

**Recommended Marking Guidelines
For Underground Utilities**

**FINDINGS OF THE MARKING GUIDELINES SUB-COMMITTEE
OF THE APWA ONE-CALL COMMITTEE**

Michael McDonald, Chair
August 9, 2001

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Recommended Marking Guidelines For Underground Utilities

Background

Why are the Guidelines for marking underground facilities needed? The American Public Works Association took the lead in the development of the color codes for the identification of underground-buried facilities that have been adopted throughout the United States and many other countries. Currently throughout the nation and the world for that matter, the placement and replacement of underground facilities thrives.

The challenges faced by excavators are enormous enough on top of the fact that they must deal with different legislative requirements from different municipalities and states. As a result of this drive to place more and more of our infrastructure underground, a large number of contractors are crossing both local and state boundaries.

At the heart of damage prevention is improved information accuracy and consistency in communication between excavators and operators of underground facilities.

Discussion

Because of these issues, One Call Systems International attempted to create Marking Guidelines in the early 90's. This effort failed however because no stakeholder could reach agreement, and there was no common ground.

The Transportation Equity Act for the 21st Century (TEA 21), and the high visibility damages to underground facilities that lead up to it changed all this.

Because of this Bill, the Department of Transportation responded to the request for Best Practices relating to damage prevention.

These best practices covered everything from the design of a project to the completion and mapping of underground installations as well as emerging technologies.

Membership of the APWA took a lead on this effort and through the relationships built through this process it was agreed that the time was right to move forward with these guidelines.

These proposed guidelines are not all inclusive, nor with emerging technologies, should anything we propose be.

Methodology

The process we adopted is as follows:

First, make sure that there was accurate representation from all stakeholders as well as support from APWA staff. Our Stake holders represented the following organizations and Trade Associations; American Gas Association, Edison Electrical Institute, the National Telecommunications Damage Prevention Council, One Call Systems International, the National Utility Contractors Association, the AGC, the National Utility Locating Contractors Association (NULCA), Locate Equipment Manufacturers Association, as well as input from the info-now community due to the web posting.

There were nine responses from the recommendations posting on the web. Several comments expressed concerns relating to the marking of no/conflict, or all clear of facilities. Actually this was an oversight by the committee before the posting of the guidelines on the web and the following changes have been made: If a no conflict exists at the excavation site instead of "GAS/OK", a marking

should be placed indicating at a minimum the initials of the underground facility owner. Example: NO/PG&E, or a circle with a / through it accompanied by the owners initials. It was also suggested that the company segment be identified as well. As stated in a response from AT&T, "Numerous government organizations who have expanded their public works departments and utility units from typical water, sewer, street, and drain operators into power, telephone, cable TV, ISP, and other telecommunications carriers."

Finally, there has been a great deal of concern raised about the amount of paint placed on the ground. This was a concern of the committee as well, however of a higher concern was that of Public Safety and the reliability of the nations' underground infrastructure.

All responses and comments from this posting have been compiled as well as my responses and are included as appendices.

The process for all decisions was based on obtaining consensus of all parties. Everything you see within this proposal are suggested guidelines that all participants could live with and agreed upon. Many issues still exist that we could not reach agreement on, however it is the committee's feeling that this indeed is a step in the right direction.

Marking Guidelines Sub-Committee Members

Mike McDonald, Chair – American Public Works Association (APWA)
Gary McKay – Detroit Edison
Tim Boatfield – Georgia Utility Protection Center
Jim Barron – National Utility Contractors Association (NUCA)
Allen Gray – Associated General Contractors of America (AGC)
Jacque Washburn – 3M Corporation
Tom Jackson – Georgia Power
Morgan Abele – National Utility Locating Contractors Association (NULCA)
Ron Boes – American Gas Association (AGA)
Danny Barret – National Telecommunication Damage Prevention Council (NTDPC)
Dan Simpson – WorldCom
Bill Kieger – Pennsylvania One-Call

Recommendations

We respectfully ask the Board to adopt the following Resolution endorsing the Recommended Marking Guidelines in conjunction with the current Color Codes.

Respectfully Submitted by the Marking Guidelines Sub Committee,

Michael McDonald, Chair

Appendix A -- Recommended Marking Guidelines for Underground Utilities

The APWA Marking Recommendations Committee

The APWA Marking Recommendations Committee was organized and operated under guidelines similar to those used by the Common Ground: Best Practices committees.

- Anyone on the committee could propose or recommend existing marking practices.
 - Only those practices receiving a consensus of all committee members were included in the final recommendations.
 - The committee felt that the original name for the committee: "APWA Marking Standards Committee" be changed to the "APWA Marking Recommendations Committee", this change was agreed to by all committee members. Henceforth, all proposals from the committee will be referred to as *recommendations* versus *standards*.
1. "Utility lines will be indicated by markings using current APWA color codes. Markings should be 18"-24" in length and 2" in width."
 2. "The owner of a facility should be indicated by initials or by name in letters 6" high at the beginning and end of the locate. On long locates the facility owner should be indicated every 100'."
 3. "When known, the total number of lines within the ground will be indicated." The number of lines indicated should be based on the physical lines "that you could place your hands on". Multiple cables twisted together to form a single facility, as in the case of electric lines, would be considered one cable for locate purposes.
 4. "If a facility is known to be present but the total number of lines for a facility cannot be determined a corridor marker may be used. The corridor marker should indicate the approximate width of the facility." A marking resembling the letter "H" lying on its side will indicate the corridor marker.
 5. "When known, the size of the line being located will be indicated. Line size will indicate the outside diameter of the pipe or structure. The oversized utility marking should indicate the approximate size of pipe or structure." A mark resembling the letter "H" lying on its side, bisected by line extending along its length will indicate the oversized utility marking. The committee discussions centered on indicating sizes of single physical structures such as gas lines, sewer lines, water lines, and storm drains.
 6. "Duct structures, whether a single duct or multiple ducts, will be indicated by duct symbol indicating the approximate width of the duct structure." The duct

marker will be indicated by a marking resembling a diamond bracketed by two parallel lines. The committee did not state whether indicating size should extend to indicating size of duct structures (telecommunications, electric) or indicating pair count for telephone lines.

7. **“When known, the pressure of a gas facility will be indicated.”** Gas pressure will be indicated as either low pressure, intermediate high pressure or high pressure. The committee did not determine whether gas pressure would be indicated in instances of high pressure only or for all pressures. The committee did not determine whether the type of pipe should be indicated (plastic, steel, cast iron, etc.).
8. **“When known, termination points, dead ends and stub outs should be indicated.”** The committee reviewed NULCA’s recommendation, which resembles the letter “T” with drop downs.
9. **“When there is a strong likelihood that marks may be destroyed offsets should be used.”** Offsets are indicated on a permanent surface and are placed parallel to the running line of the facility. The offset should indicate the distance from the offset to the facility and should identify the facility owner and if necessary size of the facility.

The following issues were discussed but either a consensus could not be reached or further discussion was considered necessary:

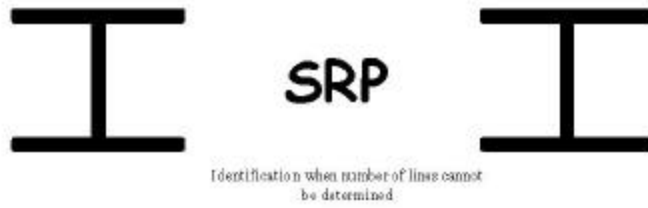
1. How does a locator indicate that access could not be gained to a yard or location and the locate request could not be completed. This is usually due to locked fences, dogs or other physical obstructions. The committee felt that a marking standard for this issue would not be developed. Suggestions that would be acceptable included the use of door hangers (indicating that the locator needed access to the property) and/or telephone calls to the requestor.
2. How and when do we indicate the presence of buried, abandoned facilities. Excavators felt that the utilities should indicate ALL facilities in the ground regardless of status. Utility records often do not indicate the presence of abandoned facilities. Access may not be available to abandoned facilities or those facilities may not be capable of being located. An additional issue is whether the abandoned facility should be identified as abandoned.
3. How to indicate the presence of electronic markers (EM’s).
4. How to indicate the presence of buried splices, valves and manholes.

The following are samples on how the above suggestions would look:

Line Markings



Corridor Markings



Oversized Utility Markings



Conduit Markings



Marking Gas Lines – High Pressure



Marking Termination Point, Dead End, Stub Outs



Marking Offsets



Indicate – Facility owner, direction to utility and distance to facility.

No Conflict (No utilities within the requested area)

NO/MCI **NO/EPG**

Proposed Markings – Consensus not reached by committee

Electronic Marker

EM

Marking Buried Splices, Valves, Manholes



Appendix B – Responses to Comments Received

Response to Larry Ferguson:

Larry the committee agrees totally. Your recommendation will be part of the report delivered to the APWA Board of Directors for approval. Thank you again for taking the time.

-----Original Message-----

From: Ferguson, Larry D [mailto:Larry.D.Ferguson@Williams.com]
Sent: Friday, June 22, 2001 9:17 PM
To: Teresa Hon
Cc: Haberkorn, Michael A
Subject: Suggestion to showing no gas in area

I work for Williams Gas Pipeline and we are in the same areas as local Distribution companies -- In the past we had a real problem with the Local gas company marking no gas -- but guess what Williams had a high Pressure main 3 feet away. It is imperative that the company Logo or Initials be placed in the locate marks to show which company has no Facility in the area.

Response to Dan Munthe:

Dan-Thanks for your response. I will respond in the order received.

(Line Markings)

The premise of arrows at the ends of the requested area makes good sense, however the committee could not reach consensus on a standard or recommendation as to how far apart marks should be based off of variables with field conditions.

(Corridor Markings)

Even though this has the potential for abuse, this was a compromise reached between the facility owners and the nations two largest Contractor Associations, the A.G.C., and the National Utility Contractor Association. These marks are to be used when the material, size and number of facilities are not known.

(High Pressure)

No consensus could be reached on acronyms other than High Pressure. This was partly due to no conflict symbology. It was agreed that any no conflict or site clear indication should include the initials of the company without facilities in the dig area. This could lead to more confusion than currently exists.

(Marking Offsets)

If every underground facility, road or permanent surface ran north to south or east to west, this would be a viable option.

(Marking Buried Splices, Valves, and Manholes)

The proposed guidelines are all the Committee could reach consensus on.

(What was not addressed)

1. White Markings: No consensus could be reached due to varied local legislation and whether this should be required on small jobs.

2. Addressed with corridor marking

3. Addressed with corridor marking

4. No consensus could be reached

5. No consensus could be reached

6. No consensus could be reached along with magnetic tape

-----Original Message-----

From: Munthe, Dan [mailto:Dan.Munthe@state.mn.us]

Sent: Tuesday, August 21, 2001 12:12 PM

To: 'Mike McDonald'; Teresa Hon

Subject: RE: Proposed marking guidelines

Some random thoughts in no particular order...

"Line Markings"

Arrows should be used only at the ends of the requested area (as indicated on the one call ticket). This would indicate that the facility continues (of course).

"Corridor Markings"

This could potentially be abused, i.e. if two facilities shared a 10' easement could a locate technician then paint a 10' corridor marking across the whole easement?

"High Pressure"

H.P.= High Pressure. It would be beneficial to develop a standardized list of acronyms for other situations as well...

COM = Communications

ELC = Electric

STL = Steel

EMS = Electronic Marking System device

CON = Concrete and etc.

"Marking Offsets"

direction (N,S,E,and W) should be included.

"No Conflict"

Should only be used with an informational flag (translucent in color) that

identifies the facility owner and included locate ticket information so that the flag can not be displaced and used elsewhere.

"Marking Buried Splices, Valves, and Manholes"
Should be differentiation between buried splices and valves and vaults.

Also, these standards do not address...

1. White Markings
2. Size indications (anything over 2" diameter).
3. Material indications (steel, plastic, clay tile, etc.)
4. Spacing of the marks
5. Flags (standardization; owner & phone number?) and frequency of use.
6. Alternative markings; stake chasers

Thanks,
Dan Munthe
Minnesota Office of Pipeline Safety
651-296-7364

Response to Robert Davis:

Thank you for your support Mr. Davis. The reason for "Recommended Marking Guidelines" verses "Marking Standards" is as follows. Emerging technologies for our industry is changing the way we do business at a rapid pace. I can remember going on jobsites with my father watching him locate underground facilities with witching rods. Today I go to jobsites and see demonstrations of the latest generations of Ground Penetrating Radar. Our hope is that these guidelines if adopted by the APWA Board be liquid and easily modified verses an ANSI standard.

-----Original Message-----

From: Robert H. Davis [mailto:rhdservices@mindspring.com]
Sent: Thursday, August 09, 2001 5:58 AM
To: Teresa Hon
Cc: Tim Boatfield; Hans Wonneberger
Subject: Marking Guidelines Feedback

I cannot offer any specific input at this time, only a strong interest. I just became aware of this effort from Tim Boatfield (GAUPC).

My firm is in the private locating business, locating not only on private property, but often in the right-of-way. We have been encountering many more types of

facilities than there are official APWA designations over the years. Obviously my technicians "made up" markings. It has become more of a problem as we have more technicians and surveyors that we work with and need to standardize.

I think your work in this area is important. However, I am not clear as to why you want to change from developing standards to only "recommended" markings.

Bob Davis

RHD Services, Inc.
630 10th Street, N.W.
Atlanta, Ga. 30318
404-634-6152
Fax 404-874-8586

Response to Patricia Koeb:

***Patricia, thank you for your response.
Your comments regarding "no conflict" or "site clear" have been addressed in the following manner.
Because in many situations there could theoretically be two companies in the same area of excavation, i.e.: Missouri Gas and Williams Co. High pressure, this marking guideline will be recommended.
N/MGE or N/WILLIAMS or N/WGP (whatever initials the facility owner determines).
Because of utilities initialing their facilities the committee could not come to a consensus on the use of any other acronyms other than High pressure.***

-----Original Message-----

From: Patricia Koeb [mailto:patricia.koeb@southernunionco.com]
Sent: Wednesday, August 08, 2001 1:36 PM
To: Teresa Hon
Cc: Melvin Burns
Subject: Feedback concerning Proposed Marking Guidelines

Missouri Gas Energy
Engineering Department
223 Gillis
Kansas City, MO. 64120

8 August 2001

To whom it may concern:

Regarding the APWA June 6th, 2001 proposed utility marking guideline, Missouri Gas Energy would like to comment on 2 separate markings:

No Conflict (No utilities within the requested area)
GAS/OK

MGE personnel think that: GAS & (circle with / thru it) may be more appropriate or possibly just no marking; if that utility is not in the area.

Marking Gas Lines - High Pressure
- could also be Plastic - PE or Cast Iron - CI

Your attention to these suggestions are appreciated! For further questions, please contact: Patricia Koeb at 816-472-3485 or Melvin Burns at 816-472-3464.

Sincerely,

Patricia Koeb

Response to Gary Auvil:

Gary- the committee agrees with your issue regarding no conflict, site clear, and the potential for disastrous results. Your recommendation and comments have been incorporated into the final report for the APWA Board of Directors.

As with you a large concern for the industry is the issue of over marking. A great deal of discussion and compromise took place between the contractors associations as well as the owners of underground facilities. Your concerns on this matter will be addressed in the report as well. Thank you again for your participation.

-----Original Message-----

From: Auvil, Gary [mailto:Auvil.Gary@broadband.att.com]
Sent: Tuesday, August 07, 2001 1:47 PM
To: Teresa Hon
Subject: Marking Guidelines Feedback

As a representative of a multi business / multi facility company, I see potential problems with the "clear area - no utility" marking proposal. If, for example, AT&T were to mark an area "No TEL" it might imply to Excavators that there were no

telephone lines to worry about, while Sprint, MCI WorldCom, and other local telephone companies may have facilities in the area. Additionally, many companies now operate separate and distinct businesses that have been merged together under one name, with segment identifiers. AT&T for instance, has AT&T Long Distance (designated "LD") and AT&T Broadband (designated "BB"). I am also aware of numerous local government organizations who have expanded their public works departments and utility units from typical water, sewer, street, and drain operators into power, telephone, cable TV, ISP, and other telecommunications carriers.

All marks should identify the company or entity, and further identify by company segment. Tickets generated by the local One Call entity will list the member companies, giving the excavator names of companies and segments or departments to look for.

Finally, any methods or standards developed should attempt to minimize The amount of marks required and mandate spray chalk or other products that Will dissipate, or can easily be removed or covered after work is complete. Left over marks are becoming deceptive and a form of eye pollution!

Gary Auvil
Director - New Construction
San Francisco Bay Market
550 Garcia Avenue
Pittsburg, CA. 94565
925.432.0500 ext. 225
925.382.7443 Wireless
925.439.9537 Fax
auvil.gary@broadband.att.com

Response to Bill Phillips:

Bill, thank you for your response.

I understand your preference for generic facility identification however damage to underground facilities and public safety require more.

I will use NO/GAS as an example:

A gas distribution company in the mid-west marked a N/G on the ground indicating no conflict for gas at the job site. A cable TV construction crew arrived on the job prior to the due date of the marking request, saw the N/G on the ground and dug into a high pressure gas line that had not arrived to mark yet.

This same scenario has applied to many companies; AT&T, Sprint, MCI, El Paso Natural Gas etc.

The proposed marking guidelines were developed jointly between facility owners and the nations two largest Contractor Associations, the AGC, and National Utility Contractors Association.

The only recommendations to be made to the APWA Board of Directors will be those that consensus could be reached upon.

Thank you again for your comments.

-----Original Message-----

From: Phillips, Bill [mailto:bphillip@czn.com]

Sent: Tuesday, August 07, 2001 10:47 AM

To: Teresa Hon

Cc: Farrow, Mike

Subject: Marking Guidelines Feedback

This is some feed back from the field

I only care that the facilities are marked so that the contractor understands. I prefer generic facility designations such as TEL OK for notification of no conflicts. Most contractors don't know who the local Company is. This may be a problem for multiple CATV vendors, but they usually are in common trenches anyway.

Bill Phillips

Operations Supervisor

PSC West

916-686-3032

916-686-9528 fax

Response to Bruce Bocking:

Bruce thanks you for your remarks and your concerns. I will attempt to address them in the order received. Please keep in mind these recommendations were reached by consensus and anything that could not be agreed to was not included.

1. Corridor Markings were developed for the excavating community based on a need to know how many facilities may be within a given trench. The committee agrees that this may not be warranted for most Gas Companies however; it is very necessary for Electric and Communication distribution companies. In many states the definition of what a facility actually is not spelled out in the legislation. Many underground maps of older installations as well may not show the number of facilities. Excessive paint is a concern of all, however public safety is of greater concern.

2. Your comments relating to no conflict are right on target and have been adopted for the Boards approval.

3. At the national level there is a great need in both the Electric and Communications industries. Electronic Markers are used for the following: service stub-outs, junction boxes, conduit stub outs, and with emerging technologies data warehousing of facility installation and maintenance information. The committee could not reach consensus on this issue as stated in the guidelines.

These recommendations are just that, recommendations. They are a start and with the rapid changes underway with our industry currently, will surely change, as new technology is made available.

Thank you again for taking the time and effort to participate.

-----Original Message-----

From: Bocking, Bruce - TPBXB [mailto:tpbxb@socalgas.com]
Sent: Tuesday, August 07, 2001 8:44 AM
To: thon@apwa.net
Cc: Hammer, Steve B. - TPSBH
Subject: Proposed Markings

I wanted to take this opportunity to comment on the proposed APWA Markings displayed on your web site <http://www.apwa.net/HotTopics/#14>
<<http://www.apwa.net/HotTopics/>>

#1) I feel the proposed "corridor" markings are excessive and not warranted. If a facility owner marks up the street with that much paint the cities will demand their removal.

#2) The "No Conflict" suggestions are ambiguous. GAS/OK could mean no natural gas line in conflict but there could be a gasoline line existing or vice versa. What if one member fails to show up? I would suggest "NO SCG" for no Southern California Gas in conflict. Or "NO Shell", etc..

#3) Marks For electronic markers and buried splices are not appropriate under Suggested marking guidelines. Those marks mean nothing to an excavator and just add to the national excessive street marking problem. Thanks for the opportunity to comment.

Bruce Bocking
Southern California Gas Co.
E&TS - Field Technologies
Bbocking@socalgas.com
213-244-4290

Response to Richard Lonn:

***Richard thank you for your input and concerns.
The committee expressed many of the concerns you have remarked about during our discussions. As a facility owner knows, maps are not always correct.
Because of this, it was the committee's recommendation that size, material, number of facilities, etc., only be specified, "When Known".
The corridor marking was a compromise between the nations two largest Contractors Associations, the AGC, and the National Utility Contractors Association. They were the ones who really pushed this issue. The bottom line is that if there is ANY DOUBT, this information should not be given.
These Marking Recommendations are a start, and will undoubtedly change, as new technology is made available.
Thank you again for taking the time to respond.***

-----Original Message-----

From: Richard Lonn [mailto:rlonn@aglresources.com]
Sent: Tuesday, July 24, 2001 4:54 AM
To: Teresa Hon
Cc: Colleen Heflin; Terry McCready; TBoatfield@gaupc.com;
tvjackson@southernco.com
Subject: Marking Guidelines Feedback

Dear folks,

These comments are concerning the proposed APWA marking guidelines. Overall, there are several good suggestions in the sample sheet. These include:

Utility Initials	Corridor markings
Conduit Markings	Termination Points
Marking offsets	the symbology for
Oversized Utilities	

However, I have one concern that relates to several of the examples, and that is to request the locator to mark the size, pressure and material of gas lines with the symbology. To ask the locator to determine whether the line they are locating is 6", 4" or 2" and plastic, steel or cast iron when he may not have records available on site could result in significant misinformation and mismarkings where you have mixed systems with multiple material and size changes within a small area.

This is a particularly difficult situation for utilities who cannot take electronic records into the field. The other issue of indicating

pressure is even more difficult to ensure and provides no benefit to the excavator that I can see. A damaged gas line is dangerous regardless of whether it has a 1/4 psi, 60 psi or 300 psi pressure on it.

As I said earlier, overall, I think most of the recommendations have merit, but the reasons for not providing information on size, material and pressure are important and not different at all from the reasons that locators do not provide depth either.

Thanks for allowing this input.

Sincerely,

Richard R. Lonn
Chief Engineer
AGL Resources

Response to Don Heyer:

Don thanks for participating and taking the time to send your comments.

My response will be based and formatted in the order of your comments and those of USA North.

I will start by saying that these are recommendations and not standards. As far as the question of who should come up with these recommendations, my understanding was that this was voted on by the membership of One Call Systems International who charged the committee with the task of moving forward. This effort also falls into line with the APWA color codes, which has been adopted internationally.

APWA took the same approach as the common ground best practices for these recommendations, and that was one of consensus.

Please keep in mind that you represent three states and their stakeholders. APWA represents stakeholders in all 50 states as well as other countries.

As a point of clarification, these recommendations were not limited to only the owners and operators of underground facilities. The committee had participation from all stakeholders including representation from the National Utility Contractors Association as well as the A.G.C. (Both of these are the premier Contractor Associations in the United States)

Graffiti as you stated is a major issue for Municipalities throughout the United States, however Public Safety is far more important to Risk Managers. Again please keep in mind these are recommendations and not standards. This is an education issue and needs to be promoted as such.

Based off of your remarks and those received by others, the no conflict symbol will be changed to include the initials of the facility owner. Your point is well taken that it is ambiguous and could lead to disastrous results.

While we agree that these recommendations are not all inclusive, they are recommendations that every participant can agree upon. As was found on the Common Ground Best Practices Study, it is almost impossible to arrive at solutions that satisfy the requirements of all state and local legislation. The same challenges held true for the color codes. Through education, and the continuing partnerships with other Trade Organizations, and our participation with the Common Ground Alliance, we feel this effort is just the beginning of heightened public awareness and public safety as a whole.

-----Original Message-----

From: Don Heyer [mailto:dheyer@usan.org]
Sent: Monday, June 25, 2001 4:00 PM
To: Teresa Hon
Subject: Comments on Marking Recommendationns Committee

APWA

To Whom It May Concern:

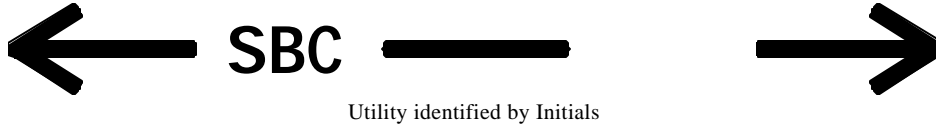
My comments are in blue for your convenience, verses the recommendations in black made by the APWA Marking Recommendations Committee. There are several issues with the recommendations of the APWA Marking Recommendations Committee that my organization, USA North and our members in Central / Northern California, Nevada and Hawaii have.

1. Even though the APWA has been an outstanding asset of Damage Prevention and will continue to be, I feel that the Common Ground Alliance (CGA) Best Practices Subcommittee would be a more appropriate organization to make any recommendation for new marking standards. The recommendations would be new standards and their adoption would fall under Chapter 4 Locating and Marking Task Team Best Practices. The CGA Best Practices Subcommittee is in charge of modification, additions or deletions to the Best Practices of the Common Ground Report. Since the CGA is made-up of all stakeholders including the APWA, it would certainly be more appropriation organization to review recommendation for marking standards.

2. These recommendations only deal with one half of the issue. They are limited to owner/operators of underground facilities and have no recommendations for the excavators. This leaves a great void between the two groups, if Damage Prevention is a shared responsibility where are the recommendations for the excavator as some States have already adopted. In the three states that my One-Call Center serves, we have had Suggested Marking Guidelines for both the excavator and the owner/operator for 5 years plus, why have our and other One-Call Centers guidelines and been ignored?
3. One of the greatest out cries that the Cities and Counties of California, Hawaii and Nevada has is Graffiti. Approximately 4 years ago the Cities and Counties of California tried to past a bill, that would outlaw the use of spray can paint. If it had pasted, how would the owner/operators of underground facilities have marked the horizontal path of their facilities? One of the major reasons that this bill was defeated was an agreement between stakeholders (especially these cities and counties) that our marking guidelines would be used to educate both excavator and owner/operator to limit the over-marking of excavation sites. The white markings from excavators indicating the limits of their job site is a crucial part of this undertaking, and the cooperation of the owner/operation to limit their marking to the area indicated by the excavators white markings. These recommendations also increase the size of marking by the owner operator to a point where I believe the Cities and Counties of California will try to eliminate spray can paint again.
4. Please review the OVERSIZED UTILITY MARKINGS, CONDUIT MARKINGS AND MARKING GAS LINES – HIGH PRESSURE marking below, these markings create what is called graffiti in the streets. These marking could be replaced by Example “A” and provide the same appropriate information.
5. Please review the NO CONFLICT (NO UTILITIES WITHIN THE REQUESTED AREA) this marking is ambiguous. What is it saying to the excavator? By substituting the NO CONFLICT with Example “E” you clearly indicate which utility has no facility at this site. The use of generic markings is strongly discouraged, it confuses all stakeholders at the job site. Is the NO CONFLICT marking, clearing all gas lines at this excavation site? It sure seems to be indicating that there are no gas lines at this site.

The following are samples on how the above suggestions would look (All markings would correspond to current APWA color code standards:

Line Markings

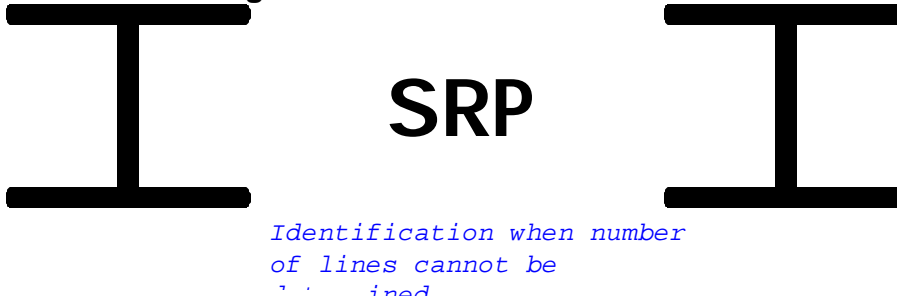


Example A:



Our marking example uses less marking paint without arrow points and allows for width or number of facilities to be displayed which helps the excavator. Use of arrows is limited to providing direction of offsets

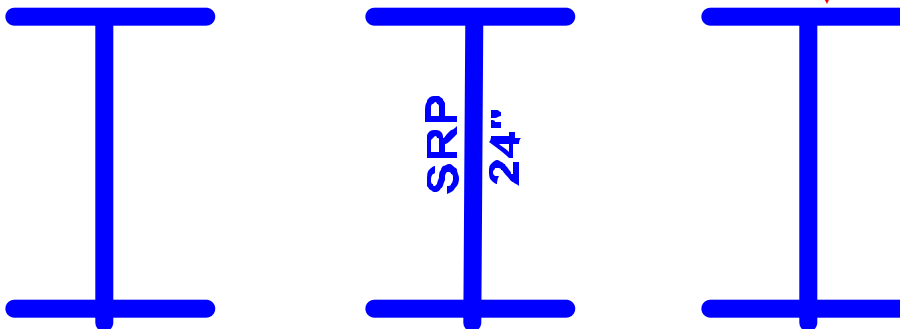
Corridor Markings



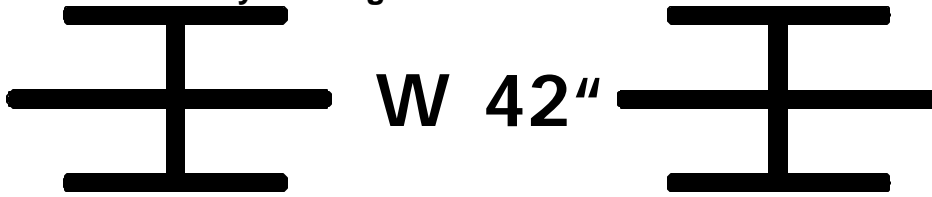
Example B:



Either of the markings above or below use less marking paint and allows for the width or number of facilities to be displayed. These markings represent the centerline of the facility or the facility and the hand dig buffer. CA & NY hand dig buffer is 24" while NY buffer is 30"



Oversized Utility Markings



Markings for large diameter structures

This type of marking is excessive and unnecessary, examples A & B take width into consideration, no matter how wide or narrow.

Conduit Markings



Conduit can be marked just like any other type of facility by using examples A & B and adding the number of ducts or the width of the duct structure, this

Marking Gas Lines – High Pressure

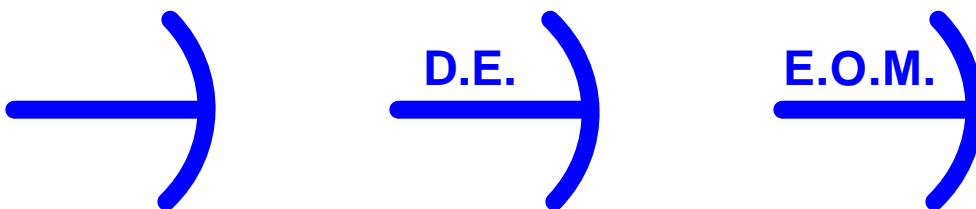


Providing the pressure of a gas facility is not necessary, it could cause an excavator to think that a lower pressure is safer to use power equipment around and it creates unnecessary liability for the pipeline companies (what if they get the pressure wrong. Use of arrows is limited to providing direction of effects on labels only.

Marking Termination Point, Dead End, Stub Outs



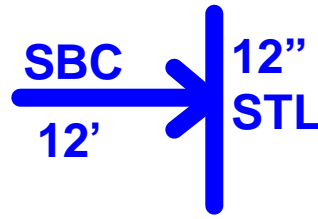
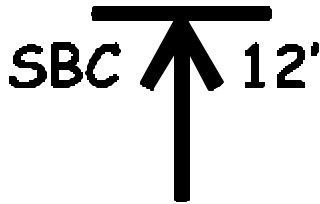
Example C:



This is how we mark the termination points; either the marking without letters or with D.E. (Dead End) or E.O. M. (End of Main), width of line can

Example D:

Marking Offsets



*Indicate - Facility
owner, direction to
utility and distance to*

The above is our example of our offset markings. We suggest that the arrow points the direction to the line, which includes the initials of the utility, and the distance to the line. The width and composition of the line is marked on the other side for clarification. Use of arrows is limited to

Proposed Markings – Consensus not reached by committee

No Conflict (No utilities within the requested area)

GAS/OK

No PG&E

or **~~PG&E~~**

Example E:

The use of generic description of facilities is strongly discouraged because of liability. By saying NO or a circle with a slash through it with the company initials clearly indicates that this utility has no

Electronic Marker

EM

Is this an industry standard marking?

Marking Buried Splices, Valves, Manholes



Establishing guidelines for these types of structures is unnecessary, the centerline marking or and hand dig buffer covers this type of facility.

Thanks,
Don Heyer, Operations Manager
USA North
dheyer@usan.org
925-798-9504 ext 4

[Appendix C – Request for Comments Posted on the Internet](http://www.apwa.net/About/PET/One-Call/index.asp?mode=marking)
(<http://www.apwa.net/About/PET/One-Call/index.asp?mode=marking>)

APWA Marking Recommendations Committee

Years ago when utility companies, excavators, and utility locators were based in a single city or region everyone essentially 'knew' what the color codes and markings standards were for their local utilities systems. Today, utility companies are national and global entities; excavator's work and travel across many different regions of the country, and utility locating firms have contracts for multiple customers over much of the country. What is common practice in one region is completely foreign in another. Excavators and utility locators must often 'learn' a new set up markings with each area they work. This has lead to a good deal of confusion and frustration of behalf of the various stakeholders in the damage prevention process.

Members of the APWA and other associations related to the damage prevention industry recognized the need for a uniform set of marking standards for the utility industry. While the APWA color code is the universally accepted standard for identifying utility types, there has not been a universally accepted recommendation for the methods of marking and identifying utility lines. The intent and hope of the APWA Marking Standard Committee is to present some basic guidelines for developing and establishing uniform marking standards for utility lines.

Cases in point:

- There are at least 20 known methods for indicating a buried duct structure
- There are at least 18 known methods for indicating a single buried facility.
- It is not unusual to see completely different methods of marking the same type of utility line or structure in the same city or region. This is often the case with different utility owners of the same utility type providing service in the same areas.

It was with these problems and ideas in hand that the first committee assembled. The first meeting of the APWA Marking Standards Committee took place on February 29, 2000 at the Underground Safety 2000 Show in Las Vegas, Nevada.

In attendance were:

- Mike McDonald – APWA
- Gary McKay – Detroit Edison
- Tim Boatfield – Georgia Utility Protection Center
- Jim Barron – National Utility Contractors Association (NUCA)
- Allen Gray – AGC
- Jacque Washburn – 3M Corporation
- Tom Jackson – Georgia Power
- Morgan Abele – National Utility Locating Contractors Association (NULCA)

The 2000 APWA Symposium in Phoenix, Arizona was the second meeting of the APWA Marking Standards Committee. The first two meetings where then followed by a series of conference calls to help clarify the position of the APWA Marking Standards Committee.

Additional participants in these meetings were:

- Danny Barret – AT&T
- Dan Simpson – MCI
- Ron Boes – AGA
- Don Heyer – USA North
- Bill Kieger – OCSI

Some key issues for the committee:

- Change APWA Marking Standards to APWA Marking Recommendations. The committee felt that the APWA should provide recommendations and guidance as opposed to setting any sort of required standard.
- Include a broad range of stakeholders, along the lines of the Common Ground: Best Practices Committees.
- Establish a consensus forum, also along the lines of the Common Ground: Best Practices Committees. Only those recommendations reaching full consensus from the committee members would be included as a recommendation.

Where do we see these recommendations proceeding?

After review and comments from the other PET committees, as well as comments from the general membership based off of the Web posting, a compilation of the proposed guidelines and all comments will be presented to the APWA Board of Directors for approval.

Again thanks to the staff and membership of the following Trade Groups and Associations for all their hard work on this project and to those whose names inadvertently may not have been included in this document.

National Utility Contactors Association
Associated General Contractors of America
American Gas Association
Edison Electrical Institute
Equipment Manufacturers Association
National Telecommunications Damage Prevention Council
Office of Pipeline Safety

Submitted Respectfully, Michael K. McDonald Committee Chair

Proposed Marking Guidelines

- Proposed Marking Symbols rev June 2000 [PDF](#)

Provide Input Regarding the Proposed Marking Guidelines (Please submit no later than August 15, 2001) e-mail input to: thon@apwa.net

AMERICAN PUBLIC WORKS ASSOCIATION
1401 K Street, NW 11th Floor, Washington, DC 20005 Tel: (202) 408-9541 Fax: (202)
408-9542

APWA Resolution

ENCOURAGING THE USE OF
"RECOMMENDED MARKING GUIDELINES FOR UNDERGROUND UTILITIES"

Recommended by the One-Call Committee: August 10, 2001
Approved by the Government Affairs Committee: September 10, 2001
Adopted by the Board of Directors: September 12, 2001

WHEREAS, the American Public Works Association (APWA) has been a leader in the movement to protect underground utilities through the establishment of the Uniform Color Code for designating the various utilities, which has become a national standard, and

WHEREAS, the number and complexity of underground utilities has dramatically increased, largely due to the adoption of the Telecommunications Act of 1996 in the United States, but also a phenomenon occurring globally, and

WHEREAS, the Transportation Equity Act for the 21st Century (TEA 21) provided monies for exploring best practices for protecting underground utilities, which has raised the expectations in the construction, utility, and right-of-way management professions, and

WHEREAS, the One-Call Professional/Educational/Technical Committee of APWA and their networking community, One-Call Systems International (OCSI) formed a sub-committee to propose marking guidelines to assist in delineating the various utility owners and size of buried utility infrastructure, and

WHEREAS, the Marking Guidelines sub-committee has developed proposed marking guidelines and have circulated them to APWA members, including contractors, public and private utility owners, one-call center operators, utility marking contractors, public right-of-way managers, and

WHEREAS, the One-Call Professional/Educational/Technical Committee of APWA has developed "Recommended Marking Guidelines for Underground Utilities" in a report dated August 9, 2001, and

WHEREAS, the One-Call Committee approved the Recommended Marking Guidelines and have asked the APWA Board of Directors to recommend these guidelines be used by all utilities and public agencies, now therefore

BE IT RESOLVED, by the American Public Works Association as follows:

The Board of Directors of the American Public Works Association encourages all utility owners and public agencies to use the recommended guidelines set forth in

“Recommended Marking Guidelines for Underground Utilities,” dated August 9, 2001,
and

Furthermore, it is recommended that the various One-Call Centers (sometimes referred to as Call Before You Dig systems) adopt the recommended guidelines for use in their respective service area, and

Furthermore, that a copy of this resolution be widely distributed to APWA members; affiliated professional and trade associations; and appropriate state and federal agencies.