



# CGA™

Common Ground Alliance

## Damage Prevention is Good Business...



### Best Practices 8.0



Know what's **below.**  
**Call** before you dig.

Published  
March 2011

# Appendix B: Uniform Color Code & Marking Guidelines

The information contained in Appendix B is intended to be supplemental information for existing practices found within CGA Best Practices Version 2.0. The information contained within Appendix B was approved by the CGA Board of Directors on September 24, 2004.

## BEST PRACTICES CHAPTER – LOCATING & MARKING PRACTICES

**Practice Statement 4-3:** A uniform color code and set of marking symbols is adopted. (See "Uniform Color Code" Below)

### Uniform Color Code<sup>44</sup>

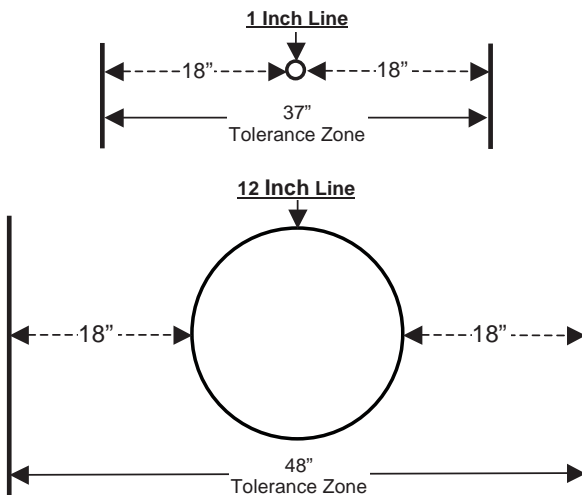
The following APWA uniform color code [ANSI Z535.1] is recommended to be adopted as the uniform color code for marking excavation sites and underground facilities in conflict with an excavation. This recommendation is not intended to preempt any existing state requirement that specifies other colors.

White	.....Proposed Excavation
Pink	.....Temporary Survey Markings
Red	.....Electric Power Lines, Cables, Conduit and Lighting Cables
Yellow	.....Gas, Oil, Steam, Petroleum or Gaseous Materials
Orange	.....Communication, Alarm or Signal Lines, Cables or Conduit
Blue	.....Potable Water
Purple	.....Reclaimed Water, Irrigation and Slurry Lines
Green	.....Sewers and Drain Lines

**References:** APWA Uniform Color Code; Existing operating practices from various States' one call centers; Existing One Call Laws from various States; ANSI Standard Z535.1 Safety Color Code

### Tolerance Zone<sup>45</sup>

CGA Best Practices 5-19 says, "The excavator observes a tolerance zone which is comprised of the width of the facility plus 18" on either side of the outside edge of the underground facility on a horizontal plane. This practice is not intended to preempt any existing state/provincial requirements that currently specify more than 18". The following examples are of tolerance zones for a 1 inch and a 12 inch line.



<sup>44</sup> TR-2001-05: Amendment Approved by CGA Board on September 24, 2004.

<sup>45</sup> TR-2010-01A: Amendment Approved by CGA Board on September 10, 2010.

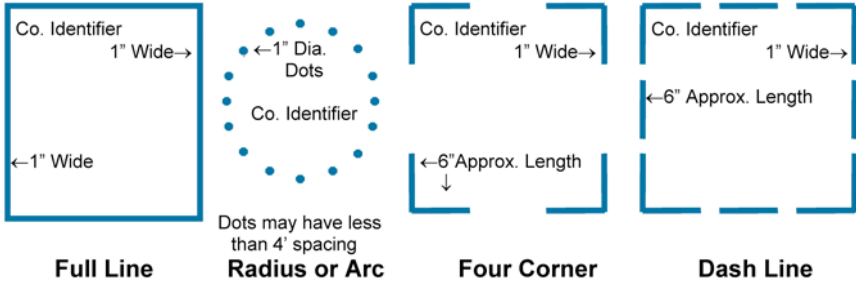
**BEST PRACTICES CHAPTER – EXCAVATION PRACTICES**

**Practice Statement 5-2:** *When the excavation site cannot be clearly and adequately identified on the locate ticket, the excavator designates the route and/or area to be excavated using white premarking prior to the arrival of the locator. (See “Guidelines for Excavation Delineation” Below)*

**Guidelines for Excavation Delineation<sup>46</sup>**

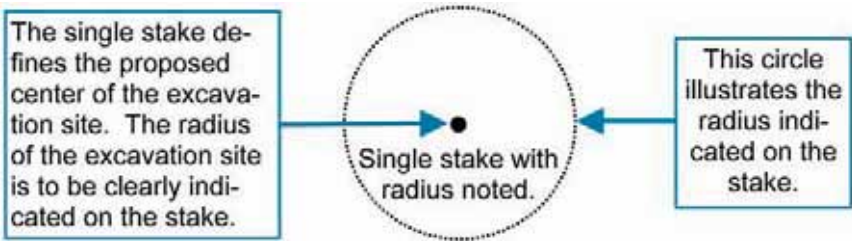
The following marking illustrations are examples of how excavators may choose to mark their area of proposed excavation. The use of white marking products (e.g. paint, flags, stakes, whiskers or a combination of these) may be used to identify the excavation site.

**Single Point Excavations Markings**



Delineate in white paint the proposed area of excavation through the use of: a continuous line, dots marking the radius or arcs, dashes marking the four corners of the project or dashes outlining the excavation project. Limit the size of each dash to approximately 6" to 12" in length and 1" in width with interval spacing approximately 4' to 50' apart. The maximum separation of excavation marks is to be reduced to a length that can be reasonably seen by the operator's locators when the terrain or excavation site conditions warrant it. Dots of approximately 1" diameter are typically used to define arcs or radii and may be placed at closer intervals in lieu of dashes.

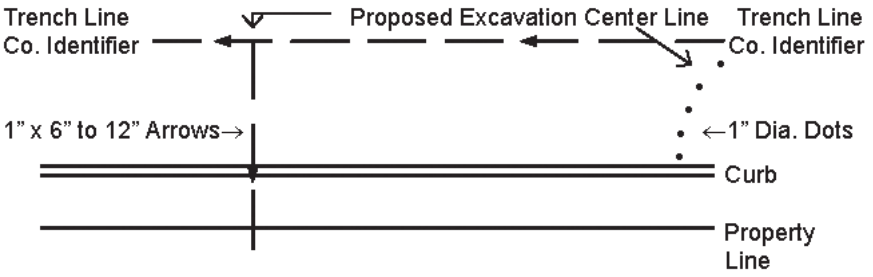
**Single Stake Marking Center Point of Excavation Site**



When an excavation site is contained within a 50' maximum radius, or less, it can be delineated with a single stake that is positioned at the proposed center of the excavation. If the excavator chooses this type of delineation they must convey that they have delineated the excavation site with a single stake at the center of the excavation and include the radius of the site in the notification to the One Call Center. This single stake is to be white in color with the following information: excavator's company identifier (name, abbreviations, or initials) and the radius of the excavation site in black letters on the stake or with a notice attached to the stake.

<sup>46</sup> TR-2001-05: Amendment Approved by CGA Board on September 24, 2004.

### ***Trenching, Boring, or Other Continuous Type Excavations***



### ***Continuous Excavation Marking***

Mark in white paint the proposed centerline of planned excavation 6" to 12" x 1" arrows, approximately 4' to 50' apart to show direction of excavation. The maximum separation of excavation marks is to be reduced to a length that can be reasonably seen by the operator's locators when the terrain at an excavation site warrants it. Mark lateral excavations with occasional arrows showing excavation direction from centerline with marks at curb or property line if crossed. Dots may be used for curves and closer interval marking.

### ***Stakes, Flags or Whiskers Excavation Markers***



Delineate the proposed area of excavation through the use of: stakes, flags or whiskers to mark radius or arcs, the four corners of the project or outlining the excavation project instead of using spray paint. Limit the interval spacing to approximately 4' to 50'. The maximum separation of excavation marks is to be reduced to a length that can be reasonably seen by the operator's locators when the terrain at an excavation site warrants it. Stakes, flags or whiskers provided to illustrate arcs or radii may be placed at closer intervals in order to define the arc or radius. Stakes, flags or whiskers are white in color with the excavator's company identifier (name, abbreviations, or initials) provided on the stake, flag or whisker.

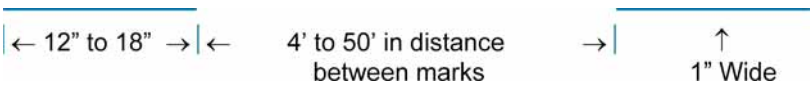
## BEST PRACTICES CHAPTER – LOCATING & MARKING PRACTICES

**Practice Statement 4-3:** A uniform color code and set of marking symbols is adopted. (See "Guidelines for Operator's Facility Field Delineation" Below)

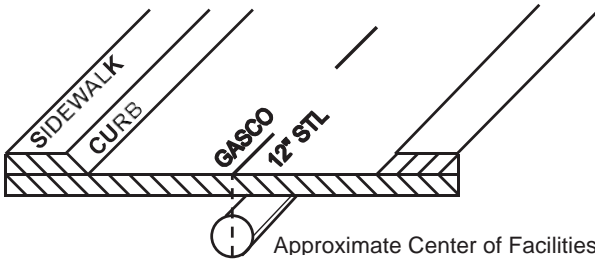
### Guidelines for Operator's Facility Field Delineation<sup>47</sup>

Operator markings of facilities include; the appropriate color for their facility type; their company identifier (name, initials, or abbreviation) when other companies are using the same color, the number and width of their facilities and a description of the facility (HP, FO, STL etc). Use paint, flags, stakes, whiskers or a combination to identify the operator's facility(s) at or near an excavation site.

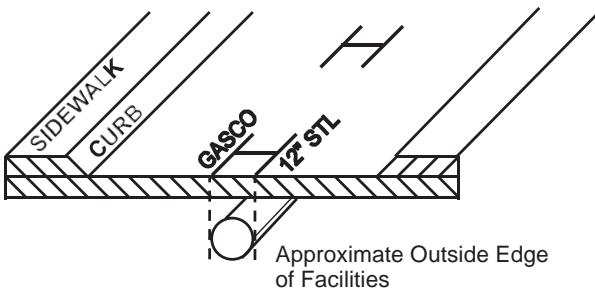
1. Marks in the appropriate color are to be approximately 12" to 18" in length and 1" inch in width and separated by approximately 4' to 50' in distance as an example. When marking facilities the operator is to consider the type of facility being located, the terrain of the land, the type of excavation being done and the method to adequately mark its facilities for the excavator.



2. The following marking illustrations are examples of how an operator may choose to mark their subsurface installations
  - a. **Single Facility Marking:** Used to mark a single facility. This can be done in one of two ways; either placing the marks over the approximate center of the facility or,



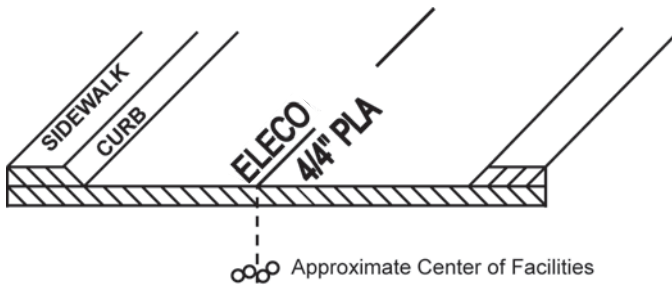
placing the marks over the approximate outside edges of the facility with a line connecting the two horizontal lines (in the form of an H) to indicate there is only one facility. These examples indicate an operator's 12" facility. When a facility can be located or toned separately from other facilities of the same type it is marked as a single facility.<sup>48</sup>



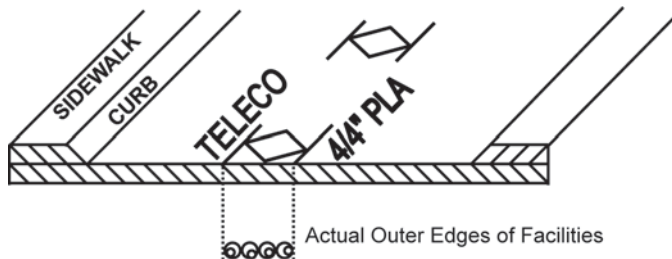
- b. **Multiple Facility Marking:** Used to mark multiple facilities of the same type (e.g. electric), where the separation does not allow for a separate tone for each facility but the number and width of the facilities is known. Marks are placed over the approximate center of the facilities and indicate the number and width of the facilities. This example indicates 4 plastic facilities that are 4" in diameter (4/4" PLA).

<sup>47</sup> TR-2001-05: Amendment Approved by CGA Board on September 24, 2004.

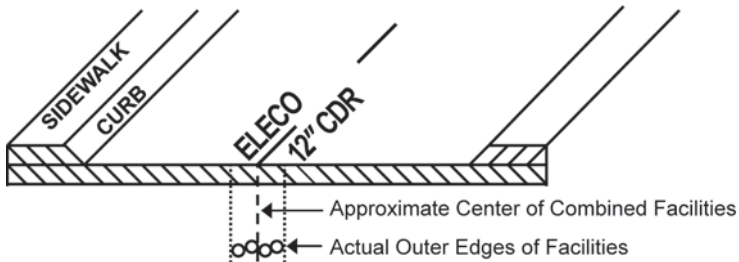
<sup>48</sup> TR-2010-01B: Amendment Approved by CGA Board on September 10, 2010.



- c. **Conduit Marking:** Used for any locatable facility being carried inside conduits or ducts. The marks indicating the outer extremities denote the actual located edges of the facilities being represented. An example would be 4 plastic conduits that are 4" in diameter (4/4" PLA), and the marks are 16" apart indicating the actual left and right edges of the facilities.

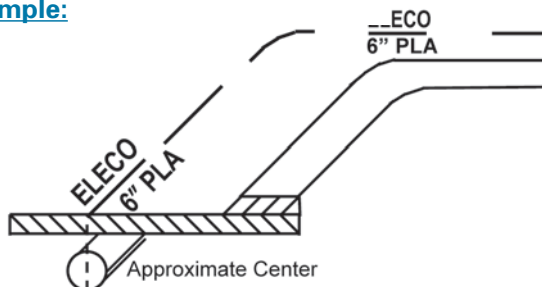


- d. **Corridor Marking:** Used to mark multiple facilities of the same type (e.g. electric), in the same trench where the total number of facilities is not readily known (operator has no record on file for the number facilities) and that are bundled or intertwined. Marks are placed over the approximate center of the facilities and indicate the width of the corridor. The width of the corridor is the distance between the actual located outside edges of the combined facilities. This example indicates a 12" corridor (12" CDR).

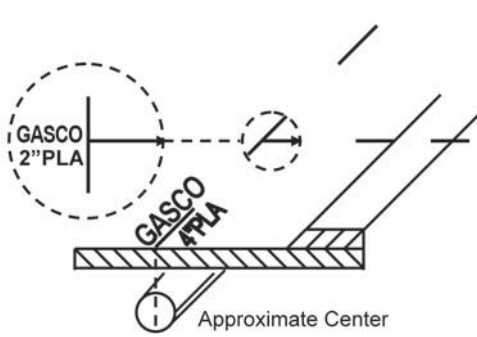


3. Changes in direction and lateral connections are to be clearly indicated at the point where the change in direction or connection occurs with an arrow indicating the path of the facility. A radius is indicated with marks describing the arc. When providing offset markings, (paint or stakes), show the direction of the facility and distance to the facility from the markings.

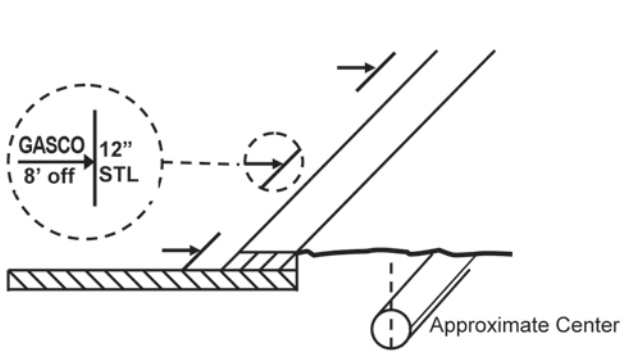
**Radius Example:**



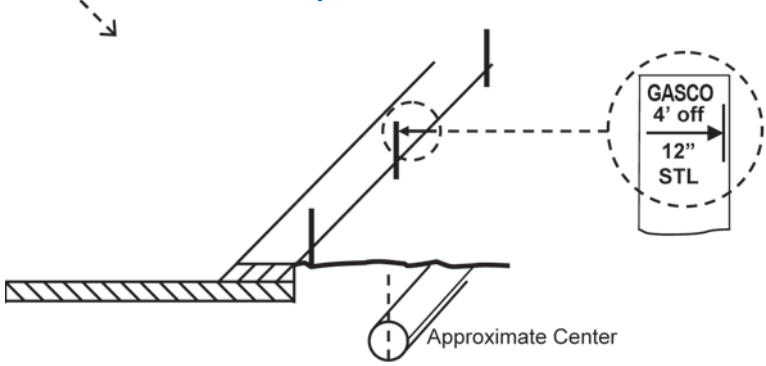
**Lateral Connection Example:**



**Painted Offset (off) Example:**



**Staked Offset (off) Example:**



- An operator's identifier (name, abbreviation or initials) is to be placed at the beginning and at the end of the proposed work. In addition to the previous, subsequent operators using the same color will mark their company identifier at all points where their facility crosses another operator's facility using the same color. The maximum separation of identifiers is to be reduced to a length that can be reasonably seen by the excavator when the terrain at the excavation site warrants it.

CITYCO

ELECO

TELECO

- Information as to the size and composition of the facility is to be marked at an appropriate frequency. Examples are: the number of ducts in a multi-duct structure, width of a pipeline, and whether it is steel, plastic, cable, etc.

TELECO  
9/4" PLA

GASCO  
4" PLA

WATERCO  
12" STL

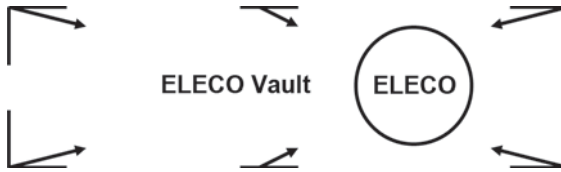


6. Facilities installed in a casing should be identified as such. Two examples are: 6" plastic in 12" steel = 6"PLA/12"STL and fiber optic in 4" steel = FO(4"STL).

GASCO  
6"PLA/12"STL

TELECO  
FO(4"STL)

7. Structures, such as vaults, inlets, lift stations that are physically larger than obvious surface indications, are to be marked so as to define the parameters of the structure.



8. Termination points or dead ends are to be indicated as such.



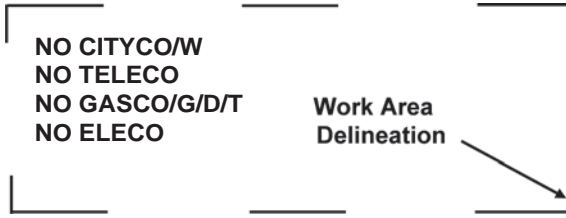
9. When there is "No Conflict" with the excavation complete one or more of the following:

- Operators of a single type of facility (e.g. TELECO) would mark the area "NO" followed by the appropriate company identifier in the matching APWA color code for that facility (e.g. "NO TELECO")
- Operators of multiple facilities would mark the area "NO" followed by the appropriate company identifier in the matching APWA color code for that facility with a slash and the abbreviation for the type of facility that there is "No Conflict" (e.g. "NO GASCO/G/D"). The example illustrates that GASCO has no gas distribution facilities at this excavation site. The abbreviation for; gas transmission facilities is "/G/T", electric distribution is "/E/D" and electric transmission is "E/T" these should be used when appropriate.
- Place a clear plastic (translucent) flag that states "No Conflict" in lettering matching the APWA color code of the facility that is not in conflict. Include on the flag the operator's identifier, phone number, a place to write the locate ticket number and date. Operators of multiple facilities would indicate on the flag, which facilities were in "No Conflict" with the excavation as in the previous example.
- If it can be determined through maps or records that the proposed excavation is obviously not in conflict with their facility (s) the locator or operator of the facility may notify the excavator of "No Conflict" by phone, fax, or email, or through the One Call Center, where electronic positive response is used. Operators of multiple facilities would indicate a "No Conflict" for each facility as in the previous examples.
- Place "No Conflict" markings or flags in a location that can be observed by the excavator and/or notify the excavator by phone, fax, or email that there is "No Conflict" with your facilities. When the excavation is delineated by the use of white markings, place "No Conflict" markings or flags in or as near as practicable to the delineated area.

\* Caution - Allow adequate space for all facility mark-outs.



“No Conflict” indicates; that the operator providing the “No Conflict” has no facilities within the scope of the delineation, or when there is no delineation, there are no facilities within the work area as described on the locate ticket.



### Color Code Identifiers

<b>White</b>	Proposed Excavation
<b>Pink</b>	Temporary Survey Markings
<b>Red</b>	Electric Power Lines, Cables, Conduit and Lighting Cables
<b>Yellow</b>	Gas, Oil, Steam, Petroleum or Gaseous Materials
<b>Orange</b>	Communication, Alarm or Signal Lines, Cables or Conduit
<b>Blue</b>	Potable Water
<b>Purple</b>	Reclaimed Water, Irrigation and Slurry Lines
<b>Green</b>	Sewers and Drain Lines

### Common Abbreviations:

#### Facility Identifier

CH	Chemical
E	Electric
FO	Fiber Optic
G	Gas
LPG	Liquefied Petroleum Gas
PP	Petroleum Products
RR	Railroad Signal
S	Sewer
SD	Storm Drain
SS	Storm Sewer
SL	Street Lighting
STM	Steam
SP	Slurry System
TEL	Telephone
TS	Traffic Signal
TV	Television
W	Water
W	Reclaimed Water “Purple”

### Underground Construction Descriptions

C	Conduit
CDR	Corridor
D	Distribution Facility
DB	Direct Buried
DE	Dead End
JT	Joint Trench
HP	High Pressure
HH	Hand Hole
MH	Manhole
PB	Pull Box
R	Radius
STR	Structure (vaults, junction boxes, inlets, lift stations)
T	Transmission Facility

### Infrastructure Material

ABS	Acrylonitrile - Butadiene - Styrene
ACP	Asbestos Cement Pipe
CI	Cast Iron
CMC	Cement Mortar Coated
CML	Cement Mortar Lined
CPP	Corrugated Plastic Pipe
CMP	Corrugated Metal Pipe
CU	Copper
CWD	Creosote Wood Duct
HDPE	High Density Polyethylene
MTD	Multiple Tile Duct
PLA	Plastic (conduit or pipe)
RCB	Reinforced Concrete Box
RCP	Reinforced Concrete Pipe
RF	Reinforced Fiberglass
SCCP	Steel Cylinder Concrete Pipe
STL	Steel
VCP	Vertrified Clay Pipe

### Guide for Abbreviation Use

This is a guide for placing the above abbreviations in the field. The Company Identifier is to be placed at the top or at the left of the abbreviations. Place the abbreviations in the following order, Company Identifier / Facility Identifier / Underground Construction Descriptions / Infrastructure Material (e.g. TELECO/TEL/FO/PLA). This example indicates that TELECO has a Telecommunication Fiber Optic line in a single Plastic conduit. The use of the abbreviation /TEL is not necessary, because the orange marking would indicate that the facility was a communication line, but its use is optional. To leave out one or more of the abbreviation types you would continue to follow the order of the abbreviations above leaving out the slash and abbreviation that does not apply (e.g. /TEL), the result would be the following (e.g. TELECO/FO/PLA).