reference this information to review those edits. Minor edits to the Greenbook, including grammatical changes, are **not** noted here.

The online versions of the *Electric & Gas Service Requirements*, located at www.pge.com/greenbook, are updated as quickly as possible when changes occur. The bound manual is not reprinted until the next scheduled print date regardless of changes in processes or requirements. Therefore, it is imperative that applicants for all gas and electric service projects consult the online version of this manual (www.pge.com/greenbook) before finalizing project plans.

NOTE: These revisions are effective the day the 2022-2023 Greenbook is published.

Level of Use: Informational Use

AFFECTED DOCUMENT

2020 - 2021 Electric & Gas Service Requirements (Greenbook)

TARGET AUDIENCE

Anyone who uses the Greenbook

WHAT YOU NEED TO KNOW

1 Cover

- 1.1 The date on the front cover reflects the 2022-2023 edition of the manual. Since updated editions of the Greenbook are published during the middle of the year we would like to reemphasize, to users, that the requirements are still in effect next year until a new edition has been published.
- 1.2 There are no new changes to the back cover.

2 Preface

- 2.1 Added to page i, ‘The illustrations and explanations in this manual describe how to construct and install services and equipment. Alternate designs and installations that do not meet the requirements in this manual will not be approved.

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- 2.2 Updated page ii to mimic a tariff rule change from 12 to 18 months, for the applicability of design specifications, standards, terms, and conditions following the issuance of the service contract. Applicants must also initiate work within this 18 month timeframe.
- 2.3 Presented on page iii, the new PG&E service territory map representing the 5 regions.
- 2.4 Added the regions, divisions, and cities to the Service Planning Office and Inspection Desk Contact Information tables.
- 2.5 Updated the Table of Contents, List of Tables, List of Figures with new content that was added to the manual.

3 Section 1 General

- 3.1 Expanded the information in the Arc-Flash Hazard Warning, stating all applicants or persons authorized by PG&E who are working on, working near, or observing others working on any PG&E equipment, enclosure enclosures, or other facility are required to wear flame-resistant (FR) clothing. Also, applicants and their personnel must wear the appropriate level of FR clothing for the job being performed and the tags on all FR garments must clearly identify them as flame resistant and indicate the arc rating hazard risk category (HRC).
- 3.2 Added new Section 1.2.1., Pre-Construction Meetings, to explain that all applicant-installed and shared construction jobs require a pre-construction meeting and its intent.
- 3.3 Updated Section 1.4., Changes in Requirements, to reflect a tariff rule change from 12 to 18 months, for the applicability of design specifications, standards, terms, and conditions following the issuance of the service contract. Applicants must also initiate work within this 18 month timeframe.
- 3.4 Extended Section 1.6.3., Providing Access to PG&E Electric Facilities, to explain the options and reasons on where to place underground distribution equipment when overhead distribution and transmission lines are nearby.
- 3.5 Modernized 1.6.4., Installing Transformers, to describe the changes to Electric Rule 15 and Electric Rule 16 about requests for the installation of a subsurface transformer and that these requests are not allowed when it is technically feasible to install a pad-mounted transformer.

Also separated the section to explain that agricultural services are not required to be served by a pad-mounted transformer when their loads require a 75 kVA or greater transformer. A pole-bolted transformer in overhead areas when the applicant's load does not exceed the capability of PG&E's largest available kilovolt ampere (kVA) overhead transformers may be installed.

- 3.6 Updated Section, 1.7., Connecting and Sealing Services, to state that applicants or their contractors must not paint, color, or discolor the gas and electric facilities, including the meters.

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- 3.7 Added new Section 1.10.1, Safe Landscaping Near Underground Facilities, to expand the requirements when any new vegetation are planted, to ensure that a minimum of 5 feet is maintained from underground transmission and distribution gas lines as well as distribution electric lines.
 - 3.8 Modernized Section 1.14., Determining the Service Rating, to provide additional clarification and requirements throughout the section.
 - 3.9 Section 1.16., Upgrading, Replacing, and Relocating Electric Facilities, or Adding Power Generation Sources, was updated with new requirements.
 - 3.10 Section 1.16.1., Upgrading Electric Facilities, was increased with requirements explaining the existing meter panel may not be used as a junction box to connect to existing load-side wires. The existing meter panel must be removed and covered by a solid, permanent exterior wall.
 - 3.11 Expanded Section 1.16.2., Replacing Electric Facilities with Like-for-Like, to cover multiple cases for when a panel replacement is not considered Like For Like and would be considered an upgrade by PG&E. Added new Figure 1-3, Panel Replacement Not Allowed When Over a Gas Meter Set.
 - 3.12 Subsection 1.17.1., “Single-Phase Service” was updated to align with [Electric Rule 16](#).
 - 3.13 New Subsection 1.19., Harmful Wave Form, was added to provide awareness that customers must not operate equipment that either superimposes a current of any frequency or wave form on PG&E’s system. Harmful wave forms cause interference with PG&E’s operations and service to other customers. Therefore, PG&E will adopt the IEEE Standard 519, and will require that the harmonic current drawn by customer’s equipment of any kind be in conformity with the IEEE Standard.
- 4 Section 2 Gas Service.**
- 4.1 Item B.1. in Section 2.2.1., Establishing New Gas Service, was expanded to require detailed site plans indicating property lines, roads, sidewalks, driveways, water service, sewer line, water drainage, bioswales and retaining walls.
 - 4.2 Updated the wording, requirements, links, and figures in Section 2.3.1., General.
 - 4.3 Section 2.3.6., Mobile Home Parks, was expanded with additional verbiage.
 - 4.4 Section 2.4.2., Gas Meter-Set Locations, was updated with additional requirements and guidance throughout Subsections A to D.
 - 4.5 Modifications were made to Figure 2-19, “Electric and Gas Meter Set Separation Dimensions and Clearances”, including newer style meter panels and a greater clearance to communication enclosures. The Figure notes were updated as well.

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- 4.1 A new Section 2.4.2.E., Panel Replacements and Conduit Connections to Existing Electric Panels, 400 Amps and Less, within the Gas Clearance Area, was added detailing brand new requirements for upgraded electric panels and “like-for-like” panel replacements. This section also includes new Figure 2-22, Clearance Requirements for an Existing Electric Meter/Panel, as well as Figure notes.
- 4.2 Dimensions B and D in Table 2-2, Dimensions to Figure 2-22, was updated with clarified requirements.
- 4.1 The title of Subsection 2.4.2.G. was updated to be, Requirements for Alcoves, Enclosures, Gas-Meter Cabinets, Closets, and Gas-Meter Rooms. The Section was also updated with additional requirements and information on Alcoves, gas meters, and gates.
- 4.2 Subsections throughout Section 2.4.2., were updated, including Subsection J. Meter Sets Requiring Electric Circuits for Communication.

5 Section 3 Electric Service: Underground

- 5.1 Subsection A. in Section 3.2.2., Establishing Underground Electric Service Responsibilities, was expanded to include information on Public Utility Easements (PUE) and other land rights.
- 5.2 Included, bends, couplings, end bells, and cable protectors as parts of the conduit system in item B. of Section 3.2.2. “Establishing Underground Electric Service Responsibilities”. Applicants are responsible to install these conduit system parts. Also included the conduit connector as part of the service riser conduit.
- 5.3 Added, new Subsection D. in Section 3.2.2. Establishing Underground Electric Service Responsibilities, that explains applicants must not install service conduit, meter, and service equipment in prohibited locations. These include, but are not limited to, outdoor areas less than 300 feet away from biowaste, toxic, corrosive, or similar type of unsafe substances that could be released into the air, are in the ground soil, located in open air wet ponds, or stored in a dry location.
- 5.4 Added new Section 3.2.7., Easements for PG&E Facilities, New underground distribution facilities must be designed for installation in a Public Utility Easement (PUE) outside of public streets and roads. Also, that PUEs are at least 10 feet wide for primary, secondary, and service cables and that cables should be installed around the centerline of the PUE. Refer to this section for all of the requirements. New Figure 3-3, PG&E Trench and Equipment in PUE – Example, was included in this section.
- 5.5 Added new Section 3.2.8., Clearances Around PG&E Facilities, describing that applicants must not construct structures or install equipment, including, but not limited to, buildings, homes, customer generation equipment, agricultural wells, or expansions of existing structures over, under, to the sides, or between PG&E overhead or underground facilities, either in the public right-of-way or on private property, without maintaining the proper clearances.

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- 5.6 In Section 3.3.3., “Installing Conduit for Underground Service”, verbiage was expanded to state, if large utility pipes or drains are obstructing the service path, the trench may be as deep as 10 feet to traverse under the obstructions and then transition back to the proper trench depth. Additionally, a requirement has been added for spare conduits that will be vacant for 30 days or longer to install detectable pull-tape (Code 602679) so the spare conduit can be identified during mark and locate field work. Finally, explanation was provided that applicants must be aware that underground conduits, enclosures, and substructures must not be installed in the ground or in buildings foundations before PG&E issues an approved design for the installation. Unapproved installations are considered “at risk” and the applicant assumes the risk for any work performed without requesting PG&E’s advanced approval. PG&E can charge the applicant if it is necessary to make changes to unapproved work.
- 5.7 Incorporated new Section 3.3.3.1., Galvanized Rigid Steel Conduit and Couplings, to cover when new galvanized rigid steel (GRS) conduit is used as riser conduit transitioning from the underground service conduit up to the electric meter panel. Bonding and PVC to Steel transition couplings are also explained in this section.
- 5.8 Modernized Section 3.3.4., “Installing PG&E-Only Service Trenches”, with updated and clarifying language.
- 5.9 Expanded Section 3.3.6., Selecting Backfill, with detailed requirements on compaction and reports that may need to be submitted to PG&E.
- 5.10 Modernized Section 3.3.8., Installing Joint Utility Service Trenches, with additional information on what is considered a wet facility as well as crossings and clearances.
- 5.11 Clarified Figure 3-6, Typical Joint Service Trench, and Figure 3-7, PG&E Electric and Gas Service Trench, by adding the words, “Cover” and “Trench Depth”.
- 5.12 Provided a new Section 3.3.11., Replacing Non-Standard Underground Services, to explain when applicants are relocating or upgrading their electric meter panels and they have existing, non-standard Cable in Conduit (CIC) or Direct Buried (DB) cable, it must be replaced with new PG&E service cable installed in approved service conduit. The new service and conduit run must extend from the new electric panel or termination enclosure location back to the distribution splice box or transformer. Also, it is not allowed to install a splice box along the path of the existing, non-standard DB or CIC cable, between the PG&E secondary distribution system and the panel or termination location, to shorten the length of the new service and conduit.
- 5.13 Included in Section 3.5., Mandrels, for spare conduits that will be vacant for 30 days or longer are required to install detectable pull-tape (Code 602679) so the spare conduit can be identified during mark and locate field work.

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6 Section 4 Electric Service: Overhead

- 6.1 Updated Section 4.6., Attachment Structures (Periscopes), amplifying that only a single (one) mast and weatherhead from the electric service termination and metering equipment to the service drop location is allowed. Installing more than one attachment structure is prohibited. Also, Attachment structures typically must be installed directly above the service termination and metering equipment, vertically upward to the weatherhead location. For existing installations where the meter panel is being replaced and relocated away from the gas facilities, or to achieve the minimum-required working space, the mast may be installed horizontally to be able to run back to the existing weatherhead location if it is not changing. Any allowed horizontal run of mast (conduit) should not exceed 10 feet and must not be installed on top of the roof. If a new attachment structure is installed, it should be directly above the new service termination and metering equipment. Finally, if a new meter panel is planned to be installed next to an existing meter panel and connected to the same overhead service, applicants may not install additional masts and weatherhead and are required to install a sealable gutter in conjunction with a single mast.
- 6.2 Further expanded Section 4.8., Service-Entrance Conductors, to state that, PG&E will only connect to one set (run) of service-entrance conductors exiting the mast and weatherhead. Therefore, applicants must only install one set of conductors in the service conduit. One set or run is a maximum of three conductors for single-phase and four conductors for three-phase services.

7 Section 5 Electric Metering: General

- 7.1 Revamped Section 5.2.2., Drawing Submittal Requirements for Metering and Service Termination Equipment, to updated item B.1. Single-Family Residential. For wall-mounted and pad-mounted (floor standing) equipment submittals are required for current ratings of 320 amps or above.
- 7.2 In Section 5.3.2., Prohibited Meter and Service Equipment Locations, item A. was expanded to prohibit meters in traffic medians or areas where there is traffic on both sides of the meter, any indoor or outdoor area where personal protection equipment is needed, including eye and hearing protection, and in outdoor areas less than 300 feet away from biowaste, toxic, corrosive, or a similar-type of unsafe substances that could be released into the air, are found in the ground soil, are located in open-air wet ponds, or are stored in dry locations.
- 7.3 Modernized Section 5.3.4., Electric Meter and Service Termination Equipment Rooms, throughout including requiring multiple types of drawings and site plans, included info on subtractive billing, additional language on access to meter rooms, and the distance a service can extend into a structure's and past it's outer wall. Figure 5-1, Allowable Locations for Electric Service and Meter Rooms, and the associated figure notes were updated and clarified. Figure 5-1, Detail A, was created and added to this section. Refer to this section and figures to see all of the new changes and requirements.

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- 7.4 Figure 5-3, Electric and Gas Meter Set Separation Dimensions and Clearances, was edited to include newer style meter panels and a greater clearance to communication enclosures. The Figure notes were updated to reenforce clearances for meters in cabinets and the allowance of continuous metallic conduit to curve and not have to be straight. Figure notes were added about overhead meter panels near nonpressurized wet facilities and objects not allowed in the working space below the meter.
- 7.5 Updated the requirements in Section 5.4.4., “Working Space”, including a working space must be located entirely on the applicant’s property or only located in the public right-of-way for municipality or state-owned land. Specified that wall-mounted means service and metering equipment mounted on walls, panelboard structures, poles, posts, and communication pedestals. Expanded the improved surface requirements with additional clarification and specific requirements.
- 7.6 Modernized Figure 5-4, Semi-Flush Meter Installation, and Figure 5-5, Enclosed Meter Installation, with newer style meter panels and notes.
- 7.7 Added barrier posts to Figure 5-6, Preferred Location of Conduits for Indoor and Outdoor Meter Panels and Switchboards, to show their placement when required to be installed.
- 7.8 Section 5.4.5., “Barricades” was updated to state that when barrier posts are required, they must be permanently installed, and removable barrier posts are not allowed for service and metering equipment.
- 7.9 Clarified information on what types of obstruction are allowed in Figure Note 1 for Figure 5-7, Meter Panel Clearance and Protection from Residential Driveways or Parking Spaces.
- 7.10 Added reference documents to Table 5-3, Bollard Post Materials.
- 7.11 Modernized Section 5.4.6., Meter Protection, with requirements on fencing or structures built around service and metering equipment. The requirements include increased working space and safe access provisions.
- 7.12 Section 5.5.1., Properly Identifying and Marking Meters, was expanded to state, customers installing distributed generation (e.g., solar, wind, battery storage) that is connected to the electric meter panel are required to install permanent signage affixed to the panel indicating an alternative source of generation is interconnected. Signage and maps also are required at the meter panel for the alternating current (ac) disconnect switch location when it is more than 10 feet away and out of the line of sight from the meter panel.
- 7.13 Included new verbiage in Section 5.5.3., Locking Provisions, If the main breaker or service disconnects are installed in an enclosure, the door(s) for the enclosure also must have locking provisions that accept a PG&E lock or other locking mechanism and can accommodate more than one lock. Do not use a keyed lock handle (e.g., T-handle) to secure enclosures.

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- 7.14 Modified Section 5.6.3., Fire-Pump Connections, removing the option of interconnecting fire pump cables in the termination section of the switchboard. A dedicated tap section inside the main service switchboard is the preferred option. Added another requirement that the ampacity rating of the fire pump switchboard or meter panel does not exceed the ampacity rating for main service termination equipment (e.g., main switchboard, meter panel).
- 7.15 Modernized Section 5.7.2., Main Service Disconnect Switch Rated for Amperes Interrupting Capacity (AIC), describing that for short-length service drops or laterals to meter panels rated at 225 amps or less it is not practical for PG&E to design its facilities to limit the short-circuit duty to 10,000 amps. For short-service installations, PG&E provides, on request by the applicant, the maximum-available short-circuit current based on the service equipment's capacity.
- 7.16 Expanded Section 5.7.5., Meter and Main Service Switch Sequence, to explain, in large meter rooms where additional metered switchboards may be electrically connected after the main switchboard, or where wall-mounted meter stacks are electrically connected to a tap section of a switchboard, a map and signage indicating where the main service breaker is located are required on each connected switchboard or meter stack.
- 7.17 Figure 5-17, Multiple Remote Switchboard or Meter-Panel Locations, was updated with additional text and Figure Notes.
- 7.18 5.8. Grounding was expanded with the following verbiage, applicants must not locate their grounding electrodes, grounding electrode conductors, or grounding ring conductors inside or near any PG&E electrical distribution equipment, enclosures, or vaults.
- 7.19 Updated Figure 5-19, Grounding Outside of the Sealed Section–Transformer Rated Meter, with a change to the placement of the bonding wire. A second ground rod option was removed from the figure notes and the notes were updated with clearer language. New Table 5-5, Grounding Requirements for Wall-Mounted Panels, was created in this section.
- 7.20 Updated Section 5.9.1., “Temporary Service Using Permanent Service Panels”, to allow two flat steel bars that are each a minimum of ¼ inch thick and 3 inches wide may be permanently cemented into the foundation and run vertically parallel with both sides of the meter panel, as an alternative to constructing a permanent wall to support the meter panel.
- 7.21 Modernized Section 5.10., Connecting Non-Utility Power Sources to Utility Services, with new information on who to contact at PG&E when applicants are installing customer owned generation.
- 7.22 Updated Subsection 5.10.A, with requirements to install an engraved placard (signage), when there is a line/supply side connection, installed on the metering equipment. Also two new requirements that the disconnect switch must be installed to only isolate the customer generation sources and must not disconnect any customer loads. Also the disconnect switch must not be electronically controlled from a remote location to close in the switch to the “On” (energized) position.

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7.23 Modernized Figure 5-24, SLD Manual Transfer Switch, to include backup generation and customer generation. The figure notes were also updated with new requirements.

7.24 New Section 5.10.4., References for Customer Generation, was created as a resource of documents with requirements for interconnecting all types of customer generation.

8 Section 6 Electric Metering: Residential

8.1 Created new Section 6.2.3., Electric Meter Socket Covers and Seals, to explain when PG&E will install approved blank-off covers (i.e., pie plate) and seals on unmetered sockets. Material codes for blank-off covers is also provided.

8.2 Figure 6-1, Typical Underground Service-Termination Enclosure, Combination Meter-Socket Panel (Residential, 0 Amps–225 Amps), was updated to show an alternative energy breaker that some electric meter panels come with. A new figure note was also created.

8.3 The information for Figure 6-5, Combination Meter Socket Load Center, was updated a figure note was created to specify that this type of panel is only allowed on single family homes.

8.4 New Figure 6-9, Overhead- or Underground-Fed Combination Meter and Service-Termination Panel (225 Amps, 1Ø), was added and replaced previous Figure 6-10. Table 6-2, Residential Combination (OH/UG) Meter Panel, was created to show the dimensions for Figure 6-9.

8.5 Figure 6-10 was added to Section 6. This panel rated at 320 amps is a different style than the 320 amp panel shown in Figure 6-6. Notes for Figure 6-10 were also included.

9 Section 7 Electric Metering: Nonresidential, Industrial, and Agricultural

9.1 New Figure 7-5, Underground Service Combination Meter and Current-Transformer Cabinet (600 Amps, 1Ø or 3Ø, 800 Amps 3Ø), was added to Section 7 along with a list of specific installation requirements and figure notes for this wall-mounted panel. This panel has specific dimensions and clearances and is made exclusively by Milbank Manufacturing.

9.2 The maximum ampacity ratings allowed were added to grouped meter installation Figure 7-12, Figure 7-13, and Figure 7-14, located on Page 7-17.

10 Section 8 Electric Metering: Pedestals

10.1 Modified the title of Section 8.5., Nonresidential Current-Transformer Rated Pedestals, 400 – 600 Amps 1Ø or 3Ø, 800 Amps 3Ø.

10.2 Updated the title of Table 8-3, CT Pedestal Approved Manufacturer's Model Numbers and Figures, and included another approved manufacturer for the specific pedestals in this section. The model catalog numbers were also simplified in the Table. New Table footnotes were also created.

10.3 New Figure 8-15, Nonresidential CT Pedestal – Side Mount Meter Panel (400–600 Amps, 1Ø or 3Ø, 800 Amps 3Ø), was added to this section, illustrating a newly approved pedestal model.

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11 Section 9 Electric Metering: Components and Cable Terminating Facilities

- 11.1 Updated item G in Section 9.7., Bused CT Cabinet, 3-Wire Service, 201 Amps Through 600 Amps, to say, For Virtual Net Energy Metering (VNEM) and Net Generation Output Meter (NGOM) applications only, CT cabinets rated at 600–800 amps may be allowed, including multiple cables per phase on the line and load side of this CT cabinet.
- 11.2 Updated item G in Section 9.8., Bused CT Cabinet, 4-Wire Service, 400 Amps, to say, For Virtual Net Energy Metering (VNEM) and Net Generation Output Meter (NGOM) applications only, CT cabinets rated at 600–800 amps may be allowed, including multiple cables per phase on the line and load side of this CT cabinet.
- 11.3 Expanded Table 9-3, “Minimum Wall-Mounted Pull-Section Dimensions: Residential and Nonresidential, Single-Phase or Three-Phase”, with additional foot notes 4 and 5 regarding 800 amp services and new Figure 7-5, “Underground Service Combination Meter and Current-Transformer Cabinet (600 Amps, 1Ø or 3Ø, 800 Amps 3Ø).
- 11.4 Figure 9-14 was updated to show the maximum height above the enclosure floor of 2 inches for the conduit inside the termination section. Also Figure note 7 was added to explain, switchboard pull, and termination sections must not contain line/supply side cable tap connections. A dedicated tap section or a dedicated termination enclosure must be installed.

12 Section 10 Electric Switchboards: 0 Through 600 Volts

- 12.1 Added new Item M in Section 10.2., General Requirements, to provide the following information. Ensure an Energy Reduction Maintenance Switch (ERMS) and its associated components are not installed in PG&E sections, when required to be installed. If components of the ERMS are installed in an unmetered bus location, they must be covered and barriered off from the bus and a label (e.g., ERMS NEC 240.87) must be affixed indicating the National Electric Code (NEC) rule number requiring the ERMS equipment.
- 12.2 Added new Item G. in Section 10.3.13., Underground, Service-Termination Pull Section (Located Below Ground Level), with the following requirements. The cable hanger provides support for the cables and increases the cable height above the conduits. This creates a drip loop feature that stops water from dripping onto any exposed, live energized parts. The cable hanger must be structurally strong enough to support the weight of the type (i.e., aluminum [Al] or copper [Cu]) and the maximum number of cables that could be installed for all phases. For large switchboards this could be up to 28 copper cables, mostly sized at 1,000 thousand circular mils (kcmil), with a total weight of about 1,000 pounds.
- 12.3 Modernized Section 10.6., Meter Panels, Item B., with new requirements that a single 30-inch tall meter panel door must be installed on switchboards listed in Table 10-3, Dual-Socket, Hinged, Meter-Panel Requirement, on Page 10-39. Two 15-inch tall meter panel doors are no longer allowed for these switchboards.

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- 12.4 Updated Section 10.6., Meter Panels, Item C., to state that two 15-inch tall meter panel doors are allowed to be installed on switchboards **not** listed in Table 10-3, Dual-Socket, Hinged, Meter-Panel Requirement, on Page 10-39. The two meter panel doors must come bolted together so they can swing open and close together. The bolts and nuts must be removable so the doors can also be opened or closed independently.
 - 12.5 Added new Item G. to Section 10.6., Meter Panels, to explain that for switchboards that come with dual sockets, a test switch cover plate must be installed on the spare socket.
 - 12.6 Table 10-3, Dual-Socket, Hinged, Meter-Panel Requirement, was expanded to represent the additional and new requirements described in Section 10.6., Meter Panels.
 - 12.7 Updated Figure 10-28 Low-Profile Switchboard Service Section, With CT Compartment, for Underground Service, to require a minimum height of 75 inches for the outer enclosure of these switchboards they would be covered by when installed outdoors. The 75 inches is the minimum working space height required for service and metering equipment.
- 13 Section 11 Electric Switchboards: 601 Volts Through 25,000 Volts**
- 13.1 Updated Item C. in Section 11.3., Specific Requirements for High-Voltage Switchboards, that above the CT's, shouldered eyebolts are required due to their rating for angular loading capacity.
 - 13.2 Updated Item C. in Section 11.3., Specific Requirements for High-Voltage Switchboards, that above the CT's, shouldered eyebolts are required due to their rating for angular loading capacity.
 - 13.3 Consolidated all of the PT disconnect switch requirements to Item I. in Section 11.3., Specific Requirements for High-Voltage Switchboards.
 - 13.4 Consolidated all of the requirements for mechanical lug connectors to be in Item L. in Section 11.3., Specific Requirements for High-Voltage Switchboards.
 - 13.5 Revamped Item R. in Section 11.3., Specific Requirements for High-Voltage Switchboards, with updated information reemphasizing the requirement that the entire switchgear must be certified to all applicable industry standards by a nationally recognized testing laboratory and bear the markings of the certification. Also due to the capacity of PG&E distribution circuits, primary switchgear must not have an ampacity rating greater than 600 amps. The maximum ampacity rating must be listed on the switchgear's nameplate label.
 - 13.6 Expanded the information and requirements of Item S. in Section 11.3., Specific Requirements for High-Voltage Switchboards, with the grounding electrode wire sizes for services rated at 200 amps and 600 amps. Also, for switchgear installed indoors in an electrical room only, where there is a basement, garage, or other room in the building directly below the electrical room, applicants may use a concrete-encased grounding electrode from the building's grounding system (Ufer) instead of installing a ground rod inside the termination section. Refer to Item S. for specific detailed requirements.

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- 13.7 Updated Item T. in Section 11.3., Specific Requirements for High-Voltage Switchboards, that the required termination section drawing detail on all of the switchgear drawings submitted to PG&E should show the position and details such as size, wire gauge, and measurements (Separations where applicable) of the conduit(s), conduit window, ground rods, ground wire, rigid ground bus, lugs, and additional internal components.
- 13.8 Revamped Item V. in Section 11.3., Specific Requirements for High-Voltage Switchboards, with different requirements on primary switchgear meter panel doors. The meter panel door is required to have a minimum of two sockets and a maximum of three sockets, excluding the California Independent System Operator (ISO) socket, as shown in Figure 11-2, "Hinged Meter Panel with Multiple Sockets for 2,400-V to 27,000-V Service," on Page 11-8., and Figure 11-3, on Page 11-9. Also the PG&E metering circuit must not be extended into other sections of the switchboard.
- 13.9 Created new Item W. in Section 11.3., Specific Requirements for High-Voltage Switchboards, allowing manufacturer-installed heaters or heating equipment that prevent moisture buildup inside the switchgear, if they are placed in the back of the section(s) and do not interfere with PG&E equipment or obstruct the working area around the equipment.
- 13.10 Modernized the requirements in Figure 11-1, Primary Switchboard Termination Section Pad Detail, and expanded the figure notes with instructions on the grounding electrode wire size and placement as well as on the ground rod height for switchgear with raised floors.
- 13.11 Updated Table 11-1, Bill of Materials for Concrete Pad, with a larger size grounding electrode wire for 600 amp applications and included a two bolt connector to be used with the larger 250 copper ground wire and ground rod.
- 13.12 Expanded Table 11-2, Dimensions for High-Voltage Meter Enclosures, adding a new row and Dimension K for the Insulated, Inner Safety Barrier Door, Minimum, Clearance. Dimension K is show in Figure 11-4 Typical, High-Voltage Metering Enclosure: 2,400-V Through 17,000-V Service.
- 13.13 Updated the text in Figure 11-4, Typical, High-Voltage Metering Enclosure: 2,400-Volt Through 17,000-Volt Service, to show shouldered lifting eyebolts, disconnect switch viewing window, three lugs on the rigid ground bus, and Dimension K. Also Figure Note 7. was added to state, do not install the neutral insulator bushing in the PT compartment.
- 13.14 Updated the text in Figure 11-5, Typical, High-Voltage Metering Enclosure:17,001-V Through 25,000-V Service, to show the disconnect switch viewing window and three lugs on the rigid ground bus. Also Figure Note 7. was added to state, do not install the neutral insulator bushing in the PT compartment.
- 13.15 Updated the text in Figure 11-6, Typical, High-Voltage Metering Enclosure:17,001-V Through 25,000-V Service, to show shouldered lifting eyebolts.

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13.16 Created new Section 11.5., Primary Switchgear Located Below Ground Level, to allow applicants to install primary switchgear in an electrical meter room below the ground level. PG&E requires a nonstandard design for switchgear, at all primary voltage levels, when installed below grade. This nonstandard design incorporates an additional pull section for the cable to ensure there is adequate separation between the cable terminations and the service entrance point into the switchgear to reduce the potential of water intrusion into the switchgear's termination section. PG&E requires that applicants submit drawings for review during the initial design stage of their project and before procuring a primary switchgear. This Switchgear must not be installed more than one level below grade. If the following requirements in this section cannot be met, then the switchgear must be installed at ground level. Refer to the section for all of the detailed requirements.

13.17 New Figure 11-7, Additional Side or Back Switchgear Pull Section–High Entry, along with Detail A–Cable Entrance Window, and figure notes are included in new Section 11.5.

14 Appendix A Acronyms and Glossary

14.1 Updated the definition of Barricade (Vehicular Traffic), to explain that for only some job types a sleeve-mounted vehicle barricade where the sleeves are set in concrete, might be allowed. Sleeve-mounted vehicle barricades are not allowed as protection for service and metering equipment.

14.2 Added new definition for, Pad-Mounted (Floor Standing) Equipment: Service termination and metering equipment that are manufactured to be installed and attached to permanently installed ground mounted pads or floors that are made out of concrete.

14.3 Added new definition for, Wall-Mounted Equipment: Service termination and metering equipment that are manufactured to be installed and attached to the sides of permanent structures. Wall-mounted equipment include building walls, panelboard structures, poles, posts, and communication pedestals.

14.4 Updated the definition of Wet-Utility Piping or Facilities, to include bioswales.

15 Appendix B Electric and Gas Service Documents

15.1 Added the following new and existing landscaping guides.

1. Guide to Safe Landscaping Near Gas Pipelines
2. Guide to Safe Landscaping Near Underground Electric Lines

15.2 Added the following Utility Bulletin.

1. TD-038193-B003, "New Trench, Backfill, and Warning Tape Requirements for Electric Distribution-Only Trenches".

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- 15.3 Removed the following Utility Bulletins as they were converted or incorporated in an engineering document, or incorporated into the 2022-2023 Greenbook manual, or sent to For Reference Only (FRO).
1. TD-027911-B002, Smart Pole Meter for Service to Pole-Mounted Communication Equipment was updated and converted to new engineering document 094675, SmartPole, Meter for Service to Pole-Mounted Communication Equipment.
 2. TD-027911B-003, Service to Communication Equipment on PG&E Owned Steel Streetlight Poles with Antenna Provisions, was updated and converted to new engineering document 094677, PG&E Metered Electric Service to Antenna and Communication Equipment on Company Owned Steel Streetlight Poles.
 3. TD-027911-B004, PG&E Metering Service Connections For Non-PG&E Owned Steel Streetlight Poles With Antenna and Communication Equipment, was updated and converted to new engineering document 094678, PG&E Electric Service to Antenna and Communication Equipment on Municipality Owned Steel Streetlight Poles.
 4. TD-027911-B005, PG&E Electric Service and Metering For Communication Company Equipment and Antennas on Non-PG&E Wood Poles, was updated and converted to new engineering document 094679, PG&E Metered Electrical Service to Antenna and Communication Equipment on Non-PG&E Telecommunication Owned Poles.
 5. TD-2999B-030, Technical Requirements for Electric Service Interconnection at Primary Distribution Voltages, was updated and converted to new engineering document 094676, Primary Electric Service Requirements.
 6. TD-062288-B006, Change in Required Material for Polyvinyl Chloride (PVC) Conduits, Couplings, Fittings, and Bends, was incorporated into the latest revision of 062288.
 7. TD-7001B-002, PG&E Standards and Requirements for Plug-In Electric Vehicle Interconnections, was sent to FRO.
 8. TD-7100B-005, SmartMeter Electric Network Requirements for Indoor Meter Rooms and High-Rise Building Construction, was updated and converted to new engineering document 094683, SmartMeter Electric Network Requirements for Indoor Meter Rooms and High-Rise Buildings.
 9. TD-7001B-007, Green Meter Adapter (GMA) for Customer Generation, was updated and converted to new engineering document 094684, Green Meter Adapter (GMA) for Customer Generation.

16 Appendix C Electric and Gas Engineering Documents

- 16.1 Added the following Gas Design Standards to Appendix C.
1. A-03, Gas Trench Design and Construction.

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2. A-04, Cover and Clearance Requirements for Transmission Lines, Distribution Mains, and Service Lines.
 3. A-43.2, Curb Valves.
- 16.2 Added the following electric numbered engineering documents to Appendix C. These documents have been newly created.
1. 094675, SmartPole, Meter for Service to Pole-Mounted Communication Equipment. This document is only available in the online (electronic) version of the Greenbook at www.pge.com/greenbook.
 2. 094676, Primary Electric Service Requirements.
 3. 094677, PG&E Metered Electric Service to Antenna and Communication Equipment on Company Owned Steel Streetlight Poles. This document is only available in the online (electronic) version of the Greenbook at www.pge.com/greenbook.
 4. 094678, PG&E Electric Service to Antenna and Communication Equipment on Municipality Owned Steel Streetlight Poles. This document is only available in the online (electronic) version of the Greenbook at www.pge.com/greenbook.
 5. 094679, PG&E Metered Electrical Service to Antenna and Communication Equipment on Non-PG&E Telecommunication Owned Poles. This document is only available in the online (electronic) version of the Greenbook at www.pge.com/greenbook.
 6. 094683, SmartMeter Electric Network Requirements for Indoor Meter Rooms and High-Rise Buildings.
 7. 094684, Green Meter Adapter (GMA) for Customer Generation. This document is only available in the online (electronic) version of the Greenbook at www.pge.com/greenbook.

17 End of Changes