



UO Guideline G14412

ISSUING DEPARTMENT: **GD&TS and GSM&TS**
UO SPONSOR: **Director - GD&TS and Director - GSM&TS**

EFFECTIVE DATE: **11-00**
REVIEW DATE: **11-02**

PAGE NO.: **1** OF **11**

TITLE: Site Delineation and Mark and Locate Surface Marking

Purpose This guideline establishes uniform procedures for providing temporary surface markings of both planned Company excavations and of substructures in potential conflict with planned Company excavations.

This guideline supports UO Standard S4412, "Protection of Underground Infrastructure." It supersedes DCS Guideline D-G1000, effective 7-97.

Implementation Responsibilities The directors of Gas Distribution and Technical Services (GD&TS) and Gas System Maintenance and Technical Support (GSM&TS) are responsible for approving, reviewing and distributing this guideline.

General Nothing in this guideline shall obligate a department to create and maintain Company records electronically. (See Page 4 for detailed procedures.)

Definition of Terms
Acoustic Locating
A method of locating in which an audible signal is applied to a pipeline through the use of an acoustic transmitter.

Approximate Location of Subsurface Installations
A strip of land not more than 24" on either side of the exterior surface of the subsurface installation. "Approximate location" does not mean depth.

Company
Pacific Gas and Electric Company, its contractors and authorized representatives.

Computerized Facility Records
Records created and maintained electronically on a suitable storage medium. System

Conductive Locating
A method of locating in which an active signal is directly applied to the pipe or cable by way of a transmitter connected directly to that facility.

Curb Markers

Semi-permanent markers that are manufactured of composite materials and are designed to be placed, with the use of adhesives, in paved areas (asphalt or concrete).

Delineation

The identification of Company or an external entity’s work area by pre-marking the area of proposed excavation with surface markings or by other means.¹

Electronic Marker System (EMS Markers)

A utility specific device that is designed to be installed over buried facilities to enable accurate future locating and identification of those facilities. Specific locating instruments are required to identify these markers.

Inductive Locating

A method of locating in which a signal is indirectly applied to a pipe or cable by creating a magnetic field.

Locator

An employee of the Company assigned the duties of marking and locating Company UG infrastructure.

Passive Locating

A method of locating in which naturally present signals are detected through the use of a passive receiver.

Surface Indications

A technique to detect the presence and location of UG infrastructure from pavement cuts and other physical features (bell holes, trench lines, valve frames and covers, box lids, etc.) or service locations.

USA

Refers to the regional one-call notification centers for the Company’s service territory. There are two centers serving the Company: Underground Service Alert of Northern California and Underground Service Alert of Southern California.

Whiskers

A marking product made of nylon that, with the use of a drivable anchor, can be placed in either paved or non-paved areas to mark a buried facility or delineate an area for marking.

¹ Delineation is not used in this guideline to mean providing facility records to external agencies.


Date Issued/Updated

Effective: November 2000

Review Date: November 2002

Signed,

Signed,



Director
Gas Distribution and Technical Services



Director
Gas System Maintenance and Technical Support

Reference Documents UO Standard S4412, "Protection of Underground Infrastructure"
Gas Standards and Specifications, Section M

Detailed Procedures

Safety Note:

All applicable safety rules as listed in the *Code of Safe Practices* shall be followed. Additionally, use flag persons and/or electronic, vehicle-mounted "arrow boards" for traffic control where warranted.

I. General

- A. Records used for mark and locate purposes should be provided to the locators in the following order of preference:
 1. computerized facility records
 2. "as-built" drawings for unmapped facilities
 3. gas service records for unmapped facilities where the service locations are not readily identifiable by surface indications
 4. reduced-sized gas plat sheets or aperture card products
 5. electric duct maps and electric distribution system plat copies
 6. full-sized gas plat sheet copies
 7. microfiche
- B. Reduced-sized plat sheets, aperture card products and computerized facility records shall be reviewed for serviceability and currency at least monthly and will be updated as needed.
- C. White markings are used for excavation delineation. Substructure markings are of a specific color listed in the Color Code Identifiers, Section VI.
- D. Full facility operator and excavator responsibilities are detailed in Section 1, Chapter 3.1, "Protection of Underground Infrastructure," Article 2 of California Government Code Section 4216 through 4216.9 and UO Standard S4412, "Protection of Underground Infrastructure."
- E. Temporary markings should be clearly seen, functional and considerate to surface aesthetics and the local community. When marking on private property, chalk-based paint is recommended.
- F. Marking in paved areas: avoid excessive or oversized marking, especially if marking outside the excavation area. Conditions permitting, use spray chalk paints, water-based paints or an equivalent less permanent type marking. Limit length, height, and interval of marks to those recommended. Letters and numbers should not exceed 6" in height.
- G. Marking in non-paved areas: use appropriately colored stakes, lath, whiskers, flags or chalk-based paint. Select marker types that are most compatible to the purpose and marking surface.

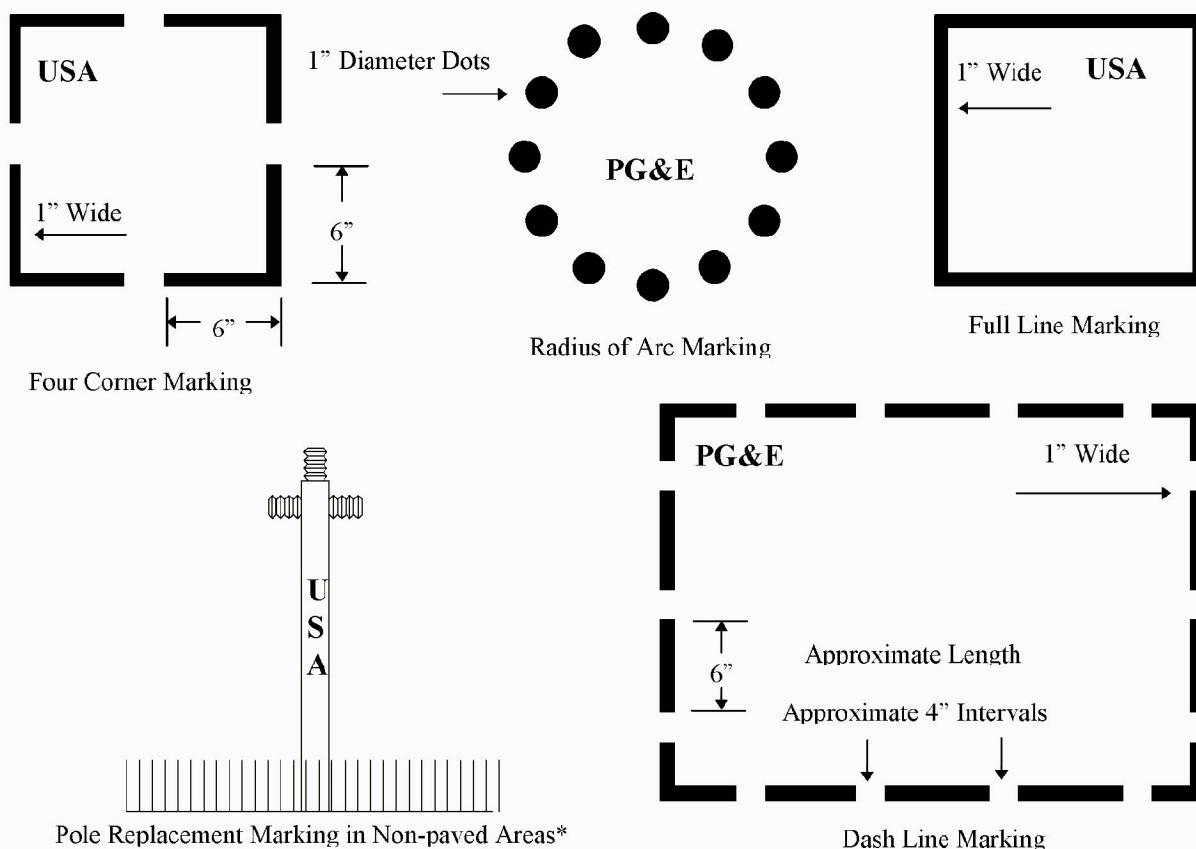
To avoid loss of surface markings in non-paved areas, the use of offset markings should be considered where feasible.

- H. Offset markings should clearly indicate the direction, distance and path of the facility or excavation.
- I. If any marking information is omitted due to site conditions, communicate the omitted data by direct contact, signs, phone, fax, etc. Any and all actions taken should be documented on the USA Ticket.
- J. When providing initial surface markings for gas facilities, conductive locating is preferred. Only if field conditions preclude the use of conductive techniques should the following alternate methods be considered: inductive, passive (power 50/60 Hz), passive (radio 14 – 22 kHz), acoustic, maps, or surface indications. Examples of situations that would preclude the use of conductive techniques are broken or damaged locating wire, no locating wire, contacts with subsurface installations and excessive distances from an ETS to the area to be located.
- K. When providing initial surface markings for electric facilities, inductive locating is preferred. Using an inductive clamp is preferred when locating primary electric facilities in areas where padmount transformers are not readily accessible. Only if field conditions preclude the use of inductive techniques should the following alternate methods be considered: passive (power 50/60 Hz), passive (radio 14 – 22 kHz), maps, or surface indications.
- L. For facilities that cannot be readily located by instruments, approved permanent markers shall be installed whenever the facility is exposed or otherwise accurately located. The type of marker, either EMS marker or curb marker, shall be selected by suitability to location.
- M. When providing initial surface markings for steel gas facilities that cannot be readily located by instruments, an ETS shall be installed whenever practicable.
- N. Facility maps shall also be reviewed for accuracy and corrected with appropriate dimensions when warranted. Mapping departments shall be made aware of any corrections.
- O. EMS markers or curb markers may be used to identify buried facilities that present limited access points, are located in heavily-trafficked roadways, or for those facilities that are not otherwise conducive to locating.
- P. New technology applications may only be utilized with the assistance and approval from Gas Distribution and Technical Services or Gas System Maintenance and Technical Support.

II. Excavation Delineation Surface Markings

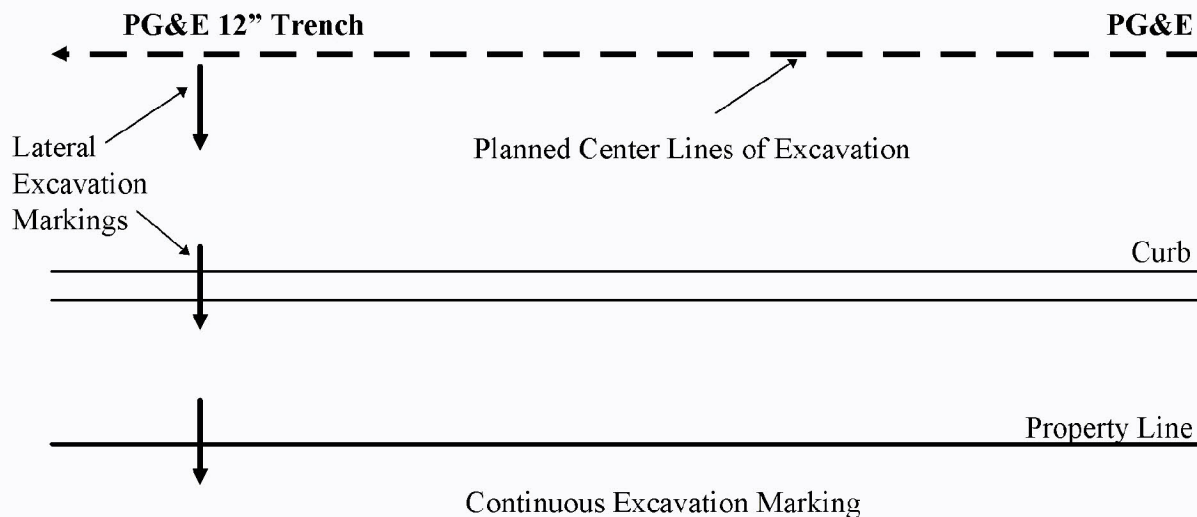
- A. Delineation of excavations is a requirement of California Government Code Section, 4216.
- B. Delineate the area to be excavated before calling USA. Delineated areas should be identified in white markings with the letters USA or Company within the pre-marked zones (see examples).
- C. If pre-marking is not practical, delineate the excavation area appropriately and communicate the method of delineation when calling in the USA request.
- D. Delineation must not be misleading, duplicative or misinterpreted as traffic or pedestrian control.

III. Single Point Excavation Examples



*Note: If placing a new pole in a new hole or placing a new anchor, stake the location of the proposed pole or anchor in addition to marking on the existing pole.

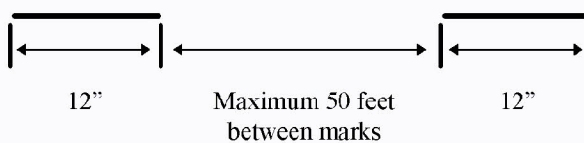
IV. Trenching, Boring or Other Continuous Type Excavations



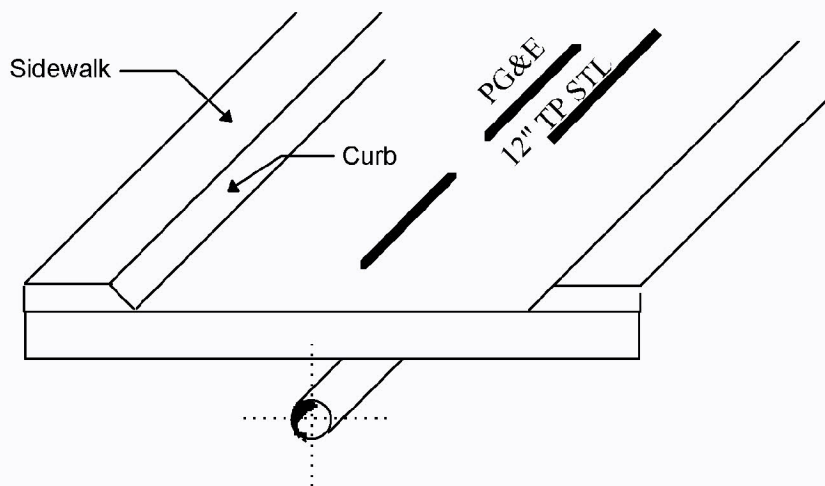
Mark the centerline of the planned excavation with 6" x 1" arrows (approximately 4' apart) to show the direction of the excavation. For boring or continuous operations where marked paving is not to be removed, mark at critical points with maximum mark separation of approximately 50'. Mark lateral excavations with arrows showing the excavation direction from the center line with marks at the curb or the property line, if crossed. Intermittently indicate the excavation width on either side of the centerline in 3" to 6" high figures. Dots may be used for curves and closer interval marking.

V. Mark and Locate Surface Markings

A. Marks in the appropriate color should be approximately 12" in length, spaced no more than 50' apart on straight line installations. Directional changes, "off-sets" and taps must be marked as frequently as needed to adequately define their location.



The marks should be placed over the approximate center of the facility.



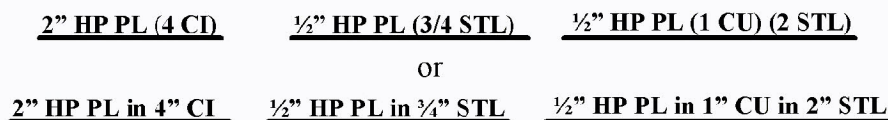
B. Identification

1. Company initials should be placed near the marks if there could be confusion as to who owns the facility. An example would be where another utility is operating a gas line in the vicinity of Company gas facilities.
2. For gas facility locations, line pressure indicators should be included. This practice will indicate to the excavator and all Company personnel the line type located. Consult appropriate facility records for line pressure. Line pressure indicators are:
 - a) T.P. = Transmission Pressure
 - b) H.P. = High Pressure
 - c) L.P. = Low Pressure

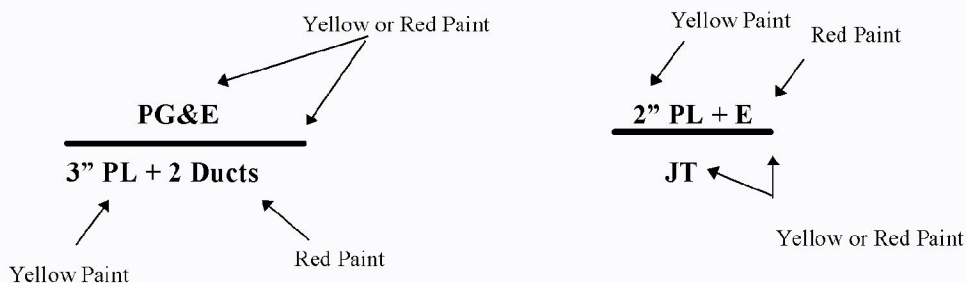
C. Information as to the size, pressure and composition of the facility should be marked if known. Examples shown are: the number of ducts in a multi-duct structure, diameter and pressure of a pipeline, and whether it is steel, plastic, bare cable, etc.



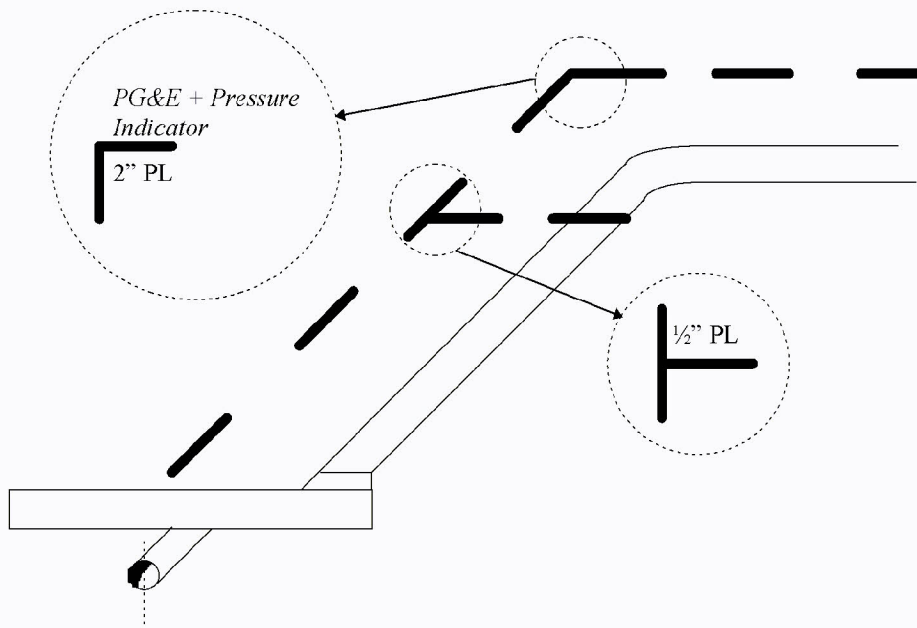
D. Facilities installed in casings should be identified as such. Examples shown are 2" HP plastic gas installed in 4" cast iron, 1/2" HP plastic gas service installed in 3/4" steel, and a 1/2" HP plastic gas service installed in 1" copper installed in 2" steel ("triple insert").



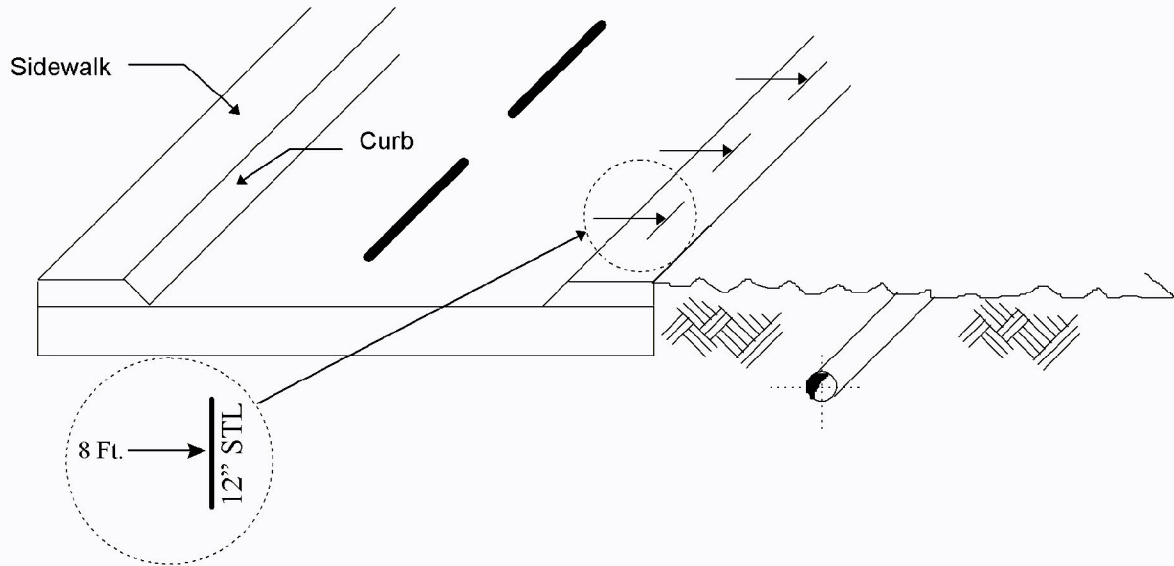
E. Joint trench facilities may be indicated on the same mark as shown.



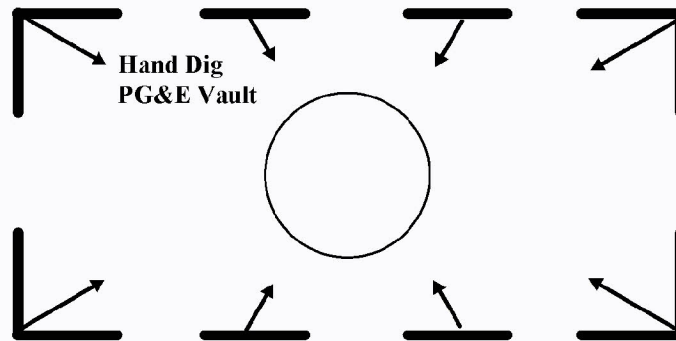
F. Changes in direction and lateral connections should be clearly indicated at the point where the change in direction or connection occurs.



G. When providing offsets, show the direction of the main and the distance to the main. In the example below, a 12" steel gas main is shown in the dirt area, 8' to the right of the markings in the sidewalk.



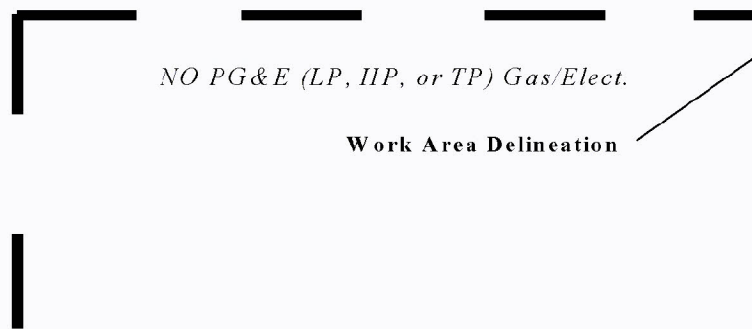
H. Structures, such as vaults, that are physically larger than obvious surface indications, should be marked so as to generally define the parameters of the structures.



I. Termination points or dead ends should be indicated as such.



J. If there is “no conflict” and the work area has been delineated, “NO Company” + (LP, HP, or TP) gas and/or electricity should be marked within the delineated work area using the appropriate color identifier. Allow adequate space for facility mark outs by others. No conflict marking indicates that there are no Company facilities (gas, electric, etc.) within the approximate location of the delineated area or within the work area as described on the USA ticket.



VI. Color Code Identifiers

Note: The APWA color code guide and California Government Code Section 4216 differ on the color code requirements for reclaimed water and slurry pipelines. Reclaimed water and slurry pipelines may be either depicted in blue or purple paint. Consult the facility owner to clarify the type of facility when necessary.

- Red** → Electric
- Yellow** → Gas/Oil/Steam
- Orange** → Telephone/Communications/Cable TV
- Blue** → Water
- Green** → Sewer
- Purple** → Reclaimed Water and Slurry
- White** → USA Delineation Area
- Pink** → Temporary Survey Markings

VII. Instruments and material: Use only Company-approved instruments and material. Approved instruments and material may be found in Section M of the Gas Standards and Specifications.