Marking Standards
Quick Reference

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Uniform Color Code and Marking Guidelines

The information contained in this appendix is intended to supplement information for existing practices found within CGA Best Practices.  

BEST PRACTICES CHAPTER 4—LOCATING AND MARKING

Practice Statement 4–3: Color Code: A uniform color code and set of marking symbols is adopted nationwide.

Uniform Color Code

The following APWA uniform color code (ANSI Z535.1) shall 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.

PROPOSED EXCAVATION

TEMPORARY SURVEY MARKINGS

ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES

GAS, OIL, STEAM, PETROLEUM OR GASEOUS MATERIALS

COMMUNICATION, ALARM OR SIGNAL LINES, CABLES OR CONDUIT

POTABLE WATER

RECLAIMED WATER, IRRIGATION AND SLURRY LINES

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

57/ Information contained in this appendix approved by the CGA Board on September 24, 2004.
BEST PRACTICES CHAPTER 5—EXCAVATION

Practice Statement 5–19: Excavation Tolerance Zone:
The excavator observes a tolerance zone that is comprised of the width of the facility plus 18 in. 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 a tolerance zone of more than 18 in.

Tolerance Zone
The following examples are of tolerance zones for a 1 in. and 12 in. line:

Be Aware!
Missouri statute 319.015 #1 defines the “Approximate Location” as a strip of land not wider than the width of the underground facility, plus two feet (24”) on either side.
BEST PRACTICES CHAPTER 5—EXCAVATION

Practice Statement 5–2: White Lining: 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.

Guidelines for Excavation Delineation

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 using 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 in. to 12 in. long and 1 in. wide with interval spacing approximately 4 ft to 50 ft apart.

Reduce the separation of excavation marks to a length that can reasonably be seen by the operator’s locators when the terrain at an excavation site warrants. Dots of approximately 1 in. diameter typically are 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

The single stake defines the proposed center of the excavation site. The radius of the excavation site is to be clearly indicated on the stake.

This circle illustrates the radius indicated on the stake.

Single stake with radius noted.

When an excavation site is contained within a 50 ft 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 white in color and displays the 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.

Trenching, Boring, or Other Continuous-Type Excavations

Continuous Excavation Marking

Mark in white paint the proposed centerline of planned excavation using 6 in. to 12 in. × 1 in. arrows approximately 4 ft to 50 ft apart to show direction of excavation. Reduce the separation of excavation marks to a length that can
reasonably be seen by the operator’s locators when the terrain at an excavation site warrants. 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.

**Stake, Flag, or Whisker Excavation Markers**

![Stake, Flag, or Whisker Excavation Markers](image)

Delineate the proposed area of excavation using stakes, flags, or whiskers instead of spray paint to mark radius or arcs; the four corners of the project; or when outlining the excavation project. Limit the interval spacing to approximately 4 ft to 50 ft. Reduce the separation of excavation marks to a length that can reasonably be seen by the operator’s locators when the terrain at an excavation site warrants.

Stakes, flags, or whiskers provided to illustrate arcs or radii may be placed at closer intervals to define the arc or radius. Stakes, flags, or whiskers are white in color and display the excavator’s company identifier (name, abbreviations, or initials).
BEST PRACTICES CHAPTER 4
LOCATING AND MARKING

Practice Statement 4–3: Color Code: A uniform color code and set of marking symbols is adopted nationwide.

Guidelines for Operator’s Facility Field Delineation
Operator markings of facilities include the following:

- The appropriate color for their facility type
- Their company identifier (name, initials, or abbreviation) when other companies are using the same color
- The total number of facilities and the width of each facility
- 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 approximately 12 in. to 18 in. long and 1 in. wide, spaced approximately 4 ft to 50 ft apart. When marking facilities, the operator considers the type of facility being located, the terrain of the land, the type of excavation being done, and the method required to adequately mark the facilities for the excavator.

- 12” to 18”
- 4’ to 50’ in distance
- 1” Wide
2. The following marking examples illustrate 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.
   1) placing the marks over the approximate center of the facility:

   ![Single Facility Marking](image1)

   Approximate Center of Facilities

   2) 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:

   ![Single Facility Marking](image2)

   Approximate Outside Edge of Facilities

These examples indicate an operator’s 12 in. facility. When a facility can be located or toned separately from other facilities of the same type, it is marked as a single facility.\textsuperscript{62/}
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.

**Example:** four plastic facilities that are 4 in. in diameter (4/4” PLA)

![Diagram of multiple facility marking]

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.

**Example:** four plastic conduits that are 4 in. in diameter (4/4” PLA), and the marks are 16 in. apart, indicating the actual left and right edges of the facilities

![Diagram of conduit marking]
D. Corridor Marking: Used to mark multiple facilities of the same type (e.g., electric), bundled or intertwined in the same trench, where the total number of facilities is not readily known (operator has no record on file for the number of facilities). 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.

**Example:** a 12 in. corridor (12” CDR)

3. Changes in direction and lateral connections are 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.

**Example:** radius
Example: lateral connection

Example: painted offset

Example: staked offset
4. An operator’s identifier (name, abbreviation, or initials) is placed at the beginning and at the end of the proposed work. In addition, subsequent operators using the same color mark their company identifier at all points where their facility crosses another operator’s facility using the same color. Reduce the separation of excavation marks to a length that can reasonably be seen by the operator’s locators when the terrain at an excavation site warrants.

**Examples:**

<table>
<thead>
<tr>
<th>CITYCO</th>
<th>ELECO</th>
<th>TELCO</th>
</tr>
</thead>
</table>

5. Information regarding the size and composition of the facility is marked at an appropriate frequency.

**Examples:**

- the number of ducts in a multi-duct structure, width of a pipeline, and whether it is steel, plastic, cable, etc.

<table>
<thead>
<tr>
<th>TELCO</th>
<th>GASCO</th>
<th>WATERCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/4” CAB</td>
<td>4” PLA</td>
<td>12” STL</td>
</tr>
</tbody>
</table>

6. Facilities installed in a casing are identified as such.

**Examples:**

- 6 in. plastic in 12 in. steel and fiber optic in 4 in. steel.

<table>
<thead>
<tr>
<th>GASCO</th>
<th>TELCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” PLA/12” STL</td>
<td>FO (4” STL)</td>
</tr>
</tbody>
</table>
7. Structures such as vaults, inlets, and lift stations that are physically larger than obvious surface indications are marked so as to define the parameters of the structure.

Example:

![Diagram of a vault marked as ELECO Vault](image)

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

![Diagram of DE marker](image)

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., TELCO) mark the area “NO” followed by the appropriate company identifier in the matching APWA color code for that facility.
  
  Example: NO TELCO

- Operators of multiple facilities 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 for which there is “No Conflict.”

  Example: NO GASCO/G/D illustrates that GASCO has no gas distribution facilities at this excavation site. The following abbreviations are used when appropriate: /G/D (gas distribution); /G/T (gas transmission); /E/D (electric distribution); /E/T (electric transmission).
• 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 indicate on the flag which facilities are in “No Conflict” with the excavation (see the previous example).

• If it can be determined through maps or records that the proposed excavation is obviously not in conflict with their facility, the locator or operator of the facility may notify the excavator of “No Conflict” by phone, fax, or e-mail, or through the one call center, where electronic positive response is used. Operators of multiple facilities indicate a “No Conflict” for each facility (see 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 e-mail 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 verifying 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.

**Example:**

```
NO CITYCO/W
NO TELCO
NO GASCO/G/D/T
NO ELECO
```

Work Area

Delineation

---

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### Common Abbreviations

#### Facility Identifier

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH</td>
<td>Chemical</td>
</tr>
<tr>
<td>E</td>
<td>Electric</td>
</tr>
<tr>
<td>FO</td>
<td>Fiber Optic</td>
</tr>
<tr>
<td>G</td>
<td>Gas</td>
</tr>
<tr>
<td>LPG</td>
<td>Liquefied Petroleum Gas</td>
</tr>
<tr>
<td>PP</td>
<td>Petroleum Products</td>
</tr>
<tr>
<td>RR</td>
<td>Railroad Signal</td>
</tr>
<tr>
<td>S</td>
<td>Sewer</td>
</tr>
<tr>
<td>SD</td>
<td>Storm Drain</td>
</tr>
<tr>
<td>SS</td>
<td>Storm Sewer</td>
</tr>
<tr>
<td>SL</td>
<td>Street Lighting</td>
</tr>
<tr>
<td>STM</td>
<td>Steam</td>
</tr>
<tr>
<td>SP</td>
<td>Slurry System</td>
</tr>
<tr>
<td>TEL</td>
<td>Telephone</td>
</tr>
<tr>
<td>TS</td>
<td>Traffic Signal</td>
</tr>
<tr>
<td>TV</td>
<td>Television</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
</tr>
<tr>
<td>W</td>
<td>Reclaimed Water “Purple”</td>
</tr>
</tbody>
</table>

#### Underground Construction Descriptions

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Conduit</td>
</tr>
<tr>
<td>CDR</td>
<td>Corridor</td>
</tr>
<tr>
<td>D</td>
<td>Distribution Facility</td>
</tr>
<tr>
<td>DB</td>
<td>Direct Buried</td>
</tr>
<tr>
<td>DE</td>
<td>Dead End</td>
</tr>
<tr>
<td>JT</td>
<td>Joint Trench</td>
</tr>
<tr>
<td>HP</td>
<td>High Pressure</td>
</tr>
<tr>
<td>HH</td>
<td>Hand Hole</td>
</tr>
<tr>
<td>MH</td>
<td>Manhole</td>
</tr>
<tr>
<td>PB</td>
<td>Pull Box</td>
</tr>
<tr>
<td>R</td>
<td>Radius</td>
</tr>
<tr>
<td>STR</td>
<td>Structure (vaults, junction boxes, inlets, lift stations)</td>
</tr>
<tr>
<td>T</td>
<td>Transmission Facility</td>
</tr>
</tbody>
</table>

#### Infrastructure Material

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Acrylonitrile - Butadiene - Styrene</td>
</tr>
<tr>
<td>ACP</td>
<td>Asbestos Cement Pipe</td>
</tr>
<tr>
<td>CI</td>
<td>Cast Iron</td>
</tr>
<tr>
<td>CMC</td>
<td>Cement Mortar Coated</td>
</tr>
<tr>
<td>CML</td>
<td>Cement Mortar Lined</td>
</tr>
<tr>
<td>CPP</td>
<td>Corrugated Plastic Pipe</td>
</tr>
<tr>
<td>CMP</td>
<td>Corrugated Metal Pipe</td>
</tr>
<tr>
<td>CU</td>
<td>Copper</td>
</tr>
<tr>
<td>CWD</td>
<td>Creosote Wood Duct</td>
</tr>
<tr>
<td>HDPE</td>
<td>High Density Polyethylene</td>
</tr>
<tr>
<td>MTD</td>
<td>Multiple Tile Duct</td>
</tr>
<tr>
<td>MTD</td>
<td>Multiple Tile Duct</td>
</tr>
<tr>
<td>PLA</td>
<td>Plastic (conduit or pipe)</td>
</tr>
<tr>
<td>RCB</td>
<td>Reinforced Concrete Box</td>
</tr>
<tr>
<td>RCP</td>
<td>Reinforced Concrete Pipe</td>
</tr>
<tr>
<td>RF</td>
<td>Reinforced Fiberglass</td>
</tr>
<tr>
<td>SCCP</td>
<td>Steel Cylinder Concrete Pipe</td>
</tr>
<tr>
<td>STL</td>
<td>Steel</td>
</tr>
<tr>
<td>VCP</td>
<td>Vertrified Clay Pipe</td>
</tr>
</tbody>
</table>
Guide for Abbreviation Use

Follow these guidelines when placing abbreviations in the field:

• Place the Company Identifier 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

**Example:** TELCO/TEL/FO/PLA indicates that TELCO 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 omit one or more of the abbreviation types, use the order described above but omit the slash and abbreviation that does not apply.

**Example:** to omit /TEL), the result would be TELCO/FO/PLA.
Color Code Identifiers

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SEWERS AND DRAIN LINES
Damage Prevention and Safety Presentations Available

MOCS has four Damage Prevention Managers who will be happy to work with you to schedule a presentation for your company's employees.

If you need a presentation for a safety or educational meeting, contact us at 573-635-1818 to schedule a date and time.
Working Together to Prevent Damage!

For additional information, visit our website: mo1call.com