



Asset Type: **Gas and Electric Transmission
and Distribution**

Date Issued/Updated: **August 2009**

Function: **Operations**

Page: **1** of **11**

Title: Marking and Locating PG&E Underground Facilities

Overview This work procedure (WP) provides step-by-step instructions for processing Underground Service Alert (USA) tickets and for marking and locating Pacific Gas and Electric Company (Company) underground gas, electric, and fiberoptic cable facilities.

Governing Document Utility Standard S4412, "Preventing Damage to Underground Facilities"

Safety This WP promotes safety by reducing potential hazards to Company underground facilities.

Perform all activities associated with this WP safely and in accordance with applicable safety rules, the Code of Safe Practices, and Utility Standard Practice (USP) 22, "Safety and Health Program."

Before Starting this Procedure

Personal Protective Equipment (PPE)

Field employees following this procedure must wear the following personal protective equipment (PPE) at a minimum, plus any other applicable PPE, as specified in the Code of Safe Practices:

- Hard hat (must be available)
- Traffic vest
- Proper work footwear, no sneakers allowed
- Long-sleeved shirt
- Long pants
- Gloves (must be available)
- Safety glasses (must be available)

Tools: See Attachment 3, "Mark and Locate Equipment Checklist."

Materials: See Attachment 3.

Qualification: QQ 05-01, "Mark and Locate Facilities."

Processing USA Tickets

The following procedures provide step-by-step instructions for processing USA tickets.

Note: If a buried facility is mis-marked, immediately contact the supervisor responsible for marking and locating underground facilities. The supervisor must then conduct an incident investigation according to WP1465-02, "Gas Event and Near Hit Reporting." Stop excavation until facilities are accurately located.

1. Requirements to Locate and Mark the Approximate Location

Locate and mark USA tickets within 2 working days or before the start of the excavation, whichever is later. A later time may be mutually agreed upon with the excavator. The only exception allowed is for an emergency, as defined by California Government Code §4216(d). USA ticket types include the following:

- **Emergencies:** Zero (0) hours notice.
- **Short Notice Tickets:** Less than 2 working days notice.
- **Normal:** At least 2 working days notice.
- **Extensions:** A valid on-going ticket used for extended excavation projects. A ticket can be extended up to 6 months.
- **Renewals:** Greater than 6 months or a lapsed USA ticket (a new ticket number is issued).

2. Training and Qualification Requirements

- Company mark and locate training.
- Current operator qualification when locating gas facilities.

3. Design Locate Requests

Note: The USA process is not for design purposes.

- A. The locator refers all design locate requests to the mark and locate supervisor.
- B. The mark and locate supervisor determines if the request is for design purposes.
 - If the request is for design, the mark and locate supervisor refers the excavator to local service planning personnel.
 - If the request is for excavation occurring within 14 days, the locator marks and locates the underground cable facilities.
- C. The locator documents all conversations on the USA ticket.

4. Review USA Tickets

- A. Consider the following factors when prioritizing work:
 - 1) Identify valid emergency tickets.
 - 2) Prioritize the remaining work by due date, time, and location.
 - a. Identify and prioritize short notice tickets.
 - b. Identify late tickets.
 - 3) Schedule field meets requested on USA tickets.
- B. Make contact with excavators, as necessary, and document these contacts on USA tickets. Contact the electric transmission underground supervisor if underground electric transmission is in the area.

5. Daily Check

- A. Check PPE daily.
- B. Perform a daily check to locate instruments (see WP4412-01, "Operating Procedures for Locating Instruments," and WP4412-02, "Locating Instruments Calibration Verification and Repair Procedures").
- C. Perform a daily safety check on the mark and locate vehicle.
- D. Check the vehicle for supplies daily. Refer to Attachment 3, "Mark and Locate Equipment Checklist."

6. Site Check

- A. Check for a delineation. The area to be excavated must be delineated with white chalk, flags, stakes, whiskers, or other suitable markings, including a Company identifier (name, abbreviations, or initials).
 - 1) If a delineation is not present, contact the excavator.
 - 2) If the delineation is not clear, contact the excavator.
- B. Visually inspect the area for existing surface markings and/or indications of underground facilities (e.g., risers, patches in the street, meters).
- C. Review maps for existing Company facilities within the delineated area. Identify critical and high-priority facilities that may be present in the proximity of the delineated area.

Performing USA Locates

The following is a step-by-step procedure for marking and locating underground cable facilities:

1. Respond to the Excavator “Positive Response/Positive Contact”

- A. Never provide the depth of the underground facility.
- B. If there is **no conflict with any Company underground facilities** (including gas, electric, or fiber facilities) in the delineated work area, provide a response by notifying the excavator by phone, fax, email or automated response system of “no conflict.”
 - 1) If there is no conflict with *any* company underground facilities in the delineated work area while on the jobsite, surface marks of “NO PGE” may be provided.
- C. If there is **a conflict with other Company underground facilities** (including gas, electric, or fiber facilities) in the delineated work area and the facilities are not locatable, perform the following tasks:
 - 1) Notify other affected Company departments of the conflict.
 - 2) Notify the excavator by phone, fax, email, in person, or automated response system that other Company facilities exist in the excavation area.

2. Locating Methods

Grounding: Conductive locating depends on proper grounding. **Always use an independent ground.**

Locating:

- A. The method for locating Company underground facilities is conductive (direct connect).
- B. If Company underground facilities cannot be located conductively, perform the following tasks:
 - 1) Review Attachment 2, “Non-Locatable PG&E Underground Facilities,” for possible reasons the facility cannot be located.
 - 2) Contact other personnel (e.g., corrosion, electric) for assistance, as appropriate, to locate the facility.
- C. Use the alternate methods listed below in the following order:
 - 1) Inductive clamp
 - 2) Inductive
 - 3) Passive – 50/60 hertz (Hz)
 - 4) Passive – radio frequency (RF)
 - 5) Map records – follow each step below:
 - a. If measurements exist on the maps, mark the facility using map measurements.

- b. If measurements do not exist on the maps or there are other questions, contact the local mapping department to get information from records, including as-built drawings and service orders.
- c. Complete a "Map Correction Form," noting "Unlocatable Facility," and submit it to the local mapping department.
- d. Notify the excavator and schedule a field meet. Inform the excavator that the marks are approximate and based on drawings only.

3. Facility Markings

Refer to [Table 1](#), "Color Code Identifiers (American Public Works Association [APWA] Uniform Color Code)," and [Table 2](#), "Facility Marking Abbreviations," on Page 8.

- A. Facility locators match markings to existing and expected surface conditions. Markings may include one or any combination of the following: paint, chalk, flags, stakes, whiskers, or offset markings. Use non-permanent markings on private property.
- B. Extend all marks a reasonable distance beyond the bounds of the delineated area.
- C. Marks in the appropriate color are approximately 12 inches long and spaced no more than 50 feet (ft) apart on straight-line installations. Mark the following information:
 - Material type ("STL" for steel, "PL" for plastic, "CI" for cast iron)
 - Commodity (also indicate the transmission and line number, if applicable)
 - Size
 - Number of facilities
 - Directional changes
 - Taps/tees/laterals
 - Horizontal offsets
- D. Place marks over the approximate center of the underground facility.
- E. Joint trench facilities may not be indicated on the same mark. Each commodity must be located and marked separately and shown in the appropriate color, according to the [APWA](#) Uniform Color Code (see [Table 1](#) on Page 8).

3-4" Ducts

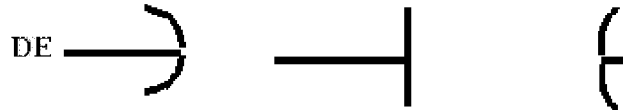
PGE

4" PL

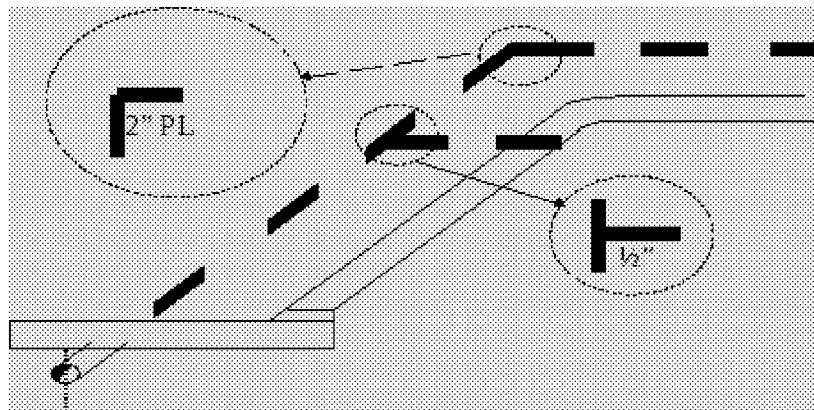
F. Mark Company facilities with "PGE" (if facilities of the same commodity owned by others are present), facility size, composition, and number of ducts, as shown on the map. Mark critical facilities accordingly: "GT" to designate gas transmission, "ET" to designate electric transmission, and "FO" to designate Company-owned telecommunications.

PGE	PGE	PGE	PGE	PGE
FO	2 - 4" Ducts	24" GT STL	1/2" PL	ET

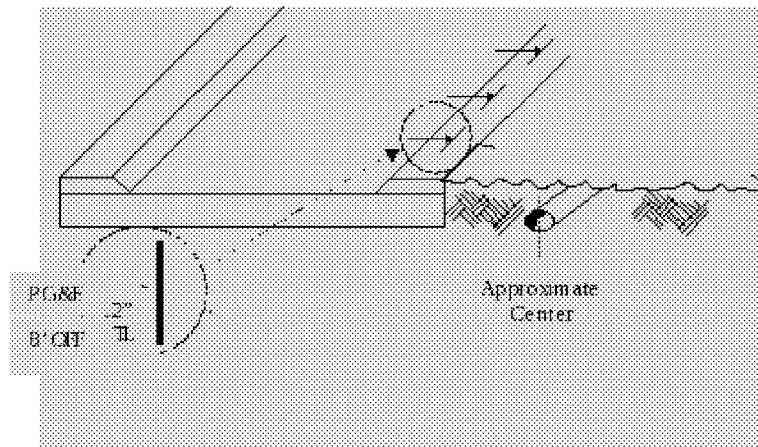
G. Indicate termination points or dead ends as follows:



H. Clearly indicate directional changes and taps/tees/laterals as follows:



I. When providing offsets, show the direction, distance to, and path of the facility. In the following example, a 12-inch steel gas main is shown in the dirt area, 8 ft to the right of the markings on the sidewalk:

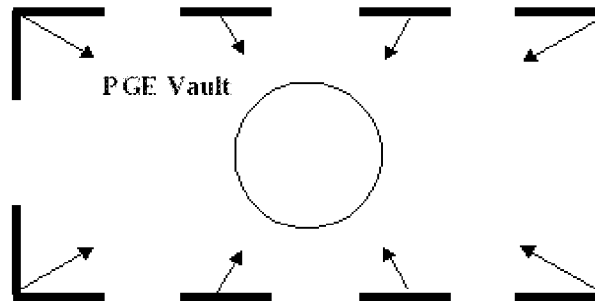


- J. Identify facilities (inserted services or mains) installed in casings as shown below. The inserted pipe is followed by the casing size and material in parentheses. In the following examples, a 2-inch plastic pipe is inserted in a 4-inch cast iron casing and a ½-inch plastic pipe is inserted in a ¾-inch steel casing:

2" PL (4" CI)

½" PL (¾" STL)

- K. Mark structures, such as vaults, to indicate the footprint of the structures.



4. Complete the Locate

- Review the map and surface markings to ensure that all facilities are located and marked.
- If other Company underground facilities exist in the delineated work area and the locator needs assistance to locate them, notify the affected Company departments of the conflict and the excavator that other Company facilities exist in the delineated work area.
- Identify the need for a field meet or standby in accordance with Attachment 1, "Determining When a Field Meet and/or Standby is Required."
- Identify potential future or existing overbuilds in the project area and report to the supervisor in accordance with WP4100-04, "Gas Overbuilds."

5. Complete the USA Ticket

- Complete all required fields on the USA ticket, and attach any photographs taken to the electronic USA ticket.
- Document all actions taken.
- Document all conversations and commitments with the excavator.

6. Check for Errors on Records

Report all errors or discrepancies per the "Map Correction Form."

7. Instruments and Material

Use only Company-approved instruments and marking products. See Gas Numbered Document M-60, "Approved Mark and Locate Instruments, Equipment, and Accessories."

Table 1. Color Code Identifiers (APWA Uniform Color Code)

Red	Electric
Yellow	Gas/oil/steam
Orange	Telephone/communications/cable TV
Blue	Water
Green	Sewer
Purple	Reclaimed water and slurry
White	USA delineation area (proposed excavation area)
Pink	Temporary survey markings

Table 2. Facility Marking Abbreviations

CI	Cast iron
DE	Dead end or termination point
ET	Electric transmission
FO	Company-owned fiberoptic telecommunication s
GT	Gas transmission
PGE	Company-owned facility
PL	Plastic
STL	Steel

Definition of Terms

APWA: American Public Works Association.

CGC: California Government Code.

CPUC: California Public Utilities Commission.

Critical facilities: All gas transmission pressure (above 60 pounds per square inch gauge [psig]) facilities and all electric facilities operating at and above 60 kilovolt (kV) are considered "critical facilities" for the purposes of this WP. Critical facilities may also be determined by the local operating area. Those facilities which, if damaged, are likely to result in difficulty controlling the gas flow due to the size, material properties, operating pressure, and/or location of the facility. When determining the difficulty of controlling gas flow, give consideration to employee and equipment availability. Critical facilities are also those electric distribution facilities which, if damaged, are likely to result in extensive (long duration) outages or outages to critical customers.

Delineated work area: The identification of a Company or an external entity's work area by pre-marking the area of proposed excavation with surface markings or by other means.

Emergency: A sudden, unexpected occurrence involving a clear and immediate danger, demanding immediate action to prevent or mitigate the loss of or damage to life, health, property, or essential public services. See California Government Code §4216(d).

High-priority facilities: High-pressure natural gas pipelines with normal operating pressures greater than 415 kilopascal (kPA) gauge (60 psig), petroleum pipelines, pressurized sewage pipelines, high-voltage electric supply lines, conductors, or cables that have a potential to ground greater than or equal to 60 kV, or hazardous materials pipelines that are potentially hazardous to workers or the public, if damaged. See California Government Code §4216(e).

Positive response (positive contact): Information about the location of an underground facility by locating and field marking the approximate location and, if known, the number of subsurface installations that may be affected by the excavation to the extent and degree of accuracy that the information is available in the records of the operator or as determined through the use of standard locating techniques other than excavating. Otherwise, advise the person who contacted the one-call center of the location of the operator's underground facility installations that may be affected by the excavation, or advise that person that the operator does not operate any underground facilities that would be affected by the proposed excavation.

Short notice: A USA ticket with less than 2 working days notice that is not an emergency.

Underground Service Alert (USA): Regional one-call notification centers for the Company service territory. There are two centers serving the Company: Underground Service Alert of Central/Northern California and Nevada (USA North) and Underground Service Alert of Southern California (USA South).

USA ticket: A document created when an excavator calls USA requesting underground facility locations before excavation.

Working days: 20 hours, per California Government Code §4216.

Revision

This WP cancels and supersedes UO Guideline G14412, "Site Delineation and Mark and Locate Surface Markings," dated 1-03.

Reference Documents

American Public Works Association (APWA)

California Government Code §4216 et seq.

Code of Safe Practices

Gas Numbered Document M-60, "Approved Mark and Locate Instruments."

Equipment, and Accessories"

Map Correction Form

OO 05-01, "Mark and Locate Facilities"

Underground Service Alert of Central/Northern California and Nevada (USA North)

Underground Service Alert of Southern California (USA South)

Utility Standard Practice (USP) 22, "Safety and Health Program"

Utility Standard S4412, "Preventing Damage to Underground Facilities"

Utility Work Procedures:

- WP1465-02, "Gas Event and Near Hit Reporting"
- WP4100-04, "Gas Overbuilds"
- WP4412-01, "Operating Procedures for Locating Instruments"
- WP4412-02, "Locating Instruments Calibration Verification and Repair Procedures"
- WP4412-04, "Field Meets and Standby -- Damage Prevention"
- WP4412-05, "Excavation Procedures for Damage Prevention"
- WP4412-06, "Handling Excavators, Contractors, and the Public Working Unsafely Around Utility Facilities"

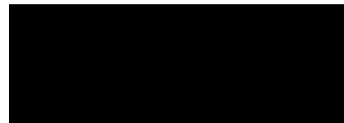
Attachments

Attachment 1, "Determining When a Field Meet and/or Standby is Required"

Attachment 2, "Non-Locatable PG&E Underground Facilities"

Attachment 3, "Mark and Locate Equipment Checklist"

Contact for More Information



Date Issued

August 2009

Approved by

Robert P. Fassett
Director

Revision History

Chg No.	Date	Description	By (LAN ID)
00	August 2009	Initiated new work procedure.	[REDACTED]