BEST PRACTICES

Version 2.0

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CGA™

Common Ground Alliance

Whether you are a facility owner/operator, locator, design professional, one-call center employee, excavator/contractor or other stakeholder, ensuring the safety of those who work or live in the vicinity of underground facilities and protecting our vital services is everyone's responsibility.

The Common Ground Alliance (CGA) is a nonprofit organization dedicated to the promotion of shared responsibility and implementation of the "best practices" in damage prevention. In 1999, the U.S. Department of Transportation sponsored the Common Ground Study of One Call Systems and Damage Prevention Best Practices. Following the completion of the Study, the Common Ground Alliance was developed to build on the spirit of shared responsibility.

The mission of the CGA is to ensure public safety, environmental protection, and integration of services by promoting effective damage prevention practices. The Alliance works cooperatively to enhance underground damage prevention by:

- Fostering a sense of shared responsibility for the protection of underground facilities;
- Identifying and disseminating the stakeholder best practices such as those embodied in the Common Ground Study;
- Developing and conducting public awareness and education programs;
- Promoting Federal grants for damage prevention;
- Supporting research; and,
- Serving as a clearinghouse for damage data collection, analysis, and dissemination.

For additional information on the Common Ground Alliance or to learn how to become a member, visit the CGA web site at www.commongroundalliance.com.

Introduction

Common Ground Study of One Call Systems and Damage Prevention Best Practices

The purpose of the Common Ground Study, completed in 1999, was to identify and validate existing best practices performed in connection with preventing damage to underground facilities. The collected best practices were intended to be shared among stakeholders involved with and dependent upon the safe and reliable operation, maintenance, construction, and protection of underground facilities. The best practices contain validated experiences gained that can be further examined and evaluated for possible consideration and incorporation into state and private stakeholder underground facility damage prevention programs.

Best Practices Version 2.0

The Common Ground Alliance (CGA) was created to further the work begun by the Common Ground Task Force established by the United States Department of Transportation (DOT) in 1998. The Task Force's work product, entitled the "Common Ground Study," provided a guide to underground utility damage prevention best practices in use throughout the United States.

CGA's Board of Directors instructed the Best Practices Committee to develop a CGA Best Practices Guide based upon the work of the Task Force. The Best Practices Committee developed the following guide that includes: Part 1 Section A, a verbatim restatement of the best practices listed in the Study; Part 1 section B, includes the practice statement with supporting description; and the Appendix that consists of a glossary of terms and definitions. The verbatim restatement of all of the ancillary material contained in the original Study, other than the best practices themselves, is available on the CGA web site and is intended as an historical reference point for those persons interested in a more detailed background regarding the current best practices.

Neither DOT nor the CGA ever intended that the best practices described in 1999 would constitute a static model. Rather, both anticipated that the best practices would evolve over time as more was learned and as technology advanced. Moreover, CGA and the DOT expected that there likely would be additional best practices developed by the interested participants. Version 2.0 should be viewed as a starting point. As best practices are added or amended, the additions and amendments will be reflected in further versions, numbered sequentially. By this means we hope to provide a continuum that will permit the public, and especially stakeholders in underground utility damage prevention, to see the course of development over time. We also hope to provide commentary as to the reasons for any indicated changes.

Comments and suggestions on improving the format are welcome. Our intent is to make the statement of these best practices as easy to use as possible. If we can improve upon what you see here in order to do so, your input in helping us do so would be most appreciated. To propose a new practice or practice modification, contact the CGA office (703-836-1709) to request a proposal form or visit the CGA web site at www.commongroundalliance.com.

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Project owners and facility owners/operators regularly communicate and coordinate with each other concerning future and current projects.

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The presence and type of underground facilities are indicated by permanent above and below ground markers and material.

2-6: Follow Applicable Codes, Statutes & Facility Owner/Operator Standards
When planning and designing the installation of new or replacements of existing underground facilities, the designer follows all federal, state and local guidelines, codes, statutes and other facility owner operator standards.

2-7: Use of Qualified Contractors
Qualified contractors are used to excavate on and near underground facilities.

2-8: Mandatory Pre-Bid Conferences
A mandatory pre-bid conference is held and bids are only accepted from attending contractors.

2-9: Continuous Interface During Bid and Prebid
Once a project design is completed, the designer participates in the pre-bid/bid process.

2-10: Continuous Interface During Construction
The designer continues to interface with the selected contractor throughout the construction phase.

2-11: As-Built Drawings
As-built drawings are prepared and the information recorded to aid future excavations and locates.

2-12: Supply Line Separation
When installing new direct buried supply facilities in a common trench, a minimum of 12 inch radial separation should be maintained between supply facilities such as steam lines, plastic gas line, other fuel lines, and direct buried electrical supply lines. If 12 inches separation cannot be feasibly attained at the time of installation, then mitigating measures should be taken to protect lines against damage that might result from proximity to other structures. Examples may include the use of insulators, casing, shields or spacers. If there is a conflict among any of the applicable regulations or standards regarding minimum separation, the most stringent should be applied.[1]

One-Call Center Practices

3-1: Pro-active Public Awareness, Education and Damage Prevention Activities
The one-call center has a documented, pro-active public awareness, education, and damage prevention program.

3-2: Specifically Defined Geopolitical Service Area with No Overlap

1 TR-2001-04: Amendment Approved by CGA Board on September 25, 2003

The one-call center(s) serving a specifically defined geopolitical area is (are) structured so that an excavator need only make one call, and a facility owner/operator need only belong to a single one-call center.

3-3: Formal Agreements with Members
Each member of the one-call center abides by state statute where applicable or written agreement that states the rights and the responsibilities of the one-call members and the one-call center.

3-4: One-Call Center Governance
The one-call center is governed by a board of directors representing the diverse makeup of the constituent groups, for example facility owners/operators, designers, contractors/excavators, and government.

3-5: Single Toll Free Statewide Number with Nationwide Access
The one-call center(s) have a single toll free statewide number with nationwide access.

3-6: Hours of Operation
The one-call center can process locate requests 24 hours a day, 7 days per week.

3-7: Voice Record of All Incoming Calls
A voice recording is maintained of all voice transactions concerning requests to locate facilities.

3-8: Retention of Voice Records According to Applicable Statutes
Voice records of all calls concerning requests to locate facilities are kept in retention according to applicable statutes.

3-9: Caller Feedback
The one-call center provides the caller with the ticket number and the names of facility owners/operators who will be notified for each locate request.

3-10: Printed Ticket Recall
The one-call center can provide a printed copy of any ticket for a period of time determined by applicable statutes.

3-11: Documented Operating Procedures, Policies, and Manuals
The one-call center has documented operating procedures, human resource policies and training manuals.

3-12: Documented Owner Verification of Data Submitted by Facility Owners
The one-call center returns the geographic description data base documentation to the facility owner/operator annually and after each change for verification and approval.

3-13: Flexibility for Growth and Change
The operating plan of the one-call center is sufficiently flexible to accommodate growth and change.

3-14: Meeting Between the Excavator and Facility Operator(s)
The one-call center has a process for receiving and transmitting requests for meetings between the excavator and the facility operator(s) for the purpose of discussing locating facilities on large or complex jobs.

3-15: One-Call Center Accepts Notifications from Designers
The one-call center accepts design requests and has the ability to process them as designated by the facility owners/operators.

3-16: Locate Request
The one-call center captures the following information, at a minimum, on a locate request: the caller's name and phone number; the excavator's/company's name, address and phone numbers; the specific location of the excavation; the start date and time of the excavation; and the description of the excavation activity.

3-17: Practices to Reduce Over-Notifications
The one-call center employs practices designed specifically to reduce the number of notices transmitted to facility owners/operators, in which the reported excavation site is outside the owner's/operator's desired area of notification.

3-18: Disaster Recovery
A one-call center develops, implements, and maintains an effective disaster recovery plan enabling the one-call function to continue in the event of a disaster.

3-19: Remote User Interface
The one-call center provides users a means of direct, electronic entry of locate requests that maintains comparable ticket quality to an operator-assisted entry.

3-20: Accept Multiple Reference Points for Locate Requests
The one-call center is able to accept multiple types of points of reference to define the exact location of an excavation site (i.e., latitude/longitude, highway/railroad/pipeline mile markers, address, street and cross-street, etc.).

3-21: One-Call Center Security
The one-call center provides appropriate physical and systems security, fire protection and electrical protection to protect the one-call center and its critical components.

3-22: Hardware Designed to Tolerate a Single Point of Failure
The one-call center uses fault tolerant hardware for its critical path operations, such as ticket taking, database access, and ticket delivery.

3-23: One-Call Quality Standards
The one-call center establishes performance standards for the operation of the center for the purpose of promoting accuracy, cost effectiveness and efficiency.

Locating & Marking Practices

4-1: Locators utilize available facility records at all times.
Facility locators use available records at all times.

4-2: Awareness of Errors or Omissions
If a facility locator becomes aware of an error or omission, then the facility locator provides information for updating records that are in error or to add new facilities.

4-3: Uniform Color Code and Set of Marking Symbols
A uniform color code and set of marking symbols is adopted nation wide. **(See Appendix B for Additional Practice Information)**

4-4: Single Locator for Multiple Facilities
A single locator is used for multiple facilities.

4-5: Training and Documentation
Locators are properly trained. Locator training is documented.

4-6: Safe Locates
Locates are performed safely.

4-7: Visual Inspection
A visual inspection is completed during the facility locating process.

4-8: Adequate Marks
Facilities are adequately marked for conditions.

4-9: Positive Response
Positive response is provided to facility locate requests.

4-10: Multiple Facilities in the Same Trench
Multiple facilities in the same trench are marked individually and with corridor markers.

4-11: Information on Abandoned Facilities
Information on abandoned facilities is provided when possible.

4-12: Electro-Magnetically, Active/Conductive Locating
When locating electro-magnetically, active/conductive locating is preferable to passive/inductive locating.

4-13: Identification of Facility Owner/Operator
The facility owner/operator is identified.

4-14: Communication
Communication is established between all parties.

4-15: Documentation is Maintained
Documentation of work performed on a locate is maintained.

4-16: Damaged Facility Is Investigated as Soon as Possible
A damaged facility is investigated as soon as possible after occurrence of damage.

4-17: Forecasting/Planning for Predictable Workload Fluctuations
Forecasting/Planning for Predictable Workload Fluctuations. A plan is developed for dealing with unpredictable fluctuations.

4-18: Locating Quality Assurance Program
Underground facility owners/operators have a Quality Assurance program in place for monitoring the locating and marking of facilities.[2]

Excavation Practices

5-1: One-Call Facility Locate Request
The excavator requests the location of underground facilities at each site by notifying the facility owner/operator through the one-call system. Unless otherwise specified in state law, the excavator calls the one-call center at least two working days and no more than ten working days prior to beginning excavation.

5-2: White Lining
When the excavation site can not be clearly and adequately identified on the locate ticket, the excavator designates the route and/or area to be excavated using white pre-marking prior to the arrival of the locator. **(See Appendix B for Additional Practice Information)**

5-3: Locate Reference Number
The excavator receives and maintains a reference number from the one-call center that verifies the locate was requested.

5-4: Pre-Excavation Meeting
When practical, the excavator requests a meeting with the facility locator at the job site prior to the actual marking of facility locations. Such pre-job meetings are important for major, or unusual, excavations.

5-5: Facility Relocations
The excavator coordinates work which requires temporary or permanent interruption of a facility owner/operator's service with the affected facility owner/operator in all cases.

5-6: Separate Locate Requests
Every excavator on the job has a separate one-call reference number before excavating.

5-7: One-Call Access (24x7)
The excavator has access to a one-call center 24 hours per day, 7 days a week.

5-8: Positive Response
The excavator is notified by the underground facility owner/operator of the tolerance zone of the underground facility by marking, flagging, or other acceptable methods at the work site, or is notified that a no conflict situation exists. This takes place after notification from the one-call center to the underground facility owner/operator and within the time specified by state law.

5-9: Facility Owner/Operator Failure to Respond
If the facility owner/operator fails to respond to the excavator's timely request for a locate (e.g., within the time specified by state requirements) or if the facility owner/operator notifies the excavator that the underground facility cannot be marked within the time frame and a mutually agreeable date for marking cannot be arrived at, the excavator re-calls the one-call center. However, this does not preclude the excavator from going on with the project. The excavator may proceed with excavation at the end of two working days, unless otherwise specified in state law, provided the excavator exercises due care in his endeavors.

5-10: Locate Verification
Prior to excavation, excavators verify they are at the correct location and verify locate markings and, to the best of their ability, check for unmarked facilities.

5-11: Documentation of Marks
An excavator uses dated pictures, videos, or sketches with distance from markings to fixed objects recorded, to document the actual placement of markings.

2 TR-2003-02: Amendment Approved by CGA Board on March 26, 2004

5-12: Work Site Review with Company Personnel
Prior to starting work, the excavator reviews the location of underground facilities with site personnel.

5-13: One-Call Reference Number at Site
The excavator's designated competent person at each job site has the one-call ticket number.

5-14: Contact Names and Numbers
The excavator's designated competent person at each job site has access to the names and phone numbers of all facility owner/operator contacts and the one-call center.

5-15: Facility Avoidance
The excavator uses reasonable care to avoid damaging underground facilities. The excavator plans the excavation so as to avoid damage or minimize interference with the underground facilities in or near the work area.

5-16: Federal and State Regulations
The excavator adheres to all applicable federal and state safety regulations, which includes training as it relates to the protection of underground facilities.

5-17: Marking Preservation
The excavator protects and preserves the staking, marking, or other designations for underground facilities until no longer required for proper and safe excavation. The excavator stops excavating and notifies the one-call center for re-marks if any facility mark isremoved or no longer visible.

5-18: Excavation Observer
The excavator has an observer to assist the equipment operator when operating excavation equipment around known underground facilities.

5-19: Excavation Tolerance Zone
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 requirements that currently specify more than 18".

5-20: Excavation within Tolerance Zone
When excavation is to take place within the specified tolerance zone, the excavator exercises such reasonable care as may be necessary for the protection of any underground facility in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include: hand digging when practical (pot holing), soft digging, vacuum excavation methods, pneumatic hand tools, other mechanical methods with the approval of the facility owner/operator, or other technical methods that may be developed. Hand digging and non-invasive methods are not required for pavement removal.

5-21: Mis-Marked Facilities
The excavator notifies the facility owner/operator directly or through the one-call system if an underground facility is not found where one has been marked or if an unmarked underground facility is found. Following this notification, the excavator may continue work if the excavation can be performed without damaging the facility, unless specified otherwise in state law.

5-22: Exposed Facility Protection
Excavators support and protect exposed underground facilities from damage.

5-23: Locate Request Updates
The excavator calls the one-call center to refresh the ticket when excavation continues past the life of the ticket (sometimes, but not always, defined by state law). This recognizes that it is a best practice to define ticket life. If not currently defined in state law, ticket life would best be 10 working days but not to exceed 20 working days.

5-24: Facility Damage Notification
An excavator discovering or causing damage to underground facilities notifies the facility owner/operator and the one-call center.

All breaks, leaks, nicks, dents, gouges, groves, or other damages to facility lines, conduits, coatings or cathodic protection will be reported.

5-25: Notification of Emergency Personnel

If the damage results in the escape of any flammable, toxic, or corrosive gas or liquid or endangers life, health, or property, the excavator responsible immediately notifies 911 and the facility owner/operator.[3] The excavator takes reasonable measures to protect themselves and those in immediate danger, general public, property, and the environment until the facility owner/operator or emergency responders have arrived and completed their assessment.[4]

5-26: Emergency Excavation

In the case of an emergency excavation, maintenance or repairs may be made immediately provided that the excavator notifies the one-call center and facility owner/operator as soon as reasonably possible. This includes situations that involve danger to life, health or property, or that require immediate correction in order to continue the operation of or to assure the continuity of public utility service or public transportation.

5-27: Backfilling

The excavator protects all facilities from damage when backfilling an excavation. Trash, debris, coiled wire, or other material that could damage existing facilities or interfere with the accuracy of future locates are not to be buried in the excavation.

5-28: As-Built Documentation

Contractors installing underground facilities notify the facility owner/operator if the actual placement is different from expected placement.

Mapping Practices

A decision was made by the Mapping Team to look at mapping practices from the viewpoint of the different areas represented by the Team members. Therefore, the best practices for mapping are listed in five distinct areas: One-Call Center, Locator, Excavator, Facility Owner/Operator, and Project Owner. By consensus of the Mapping Task Team, all of the findings listed below are best practices.

One-Call Center

1. The land base should be accurate.
2. The land base and database uses latitude/longitude.
3. The land base is up-to-date.
4. The database is updated by information from facility owners/operators.
5. The electronic mapping system can produce a ticket for the smallest practical geographical area.
6. The land base is available to the public.

Locator

7. Locators are trained in map reading and symbology.
8. The locator provides precise facility location to the facility owner operator when there is a discrepancy.
9. The locator supplies feedback to the one-call center.

Excavator

10. The excavator provides accurate location information to the one-call center.
11. The excavator provides basic attributes to the one-call center.

[3] TR-2001-02A: Amendment Approved by CGA Board on November 30, 2001
[4] TR-2001-02B: Amendment Approved by CGA Board on September 27, 2002

Facility Owner/Operator

12. The facility owner/operator provides mapping data to the one-call center.
13. The facility owner/operator provides mapping data access.
14. Mapping standards are adhered to.
15. Consistent, current information is provided to the one-call center.
16. Detailed mapping information is collected.

Project Owner

17. The project owner provides accurate information.
18. The project owner determines basic coordinates.

Compliance Practices

7-1: Public and Enforcement Education
Public education programs are used to promote compliance. Mandatory education is considered as an alternative or supplement to penalties for offenders of the damage prevention laws and regulations.

7-2: Incentives
Damage prevention programs include incentives to promote compliance with laws and regulations.

7-3: Penalties
Compliance programs include penalties for violations of the damage prevention laws or regulations.

7-4: Damage Recovery
State damage prevention laws and regulations recognize the right to recover damages and costs resulting from non-compliance.

7-5: Enforcement
An authority is specified through state statutes and given the resources to enforce the law. A structured review process is used to impartially adjudicate alleged violations.

Public Education Practices

8-1: Use of a Marketing Plan
An effective damage prevention education program includes a comprehensive, strategic marketing/advertising plan.

8-2: Target Audiences and Needs
An effective damage prevention education program includes identification of target audiences and their individual needs.

8-3: The Use of Structured Education Programs
An effective damage prevention education program is structured to accommodate the needs of individual audiences.

8-4: Target Mailings
An effective damage prevention education program communicates vital damage prevention, safety, and emergency response information to target audiences through periodic mailings.

8-5: The Use of Paid Advertising
An effective damage prevention education program includes paid advertising to increase damage prevention awareness and practices.

8-6: The Use of Free Media
An effective damage prevention education program utilizes all available free media.

8-7: The Use of Giveaways
An effective damage prevention education program uses promotional giveaway items to increase damage prevention awareness.

8-8: Establishing Strategic Relationships
An effective damage prevention education program establishes strategic relationships.

8-9: Measuring Public Education Success
An effective damage prevention education program includes structured annual or biennial (every two years) measurement(s) to gauge the success of the overall program.

Reporting & Evaluation

9-1: All Stakeholders Report Information
All stakeholders report information.
9-2: Standardized Information Is Reported
Standardized information is reported.
9-3: Identify Non-compliant Stakeholder
Identify the non-compliant stakeholder.
9-4: Detailed Information
Person reporting provides detailed information.
9-5: Requested Information May Change
Requested information may change.
9-6: Standardized Form
A standardized form is adapted.
9-7: Simple Form
The form is simple.
9-8: Training
Training is provided.
9-9: Flexibility
Flexibility on completing and returning form is provided.
9-10: One-Page Form
The form is one page.
9-11: Same Form Completed
Stakeholders complete the same form.
9-12: An Organization Is Identified to Receive the Information
An organization is identified to receive the information.
9-13: Interface
The organization is able to interface with all stakeholders.
9-14: Evaluation
An organization evaluates the data.
9-15: Representation
The organization has representation from all stakeholders.
9-16: Improve Damage Prevention Efforts
Data is used to improve damage prevention efforts.
9-17: Elevate Awareness
Data is used to elevate underground damage awareness.
9-18: Summarizing Data
Data is summarized by key components.
9-19: Root Causes
Root causes are identified.
9-20: Results are Quantified
Results are quantified against a standardized risk factor.
9-21: Performance Levels and Trends
Performance levels and trends are assessed.

Homeland Security and the Best Practices

Many of the recommended practices contained within the CGA's Best Practices Manual require the sharing of critical infrastructure information. This sharing is an important aspect of ensuring that parties involved with the identification of, the excavation around, and the general protection of underground facilities have adequate information to protect underground infrastructures. However, in the interest of Homeland Security, all parties must ensure that such information is only shared with individuals who truly require this critical information. To this end, parties who employ or contract with individuals that may have access to such information, should ensure that those individuals or contractors have the appropriate credentials to ensure that the information is not obtained by individuals or groups that may intend to damage, alter, or destroy the infrastructure in question.[5]

5 Addition Approved by Best Practices Committee on April 8, 2003.

Planning and Design Best Practices

2.6.1 Planning

1. PLAT DESIGNATION OF EXISTING UNDERGROUND FACILITY EASEMENTS

Practice Statement: Plats involving development of real property include the designation of underground facility easements.

Practice Description: Various items are required on the plats filed prior to the development of lands. Where plats are required to be filed, the items required include the identification of the easements of underground facilities traversing the land described on the plat. Identification of easements of underground facilities on the plat increases notice to developers and the public about the existence of the underground facilities. Notification to the owners of underground facilities that a plat has been filed alerts underground facility owners operators to establish communication between the developers and the operators to facilitate a plan and design for the use of the land which complements the underground facility.

Benefits: Often underground facility owners/operators do not receive notice of developments impacting their facilities until excavation activity has commenced. This compromises the optimal use of the land and potentially compromises the integrity of the underground facility.

Reference:

- St Louis County, Minnesota zoning ordinances.

2. GATHERING INFORMATION FOR DESIGN PURPOSES

Practice Statement: The designer uses all reasonable means of obtaining information about underground facilities in the area of the planned excavation.

Practice Description: During the planning phase of the project, all available information is gathered from facility owners/operators. This includes maps of existing, abandoned and out-of-service facilities, cathodic protection and grounding systems, as-builts of facilities in the area if the maps are not current, proposed project designs, and schedules of other work in the area. This information is gathered for the purpose of route selection and preliminary neighborhood im pacts, and as part of the process of impact analysis when evaluating different design possibilities. Methods of gathering information may include contacting a one-call center, facility owners/operators, coordinating committees/councils, other designers, engineering societies, and governmental agencies as a means of identifying underground facility owners/operators in an excavation area. Gathering information may also include a review of the site for above ground indications of underground facilities (i.e. permanent signs or markers, manhole covers, vent pipes, pad mounted devices, riser poles, power and communication pedestals and valve covers). The one-call center provides a listing of operators directly to the designer, or to the designer's subsurface utility engineer. This information is available in formats that are accessible to all users such as voice, fax, E-mail or web-site. Once identified, the designer contacts the operators directly or uses the one-call system. The facility owner/operator may locate their underground facilities or provide locations of their underground facilities to the designer by other means, such as by marking up design drawings or providing facility records to the designer.

Benefits: Gathering underground facility information and including this information in the planning phase minimizes the hazards, cost and work to produce the final project.

- Safety is enhanced.

- Unexpected conflicts with facilities are eliminated.
- Facility relocations are minimized.

References:

- Wisconsin Sec. 186.0175 Stats.
- Minnesota Statute 216D.
- Pennsylvania Act 287 of 1974, as amended by Act 187 of 1996.
- See related Finding Number 3, "Identifying Existing Facilities in Planning and Design."
- "Construction Management Interference Control Manual," Consolidated Edison, New York, New York, June 9, 1997.
- Subsurface Utility Engineering, Federal Highway Administration (FHWA), February 1999, Office of Program Administration (HIPA).
- Florida Department of Transportation Utility Accommodation Manual, Document No.: 710-020-001-d, Section 11.4, January 1999.

3. **IDENTIFYING EXISTING FACILITIES IN PLANNING AND DESIGN**

Practice Statement: Designers indicate existing underground facilities on drawings during planning and design.

Practice Description: During the planning phase of the project, existing facilities are shown on preliminary design plans. The planning documents include possible routes for the project together with known underground facility information. The various facility owners operators are then given the opportunity to provide appropriate feedback. During the design phase of the project, underground facility information from the planning phase is shown on the plans. If information was gathered from field located facilities, from underground facility surveys or from subsurface utility engineering, this is noted on the plans. The designer and the contractor both know the quality of the information included on the plans. If an elevation was determined during the information gathering, it is shown on the plan. The facilities shown include active, abandoned, out-of-service, and proposed facilities. The design plans include a summary drawing showing the proposed facility route or excavation including streets and a locally accepted coordinate system. The plans are then distributed to the various facility owners/operators to provide the opportunity to furnish additional information, clarify information, or identify conflicts.

Benefits: Providing complete underground facility information and including this information on design drawings reduces the hazards, simplifies coordination and minimizes the cost to produce the final project.

4. **UTILITY COORDINATION**

Practice Statement: Project owners and facility owners/operators regularly communicate and coordinate with each other concerning future and current projects.

Practice Description: Utility coordination fosters an open ex change of information among private and public facilities, govern mental agencies and construction related organizations. Utility coordination also promotes cooperation among said groups in the planning, design and construction of projects affecting the overall good of participating parties, their organizations and customers or constituents, and the general public. Utility Coordinating Committees (or Councils) include private utilities, public agency utilities, engineering firms, contractor associations, and others with facilities or business interests in public rights-of-way. Coordinating Committees function in multiple communities, counties and states to promote excavation project coordination. Typical items of discussion include facility excavations in existing and recently paved roadways, disruption of essential facility services, location of utility facilities, environ mental impact of damages to utilities, permit procedures, right-of way access controls and underground facility damage prevention. Plans of future roadway improvement and of future facility installations are reviewed regularly.

References:

- Wisconsin Administrative Rule Chapter Trans 220 "Utility Facilities Relocations."
- Arizona Utility Coordinating Committee (AUCC) Public Improvement/Project Guide, December 1996.
- Highway/Utility Guide (FHWA), Publication No. FHWA-SA-93-049; June 1993.

2.6.2 Design

5. MARKERS FOR UNDERGROUND FACILITIES

Practice Statement: The presence and type of underground facilities are indicated by permanent above and below ground markers and material.

Practice Description: A combination of above ground and below ground markers is used to identify and locate underground facilities. The purpose of above ground markers is to identify underground facilities, not to locate for excavation or circumvent the one-call process. However, designing underground facilities for future location reduces the risk of an incorrectly marked underground facility during an excavation project. Above ground markers are developed during the design process and include the company name, type of facility, emergency contact, and the one-call number. The locations and types of markers are specified in the construction plans. The design provides a marker system to include, but not limited to, stream crossings, public road crossings, other facilities' right-of ways, railroad crossings, heavy construction areas, and any other location where it is necessary to identify the underground facility location. If non-detectable facilities are being installed, the design includes a means to accurately locate the underground facility from the surface. The facility is color-coded in accordance with the APWA guidelines to assist in identifying the particular facility. Road decals, stencils, tracer tapes, electronic markers or other appropriate systems may mark areas where traditional markers are considered impractical.

Benefits: Provisions to aid in future locating requests are included in the design. In addition, an effective marker system is beneficial to the underground facility owner/operator and first responders to an area involving more than one underground facility or an incident near underground facilities.

References:

- 49 Code of Federal Regulations (CFR) Part 192 & 195.
- Industry Standards.
- APWA, "Guidelines for Uniform Temporary Marking of Underground Facilities."

6. FOLLOW ALL APPLICABLE CODES, STATUTES AND FACILITY OWNER/OPERATOR STANDARDS

Practice Statement: When planning and designing the installation of new or replacements of existing underground facilities, the designer follows all federal, state and local guidelines, codes, statutes and other facility owner/operator standards.

Practice Description: The designer of a facility project typically considers only national industry codes, regulations and practices applicable to that particular facility, and not of adjacent facilities. Regulations, codes, standards and other design documents generally specify depth of cover, and horizontal and vertical clearances between adjacent facilities. However, they are not always prescriptive and can be subject to interpretation by the designer. In addition, certain codes allow exceptions to the prescribed minimum clearances, contingent upon approval between the affected facility owners/operators. The designer also has to consider the protection and temporary support of adjacent facilities, and any interference to existing cathodic protection and grounding systems. Consequently, the designer has to provide specifications on safety measures to be taken and procedures for emergency notification and repairs in the case of any damage to an adjacent facility. Designers are aware of

proposed and revised standards and codes that may affect the project.

Benefits: The designer reviewing codes pertaining to adjacent facilities minimizes any potential conflict of code clearance requirements, and facilitates future locating efforts.

2.6.3 Pre-Bid/Bid

7. **USE OF QUALIFIED CONTRACTORS**

Practice Statement: Qualified contractors are used to excavate on and near underground facilities.

Practice Description: Contractors that excavate on and near underground facilities possess the qualifications necessary to conduct such activities in a manner that is skillful, safe and reliable. The requisite qualification of the contractor serves to protect the public and integrity of underground facilities in the vicinity of the excavation. Using qualified contractors ensures that all contractors who bid and work on a project employ safe work habits and are capable of performing the requested work. When working with contractors, the project owner is familiar with the contractors' work experiences and financial abilities and should not ask the contractors to bid beyond their capabilities. Allowing a competitive bidding process from qualified and competent contractors will assure the best quality and pricing available, while reducing damages to underground facilities.

Benefits:

- Enhances safety,
- The quality of work increases, and
- Damage to facilities decreases.

References:

- Florida Law (Chapter 337.14 FS.) And Rules of the State of Florida, Department of Transportation, Chapter 14-22.
- Duke Energy of Houston, TX, procedures.

8. **MANDATORY PRE-BID CONFERENCES**

Practice Statement: A mandatory pre-bid conference is held and bids are only accepted from attending contractors.

Practice Description: Depending on the level of impact of proposed construction upon facilities in the excavation area, the project owner or project designer requires potential contractors to attend a mandatory pre-bid conference including underground facility owners/operators. This pre-bid conference is exercised to discuss, among other things, the particular facilities in the area and the requirements to properly protect, support, and safely maintain the facilities during excavation. Official minutes are taken and disseminated as written to all attendees.

Benefits: Pre-bid conferences provide a forum for the contractor, owner and other interested parties to discuss a project and record binding changes or clarifications to the scope of the project. The pre bid conference also provides an opportunity for all parties to review contract documents, regulatory requirements, schedules and submittal formats. Most large projects involve multiple levels of subcontracting activity, as well as multi-layered regulatory oversight. The pre-bid conferences traditionally address these issues in an open forum so that all bidders are equally aware of the ground rules. The ground rules would be both commercial and technical in nature, covering the spectrum from performance bonds to safety practices.

References:

- Industry and governmental practices.
- Florida Department of Transportation.
- Duke Energy of Houston, TX, procedures.

9. **CONTINUOUS INTERFACE BETWEEN THE DESIGNER AND POTENTIAL CONTRACTORS DURING THE PRE-BID/BID PHASE**

Practice Statement: Once a project design is completed, the designer participates in the pre-bid/bid process.

Practice Description: The designer's continuing involvement during the pre-bid/bid phase with the potential contractor(s) allows for more effective communications between all parties. The designer

can assess whether the interested bidders have the expertise needed and the correct understanding of the intended design.

Benefits:

- By providing quality assurance, this practice minimizes potential safety concerns and delays to project completion.
- The designer would have the opportunity to relay information not readily shown on the plans, such as accommodations of facility adjustments required to construct the project.

References:

- Industry Practice.
- Expert Opinion.

2.6.4 Construction/Post-Construction

10. CONTINUOUS INTERFACE BETWEEN THE DESIGNER AND THE CONTRACTOR DURING THE CONSTRUCTION PHASE

Practice Statement: The designer continues to interface with the selected contractor throughout the construction phase.

Practice Description: This practice allows the designer to be available for pre-construction conferences, unforeseen conditions and design changes and post-construction conferences.

Benefits:

- Potential safety concerns are resolved more quickly, thereby minimizing subsequent modifications to the project design, costs and completion.
- The designer's inspections of the project during different stages are also facilitated.

Reference:

- Industry and government practice.

11. AS-BUILT DRAWINGS

Practice Statement: As-built drawings are prepared and the information recorded to aid future excavations and locates.

Practice Description: Installation should be made in accordance with the approved construction plans; any deviation to the plans is documented and such changes indicated on the as-built drawings. As-built information is recorded, retained and made available for subsequent excavation.

Benefits: As-built drawings serve as an information source for future projects to minimize damage to existing facilities.

References:

- Union Pacific Railroad procedures.
- Expert opinion.
- Industry and governmental practices.

12. SUPPLY LINE SEPARATION

When installing new direct buried supply facilities in a common trench, a minimum or 12 inch radial separation should be maintained between supply facilities such as steam lines, plastic gas lines, other fuel lines, and direct buried electrical supply lines. If 12 inches separation cannot be feasibly attained a the time of installation, then mitigating measures should be taken to protect lines against damage that might result from proximity to other structures. Examples may include the used of insulators, casing, shields or spacers. If there is a conflict among any of the applicable regulations or standards regarding minimum separation, the most stringent should be applied.[6]

References:

- National Electrical Safety Code CD-2002 (2002 Edition).
- Industry practices.

[6] TR-2001-04: Amendment Approved by CGA Board on September 25, 2003

For additional information on the Common Ground Alliance or to learn how to become a member, visit the CGA web site at www.commongroundalliance.com.

One-Call Center Best Practices

1. **PRO-ACTIVE PUBLIC AWARENESS, EDUCATION AND DAMAGE PREVENTION ACTIVITIES**

   Practice Statement: The one-call center has a documented, pro active public awareness, education, and damage prevention program.

   Practice Description: The one-call center seeks opportunities to promote the need to "Call Before You Dig," to enhance awareness of responsibilities to safeguard workers and the public and protect the integrity of the buried infrastructure, to foster a cooperative approach between the owners of buried facilities and the digging community toward the prevention of damage to buried facilities and to promote the service it provides.

   Typical Call Center activities include: promotional items; media advertising; participation at safety meetings; seminars and trade shows; contractor awareness programs; distribution of education material describing how the one-call system works; maintaining a database of active members of the local digging community; mediating and rationalizing the expectations of both the facility owners/operators and the digging community; and participation in local damage prevention or facility location and coordination committees.

   References:
   - One Call Systems International (OCSI) Voluntary Recognition Program.
   - Existing operating practices from various states' one-call centers.
   - One-Call Systems International Directory.
   - 49CFR Part 192.
   - 49CFR Part 198.
   - NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

2. **SPECIFICALLY DEFINED GEOPOLITICAL SERVICE AREA WITH NO OVERLAP**

   Practice Statement: The one-call center(s) serving a specifically defined geopolitical area is (are) structured so that an excavator need only make one call, and a facility owner/operator need only belong to a single one-call center.

   Practice Description: One-call programs are designed to promote ease of use for members (facility owners/operators) and for excavators. While this ease of use is enhanced when a one-call center serves a specifically defined geopolitical area that does not coincide with the service area of another one-call center, it is not essential. There are three requirements a one-call program meets in order to be considered as having implemented this best practice:
   - The program permits an excavator to use a single point of contact to submit and follow up on a notice of intent to excavate and notify affected facility owners/operators.
   - The program permits a facility owner/operator to join a single one call center and receive all appropriate notices.
   - The program is designed so that all pertinent information is shared among one-call centers in the event more than one exists.

   References:
   - One Call Systems International (OCSI) Voluntary Recognition Program.
   - Existing operating practices from various states' one-call centers.
   - NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

3. **FORMAL AGREEMENTS WITH MEMBERS**

   Practice Statement: Each member of the one-call center abides by state statute where applicable or written agreement that states the rights and the responsibilities of the one-call members and the one-call center.

   Practice Description: Operating procedures and bylaws are established. Procedures for the operation of a one-call center are simple. The concept is for service, not paperwork. Topics for procedures can be classified as: general, communications, center

operations, reports, expenses and publicity. These topics could be expanded to include guidelines and whatever else is needed for a particular system. Bylaws vary, depending on the type of organization. In some instances they may prove unnecessary. If bylaws are adopted, simplicity is the key word. Items that could be incorporated include sections on membership (including rights), financial matters, meetings, elections and duties of officers. Any other agreements required are kept as simple as possible to facilitate understanding by all participants. Consideration is given to include "hold harmless" clauses, amounts of liability insurance, errors and omissions insurance, retention of records, cost allocations, reimbursements, area served (with options to expand as planned), and any special arrangements necessary. If an agreement to contract the service to an outside concern is made, it contains controls, checks and balances.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- Existing operating practices from various states' one-call centers.
- One-Call Systems International Directory.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

4. **ONE-CALL CENTER GOVERNANCE**

Practice Statement: The one-call center is governed by a board of directors representing the diverse makeup of the constituent groups, for example facility owners/operators, designers, contractors/excavators, and government.

Practice Description: To ensure that a one-call system functions to the best benefit of the entire community, it is governed by a board of directors made up of representatives of the stakeholders. Board members are from a variety of industry types, such as facility owners operators, contractors, designers, project owners and government representatives. Each board member is knowledgeable in their own industry and of how it interacts with the one-call system and all of the represented stakeholders.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- Existing operating practices from various states' one-call centers.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

5. **SINGLE TOLL FREE STATEWIDE NUMBER WITH NATIONWIDE ACCESS**

Practice Statement: The one-call center(s) have a single toll free statewide number with nationwide access.

Practice Description: There will be only one statewide toll free telephone number for the one-call center(s) to receive locate requests. This number has nationwide access, meaning that a caller can reach the center(s) from anywhere in the country.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- Existing operating practices from various states' one-call centers.
- 49CFR Part 198.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

6. **HOURS OF OPERATION**

Practice Statement: The one-call center can process locate requests 24 hours a day, 7 days per week.

Practice Description: The one-call center has in place a process where a caller, at anytime of the day or night, every day of the year, who has a locate request can contact the one-call center and have that request processed.

References:

- Existing operating practices from various states' one-call centers.
- One-Call Systems International Directory.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

7. **VOICE RECORD OF ALL INCOMING CALLS**

Practice Statement: A voice recording is maintained of all voice transactions concerning requests to locate facilities.

Practice Description: A voice recording of telephone communications for locate requests is made to ensure a precise record of the activity is retained. This recording can be legally supported in court as well as used for damage investigations.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- Existing operating practices from various states' one-call centers.
- 49CFR Part 198.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

8. **RETENTION OF VOICE RECORDS ACCORDING TO APPLICABLE STATUTES**

Practice Statement: Voice records of all calls concerning requests to locate facilities are kept in retention according to applicable statutes.

Practice Description: Voice recordings are a factual record of the events that occurred between the caller and the one-call center. These factual records must be maintained and accessible until the applicable statute of limitations in the state have expired. Since these laws vary from state to state, no specific time period is set forth as best practice. In the absence of notice by some party to the contrary, after the expiration of the statute of limitations the records may be destroyed. The one-call center has a procedure for processing requests for voice information.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- Existing operating practices from various states' one-call centers.
- 49CFR Part 198.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

9. **CALLER FEEDBACK**

Practice Statement: The one-call center provides the caller with the ticket number and the names of facility owners/operators who will be notified for each locate request.

Practice Description: Providing the locate request number and the names of the facility owners/operators who will be notified enhances the efficiency of the one-call process. When provided the names of the facility owners/operators, the excavator knows which owners operators will be notified in the area of the planned excavation. This helps the excavator determine if the facility owners/operators have responded to the locate request.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.
- 49CFR Part 198.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

10. **PRINTED TICKET RECALL**

Practice Statement: The one-call center can provide a printed copy of any ticket for a period of time determined by applicable statutes.

Practice Description: In the event of a damage investigation, litigation, or other event, it is often necessary to have a hard copy printout of a location request ticket. Local governments have statutory requirements for record retention in such cases. The one-call center has the ability to produce, as necessary, a copy of a location request ticket for the appropriate statutory period.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.

- Existing operating practices from various states' one-call centers.
- 49CFR Part 198.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

11. DOCUMENTED OPERATING PROCEDURES, HUMAN RESOURCE POLICIES, AND TRAINING MANUALS

Practice Statement: The one-call center has documented operating procedures, human resource policies and training manuals.

Practice Description: The one-call center has documented operating procedures, human resource policies, and training manuals. Training manuals, practices, procedures, and policies are on the premises in a designated area or place, dated, and available for reference.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- Existing operating practices from various states' one-call centers.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

12. DOCUMENTED OWNER VERIFICATION OF DATA SUBMITTED BY FACILITY OWNERS/OPERATORS

Practice Statement: The one-call center returns the geographic description data base documentation to the facility owner/operator annually and after each change for verification and approval.

Practice Description: The one-call center can only work with the information related to the existence of buried facilities that its members provide. It is important that the one-call center be able to produce evidence that a member's data is accurate, according to that member. Regular verification of data is a part of the documented agreement or operating procedures between the owner or operator of buried facilities and the one-call center. Any deletions or additions made by the member are entered into the data base and documentation of the change sent back to the member for verification, prior to activation.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

13. FLEXIBILITY FOR GROWTH AND CHANGE

Practice Statement: The operating plan of the one-call center is sufficiently flexible to accommodate growth and change.

Practice Description: A successful one-call center maintains flexibility to respond to changes by forming and maintaining a responsive organization whose Board of Directors' composition allows adequate representation of the needs of all stakeholders. A Board's ability to respond to change will be enhanced by drafting bylaws and operating procedures that reflect the current environment in which the one-call center serves. The most successful Boards review these documents on an ongoing basis to make sure they continue to reflect or respond to current conditions. These Boards conduct regular strategic planning sessions during which they review the current state of the Center's major systems, programs and outreach activities. Such assessments help them identify stakeholder needs for future growth and development.

Many members of Boards and center management teams keep themselves informed about and involved in the one-call industry by joining associations and attending conferences or other educational events that help them to better identify new opportunities for growth and change.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

14. MEETING BETWEEN THE EXCAVATOR AND FACILITY OPERATOR(S) INITIATED BY ONE-CALL NOTIFICATION

Practice Statement: The one-call center has a process for receiving and transmitting requests for meetings between the excavator and the facility operator(s) for the purpose of discussing locating facilities on large or complex jobs.

Practice Description: The one-call center relays requests for job site facility meetings for excavators who request them with facility owners/operators. If a meeting is required to show the limits and schedule of the work, the one-call center indicates that a meeting is requested. The one-call center requires that the excavator provide sufficient information to fully identify the boundaries of the proposed work site. A meeting request does not necessarily eliminate the need for a locate request.

References:

- Existing operating practices from various states' one-call centers.
- One-Call Systems International Directory.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

15. ONE-CALL CENTER ACCEPTS NOTIFICATIONS FROM DESIGNERS

Practice Statement: The one-call center accepts design requests and has the ability to process them as designated by the facility owners/operators.

Practice Description: To facilitate damage prevention, project designers have a need for access to facility location information from facility owners/operators. If a design request is received, the one-call center provides a listing of facility owners/operators directly to the designer. Once the list is identified, the one-call center processes the request as designated by each facility owner/operator.

References:

- Existing operating practices from various states' one-call centers.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

16. LOCATE REQUEST

Practice Statement: The one-call center captures the following information, at a minimum, on a locate request: the caller's name and phone number; the excavator's/company's name, address and phone numbers; the specific location of the excavation; the start date and time of the excavation; and the description of the excavation activity.

Practice Description: A locate request is a communication between an excavator and one-call center personnel in which a request for locating underground facilities is processed. In addition to the minimum information required in the practice statement (above), the locate request should include any information, if available, that will help to establish the specific location of the excavation site. This additional information could include, for example:

A. More detailed information to help determine the specific location of the excavation. Such information may include:
   1. City
   2. County/Parish/Township
   3. State
   4. Street address
   5. Street name
   6. Length and direction of the excavation and the nearest adjacent cross streets (needed to bound area of excavation or extended excavation)
   7. Subdivision and lot number (for new development)
   8. Latitude/Longitude: Latitude-longitude coordinate(s) or specific address of the dig site may be done automatically by the GIS subsystem or determined by computer assisted customer service representative. The dig site can be a point, and area or box, or a polygon. For a spatial rectangle (maximum/minimum latitude/longitude), the dig site must be wholly within the included area.
   9. Highway mile markers
   10. Railroad mileposts
   11. General directions/instructions

12. Map grids
13. Distance to nearest cross-street
14. Any other pertinent references to help establish the location of the dig site

B. The intended start date and time of the excavation (i.e., the date excavation is actually expected to begin, which may be later than when excavation can legally begin based on the ticket date).
C. Type of the excavation activity (e.g., boring, blasting, trenching, etc.)
D. Who the excavation work is being done for
E. What is the purpose of the work (i.e., what will be installed and or built)
F. Additional remarks

References:

- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.
- 49CFR Part 198.

17. PRACTICES TO REDUCE OVER-NOTIFICATIONS

Practice Statement: The one-call center employs practices de signed specifically to reduce the number of notices transmitted to facility owners/operators, in which the reported excavation site is outside the owner's/operator's desired area of notification.

Practice Description: The one-call center employs technology that allows the facility owner/operator to determine its desired area of notification by either polygons or grids. To reduce over-notifications, the technology should:

- enable the call center to define the proposed excavation site buffer to within approximately 800 feet; and
- provide the facility owner/operator the ability to identify its desired area of notification to within approximately 100 feet.

References:

- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

18. DISASTER RECOVERY

Practice Statement: A one-call center develops, implements, and maintains an effective disaster recovery plan enabling the one-call function to continue in the event of a disaster.

Practice Description: The one-call center develops and implements an effective disaster recovery plan enabling it to continue operations in the aftermath of a disaster affecting the facility. Excavators and underground facility owners/operators outside of the area affected by the disaster can continue to conduct business with minimum to no delays in the services provided by the one-call center. The disaster recovery plan makes provisions for the one-call center to process emergency locate requests for the areas affected by the disaster. The one-call center (the primary center) has a backup arrangement with another facility at a remote location (the secondary center). This arrangement includes:

- Telecommunications - alternate routing schedules are in place, ready to be activated within minutes of the primary centers' failure.
- Software and Hardware - the secondary center has compatible hardware with the primary center. The secondary center always has a copy of the primary's current software.
- Database - the secondary center receives the primary center's database including locate requests on a regular basis, preferably real-time.
- Staffing - a portion of the secondary center's staff is cross-trained for the primary center's operation at all times.
- Simulated Emergency Testing - At least once a year, on a random basis, the disaster recovery plan is implemented to verify that it is operational.

References:
- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.

19. REMOTE USER INTERFACE

Practice Statement: The one-call center provides users a means of direct, electronic entry of locate requests that maintains comparable ticket quality to an operator-assisted entry.

Practice Description: The one-call center has interactive data communications sufficient to permit remote data entry for members and excavators. The remote interface validates the input information and allows the user to make corrections if necessary. This correction is accomplished by referencing the same geographic database used at the one-call center when taking a voiced-in request. This process ensures that the ticket quality is maintained for all tickets.

References:
- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.
- NTSB Safety Study (NTSB/SS-97/01; PB97-917003).

20. ACCEPT MULTIPLE REFERENCE POINTS FOR LOCATE REQUESTS

Practice Statement: The one-call center is able to accept multiple types of points of reference to define the exact location of an excavation site (i.e., latitude/longitude, highway/railroad/pipeline mile markers, address, street and cross-street, etc.).

Practice Description: The one-call center's locate request taking processes and computer system are designed to accept and process multiple types of reference points used by callers to (1) describe the location of their work and (2) define the excavation site. Examples of different types of reference points include: highway mile markers, railroad mileposts, valid address or street-cross street, latitude longitude, township-range-section, city, county, political and mail address (zip code) boundaries, etc. All stakeholders involved in the one-call process receive a corresponding benefit when the call center is able to define the excavation site as specifically as possible. The facility operator's job of determining the existence of a potential conflict is expedited, field personnel can find and mark the affected area much easier, and the excavator receives timely markings covering the area of excavation. Standardizing on a limited set of criteria reduces the flexibility of the system to serve the excavator and facility owner/operator. The one-call center invests in systems and processes that permit inclusion of a variety of types of reference points in defining the excavation site. The one-call center takes steps to link these reference points to the database used to register the facility operator's desired area of notification, thereby assisting in reducing over-notification.

References:
- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.

21. ONE-CALL CENTER SECURITY

Practice Statement: The one-call center provides appropriate physical and systems security, fire protection and electrical protection to protect the one-call center and its critical components.

Practice Description: The one-call center needs protection from natural disasters and other threats. Since the one-call center is a critical link in the communication chain between the excavating community and facilities, it is important that the one-call center does whatever it can to provide adequate security, taking into account that it may well need to be operational in times of natural disasters or in the face of other threats. Security components could include:
- Physical security for the building and its employees through locked operations areas, lighting, employee key cards, guard patrols.
- Physical security for critical systems components. This may include locating the facilities in locked enclosures and restricting access to necessary personnel.

- General fire protection for the one-call center personnel and property.
- Specialized fire protection for critical systems components.
- Specialized theft protection for critical systems components.
- Telephone demarcation points in a protected area within the One Call Center.
- Passwords and protections to limit access to computers and other systems.
- Offsite storage of duplicate data base and necessary system software.

Reference:

- Existing operating practices from various states' one-call centers.

22. HARDWARE DESIGNED TO TOLERATE A SINGLE POINT OF FAILURE

Practice Statement: The one-call center uses fault tolerant hardware for its critical path operations, such as ticket taking, database access, and ticket delivery.

Practice Description: A fault tolerant system can withstand any single hardware malfunction without any interruption or degradation of service. These systems have the ability to identify the malfunctioning hardware component and permit its replacement while remaining online and processing its normal applications. These fault tolerant systems maximize the probability that the call center will be able to properly process an excavation request in the event of a failure or malfunction.

References:

- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.

23. ONE-CALL QUALITY STANDARDS

Practice Statement: The one-call center establishes performance standards for the operation of the center for the purpose of promoting accuracy, cost effectiveness and efficiency.

Practice Description:

A. Customer Quality of Service Performance Measurements - It is best practice in the one-call center industry to monitor the quality of service provided to the customer calling the center. Key measurements include:

1. Speed of Answer
   Process - Most call centers route incoming calls through an ACD (automatic call distributor) either via an on-premise PBX or a Centrex at the telephone company's central office. Both of these devices provide reports that identify, on the average, how long a caller had to wait before they were answered. This measurement is called average speed of answer (ASA) and is normally captured on a half hourly basis and accumulated for the day.
   Service Level - An objective service level should be set based on customer satisfaction and economics. An ASA objective of 30 seconds or less is recommended.
2. Abandoned Calls
   Process - The PBX or Centrex also provides this data. It will normally identify the number of calls abandoned and how long the callers waited before they hung up.
   Service Level - An objective service level should be set based on percentage of calls. An abandonment rate of less than 5% by callers that waited more than 60 seconds is a reasonable objective.
3. Busy Signals
   Process - The one-call center is equipped with sufficient incoming lines to minimize busy signals.
   Service Level - The performance level for busy signals received by callers into the one-call center does not exceed 1% of the total incoming call volume.

4. Customer Satisfaction
   Process - A fundamental principal in measuring quality is that "the customer defines quality." Periodic customer satisfaction surveys of callers are conducted.
   Service Level - An objective service level is set based on percentage of caller's responses. An objective of 99% customer satisfaction is recommended.

B. Locate Request Content
   The one-call center has in place a quality of service plan which includes measurements of accuracy, productivity, and defects in locate request tickets.

C. Relational Database Quality and System Functionality
   The geographic, relational database and the system that uses it confirms the hierarchical relationship between the street address, street, municipality, county and state.

D. Locate Request Delivery
   The one-call center establishes the following minimum criteria for quality of locate request delivery. Transmission audit reports are sent to receiving locations daily.
   1. Average emergency ticket transmission time (< 5 minutes)
   2. Average short notice ticket transmission time (< 15 minutes)
   3. Average normal ticket transmission time (< 30 minutes)
   4. The ticket information should be transmitted in an electronic data format that allows the receiving equipment to parse/extract the data.

E. Ratio of Incoming Locate Requests to Outgoing Ticket Transmission
   The one-call center monitors the ratio of incoming locate requests to outgoing ticket transmissions. This data assists in evaluating the center's marketing, education, mapping, budgeting, and cost performance.

References:

- One Call Systems International (OCSI) Voluntary Recognition Program.
- "Model One-Call For The 20th and 21st Century," AT&T.
- Existing operating practices from various states' one-call centers.

For additional information on the Common Ground Alliance or to learn how to become a member, visit the CGA web site at www.commongroundalliance.com.

Locating and Marking Best Practices

1. **LOCATORS UTILITZE AVAILABLE FACILITY RECORDS AT ALL TIMES.**
   Practice Description: Facility locators use available records at all times. Facility records indicate approximate location, number of facilities and access points for buried facilities within a requested area. The use of facility owner/operator supplied records is an effective method of identifying facilities as part of the locating process.
2. **IF A FACILITY LOCATOR BECOMES AWARE OF AN ERROR OR OMISSION, THEN THE FACILITY LOCATOR PROVIDES INFORMATION FOR UPDATING RECORDS THAT ARE IN ERROR OR TO ADD NEW FACILITIES.**
   Practice Description: During the course of a locating activity, a locator may become aware of errors or omissions. Methods are in place to notify a facility owner/operator of that error or omission. The corrections are submitted to the appropriate person or department in a timely manner. The method of notification is determined by the facility owner/operator and includes the following information:
   - Name (and company if contracted),
   - Contact phone number of the individual(s) submitting change,
   - Location (either address or reference points),
   - Size and type of facility,
   - Nature of the error or omission, and
   - Sketch of the change in relation to the other facilities.

   Omissions and errors may occur due to misdrawn records, changes during construction at the job site, repair or abandonment of facilities and delays in posting new records. Failure to note errors or omissions when found could result in damages to the facility at a later date. The 1994 NTSB Excavation Damage Prevention Workshop stated: "facility operators should be required to update maps when excavation finds errors in the mapping system."[7]
3. **A UNIFORM COLOR CODE AND SET OF MARKING SYMBOLS IS ADOPTED NATIONWIDE.**
   Practice Description: A national standard is adopted defining color specifications relevant to facility type. The specifications could be similar to the accepted NULCA[8] or APWA[9] standards. The December 1997 National Transportation Safety Board safety report[10] cites the use of the APWA/ULCC color code as the model example. **(See Appendix B for Additional Practice Information)**
4. **A SINGLE LOCATOR IS USED FOR MULTIPLE FACILITIES.**
   Practice Description: This practice is employed when determined to be advantageous by the facility owner/operator. The use of a single locator to mark multiple facilities may provide several advantages to both the facility and the excavating communities. Among these advantages are:
   - more responsive service to the excavation community,
   - better communication with the excavating community (fewer points of contact),
   - improved safety due to less traffic on the road,
   - improved worker safety,
   - reduced environmental impact, and
   - maps of multiple facilities.

7 National Transportation Safety Board, 1995. Proceedings of the Excavation Damage Prevention Workshop; 1994 September 8-9; Washington, DC, Report of Proceedings NTSB/RP-95/01 (pp.177-178), Washington, DC.

8 National Utility Locating Contractors Association, 1998. Underground Facility Marking Standards, Spooner, WI.

9 American Public Works Association, 1999. Guidelines for Uniform Temporary Marking of Underground Facilities.

10 National Transportation Safety Board, 1997. Protecting Public Safety through Excavation Damage Prevention, Safety Study NTSB/SS-97/01 (pp. 25-26), Washington, DC.

It should be noted that this best practice does not suggest that all facilities be located by a single locator, but rather that conditions exist in which locating multiple facilities with a single locator will reduce the likelihood of errors and resulting damage (e.g., multiple facilities with the same owner or multiple facilities that are marked with the same or similar color codes). This practice has been employed by a facility owner in Michigan to enhance safety. The use of a single locator to locate multiple facilities is analogous to the use of one-call systems to handle locate requests from excavators. The use of a one call system allows locate requests for multiple facilities at an excavation site to be issued through a single point of contact, simplifying communications. The use of a single locator to carry out locate requests for multiple facilities further simplifies communications, with fewer links needed between excavator and locator.

5. **LOCATORS ARE PROPERLY TRAINED. LOCATOR TRAINING IS DOCUMENTED.**

   Practice Description: Minimum training guidelines and practices are adopted for locator training. These guidelines and practices include the following:

   - Understanding System Design/Prints/Technology
   - Understanding Construction Standards and Practices for all Types of Facilities
   - Equipment Training and Techniques
   - Plant Recognition Training
   - Theory of Locating
   - Daily Operations
   - Facility Owner/Excavator Relationships and Image
   - Safety Procedures Per OSHA Regulations/Federal, State and Local Laws
   - Written and Field Testing
   - Field Training
   - Annual Retesting.

   The NULCA Locator Training Standards and Practices[11] represent an accepted model within the locate industry.

   Documentation of all training is maintained to ensure that facility locators have been properly trained.

6. **LOCATES ARE PERFORMED SAFELY.**

   Practice Description: It is the responsibility of the owner/operator and locator to establish when and how the underground facility will be identified. All hazards associated with a performing a locate are identified. Appropriate measures conforming to federal, state, local and industry standards are established. Employees are made aware of these hazards and properly trained in worker safety standards.

   A. Pre-Work Safety Considerations
      1. Site Background Data. Site information is gathered to determine hazards, exposures, and/or other potential safety problems that might be encountered in connection with on site locate work. This information may be gathered from the facility records and from visual inspection.
      2. Site Familiarization. Site characteristics which could affect locate work are analyzed. Areas to be considered include:
         a. Obstructions. The site is analyzed to determine if physical obstructions are present on the property which would make locate work unsafe. Means for working around such obstructions are defined.
         b. Traffic. Vehicular arteries (highways, roadways, railways, etc.) at the work site are identified to determine if such traffic would pose any safety hazard to locating the site.
         c. Physical Site Conditions. Soil conditions and other factors (such as trenches, pits, bores, standing water, etc.) that could affect the safety of the job site are identified. Methods are developed to identify and safely work around these hazards.

11 National Utility Locating Contractors Association, 1996. Locator Training Standards and Practices, Spooner, WI.

3. External Resources. Information is gathered about safety-related resources that might be required in the event of an accident or other problem (such as an employee illness). Information needed includes location and contact information for nearest hospital, fire department, police department, and any other public emergency response organization. In addition, access routes and travels plans to emergency response facilities are defined.
4. Work Plan. A work plan in which procedures, employee roles, equipment requirements, time requirements, and other factors are considered is developed to define the most efficient means for safely accomplishing required locate work. This work plan considers all of the safety related information developed in connection with items #2 and #3.
5. Job Briefing. Information developed as discussed in preceding items #1 through #4 is used to conduct a job briefing prior to commencement of on site locate work. The job briefing focuses on safety aspects of the required work.

B. Locate Work Safety Considerations
1. Personnel Protection. Watchman/lookout capabilities are provided to ensure the safety of personnel in cases where locate work requires that working individuals disrupt traffic flow or otherwise occupy hazardous positions. All working individuals wear proper safety attire. Such attire provides for adequate visibility of the worker and personal protection against hazards.
2. Equipment. All equipment used in connection with locate work is suitable for the intended uses. Items such as ladders, electrical test devices, and other instruments and items are inspected from a safety perspective prior to use. Safety features such as locking devices, grounding, insulation, etc., are thoroughly inspected.
3. Exposures. In cases where locate work requires personnel to enter into spaces with potentially unsafe conditions, appropriate testing is accomplished prior to entry. During times when such spaces are occupied, adequate monitoring and/or ventilation devices are present and properly operating during occupancy.
4. Work Activities. All locate work activities are conducted with safety given first priority. All employees are thoroughly trained and briefed regarding safety measures such as minimizing exposures to potentially hazardous conditions, avoiding unnecessary risks, and giving priority to personal safety.

C. Post Work Safety Considerations
1. Termination of Work Activities. After locate work is completed, the site is restored and left in such a condition that no safety hazards associated with the locate work activities remain. All personnel and equipment utilized in connection with the work are accounted for and no unsafe conditions remain at the site. Any safety-related equipment used in connection with the work is returned/restored to pre-work status.
2. Debriefing. After completion of locate work, a debriefing safety review of work activities is conducted. This review is conducted with the objective of looking at the safety aspects of all involved work practices as necessary to see where unnecessary exposures may have occurred and where improvements could be made.

7. A VISUAL INSPECTION IS COMPLETED DURING THE FACILITY LOCATING PROCESS.

Practice Description: This inspection includes the following:

- all facilities within a facility owner/operator's service area (to evaluate the scope of the locate request),
- identification of access points,

- identification of potential hazards, and
- assurance that plant facilities shown on records match those of the site.

The primary reason for a visual inspection is to determine if there are facilities placed that are not on record. It is very important that visual inspections be completed in areas of new construction, where records may not indicate the presence of a facility. The visual inspection is necessary because the time it takes for a facility placed in the field to be placed on permanent records varies by facility owner/operator and location. Evidence of a facility not on record includes, but is not limited to, poles, dips, enclosures, pedestals (including new cables found within the pedestals), valves, meters, risers, and manholes.

8. **FACILITIES ARE ADEQUATELY MARKED FOR CONDITIONS.**
   Practice Description: Facility locators match markings to the existing and expected surface conditions. Markings may include one or any combination of the following: paint, chalk, flags, stakes, brushes or offsets. All marks extend a reasonable distance beyond the bounds of the requested area. Proper training for all facility locators includes properly identifying the varying surface and environmental conditions that exist in the field and what marking methods should be used. Conditions which may affect markings are rain, snow, vegetation, high traffic, construction, etc.
9. **POSITIVE RESPONSE IS PROVIDED TO FACILITY LOCATE REQUESTS.**
   Practice Description: All facility locate requests result in a positive response from the facility owner/operator to the excavator. A positive response may include one or more of the following: markings or documentation left at the job site, callback, fax, or automated response system. A positive response allows the excavator to know whether all facility owners/operators have marked the requested area prior to the beginning of the excavation.
10. **MULTIPLE FACILITIES IN THE SAME TRENCH ARE MARKED INDIVIDUALLY AND WITH CORRIDOR MARKERS.**
    Practice Description: In general, the number of lines marked on the surface equal the number of lines buried below. "All facilities within the same trench should be individually marked and identified. In situations where two facilities share the same color code (such as telephone and CATV) both facilities should be identified and the marks placed parallel, but with enough separation so that they may be readily identified."[12] In circumstances where the total number of lines buried in the same trench by a single facility owner/operator may not be readily known, a corridor marker is used. The corridor mark indicates the width of the facility.
11. **INFORMATION ON ABANDONDED FACILITIES IS PROVIDED WHEN POSSIBLE.**
    Practice Description: When the presence of an abandoned facility within an excavation site is known, an attempt is made to locate and mark the abandoned facility. When located or exposed, all aban doned facilities are treated as live facilities. Information regarding the presence or location of an abandoned facility may not be avail able because of updating or deletion of records. In addition, the process of abandoning an existing facility, damage to an abandoned facility, or limited or non-existing access points may render an abandoned line non-locatable. It should be emphasized that recommendation of this practice is not an endorsement of the maintenance of records for abandoned facilities.
12. **WHEN LOCATING ELECTRO-MAGNETICALLY, ACTIVE/CONDUCTIVE LOCATING IS PREFERABLE TO PASSIVE/INDUCTIVE LOCATING.**
    Practice Description: The preferred method of actively applying a signal onto a facility is to use direct connection. Direct connection is the process of connecting a direct lead from the transmitter to the

[12] National Utility Locating Contractors Association, 1998. Underground Facility Marking Standards, Spooner, WI.

target facility, and connecting a ground lead from the transmitter to a ground point in order to complete a circuit. This process provides the strongest signal on the line and is less likely to "bleed over" to adjacent facilities than other methods of applying a signal. This method allows a greater range of frequency and power output options. It is good practice to use the lowest frequency possible at the lowest power output possible to complete the locate. If direct connection is not possible, use of an induction clamp (coupler) is the most effective method of applying a locate signal onto the target conductor. This method is more limiting for the choices of frequency and power outputs than direct connection. Using an induction clamp is not as effective at transmitting a signal as direct connection, can only be used within certain frequency ranges, and must use a higher power output. The least preferred method is induction or broadcast mode on a transmitter. This usually results in a weak signal that will "bleed over" to any conductor in the area.

13. **THE FACILITY OWNER/OPERATOR IS IDENTIFIED**
Practice Description: When feasible, the owner/operator of a facility is identified by markings at the time the facility is located. This practice facilitates a positive response for all facilities within the requested area. The NULCA Marking Standards recommends "In situations where two facilities share the same color code (such as telephone or CATV) both facilities should be identified. . . ."[13]

14. **COMMUNICATION IS ESTABLISHED BETWEEN ALL PARTIES.**
Practice Description: One-call centers, facility owners/operators, and excavators all have clearly defined processes to facilitate communication between all parties. If the complexity of a project or its duration is such that a clear and precise understanding of the excavation site is not easily conveyed in writing on a locate request, then a pre location meeting is scheduled. This pre-location meeting is on-site to establish the scope of the excavation. Written agreements between the excavator(s) and the locator(s) include:
    - date
    - name
    - company
    - contact numbers for all parties
    - a list of the areas to be excavated
    - a schedule for both marking and excavating the areas
    - any follow up agreements that might be necessary

    Any changes to the areas that are to be located are in writing and include all parties responsible for the excavation and marking of the excavation sites. Locators also schedule meets if the complexity of the markings requires further explanation.

15. **DOCUMENTATION OF WORK PERFORMED ON A LOCATE IS MAINTAINED.**
Practice Description: A facility locator always documents what work was completed on a locate request. This assists in the locate process by making a locator review what was located and then verify that all facilities within the requested area were marked. Careful documentation helps ensure that there is an accurate record of the work that was performed by the locator and helps eliminate confusion over what work was requested by the excavator.

16. **A DAMAGED FACILITY IS INVESTIGATED AS SOON AS POSSIBLE AFTER OCCURANCE OF DAMAGE.**
Practice Description: Any time a damage occurs, a proper investigation is performed. This is to determine not only the responsible party but also the root cause of the damage. The information gathered from damage investigations is essential in preventing future damages.

[13] National Utility Locating Contractors Association, 1998. Underground Facility Marking Standards, Spooner, WI.

17. FORECASTING/PLANNING FOR PREDICTABLE WORKLOAD FLUCTUATIONS. A PLAN IS DEVELOPED FOR DEALING WITH UNPREDICTABLE FLUCTUATIONS.

Practice Description: Facility owners/operators and/or their representatives develop methods to sufficiently forecast and plan for future workloads in order that ticket requests may be completed in a timely manner. This will ensure that adequate personnel and equipment will be available to complete all locate requests. It should be noted that this practice does not involve limiting the number of one-call requests from excavators.

18. UNDERGROUND FACILITY OWNERS/OPERATORS HAVE A QUALITY ASSURANCE PROGRAM IN PLACE FOR MONITORING THE LOCATING AND MARKING OF FACILITIES.[14]

Practice Description: The process of conducting audits for locates is a critical component to the protection of underground facilities. The recommended components below were assembled from multiple sources and are meant to provide general guidelines for auditing the work of locators.

Components:

1. Field audits are to be conducted and some locations to be audited/surveyed are chosen purely at random.
2. Accuracy to within, governed, contractual, minimum, tolerance levels are checked.
3. Timeliness, as defined by regulation/statute is measured.
4. Completion of request is checked.
5. Evidence of accurate and proper communication is checked.
6. Proper documentation is checked.
7. Audit/Survey is documented.
8. Results are communicated to applicable personnel.
9. Audits are traced for trend analysis.
10. Proper hook-up and grounding procedures are verified where applicable.
11. Verify reference material used when providing the locate was up to date (electronic plans or paper plans).
12. Verify that appropriate safety equipment and procedures were used by the locator.
13. Tools and equipment be in proper working order and properly calibrated.

References: Health Consultants Incorporated; Central Locate Services, LTD; Great Plains Locating, ATCO Gas; Utiliquest

[14] TR-2003-02: Ammemdment Approved by the CGA Board on March 26, 2004.

Excavation Best Practices

5.6.1 Project Preparation

1. **ONE-CALL FACILITY LOCATE REQUEST**

   Practice Statement: The excavator requests the location of underground facilities at each site by notifying the facility owner/operator through the one-call system. Unless otherwise specified in state law, the excavator calls the one-call center at least two working days and no more than ten working days prior to beginning excavation.

   Practice Description: Currently 48 states have passed one-call legislation and have established one-call notification systems recognizing that excavation performed without prior notification poses a risk to public safety, excavators, the environment, and disruption of vital services provided by facility operators. Increased participation in this one-call notification system provides for im proved communication between excavators and facility operators necessary to reduce damage. Laws in 41 states call for a minimum of 2 days prior and laws in 16 states call for no more than 10 days.

   Reference:

   - Existing state laws, including Ohio and West Virginia.

2. **WHITE LINING**

   Practice Statement: When the excavation site can not be clearly and adequately identified on the locate ticket, the excavator designates the route and/or area to be excavated using white pre-marking prior to the arrival of the locator.

   Practice Description: The route of the excavation is marked with white paint, flags, stakes, or a combination of these to outline the dig site prior to notifying the one-call and before the locator arrives on the job. Pre-marking allows the excavators to accurately communicate to facility owners/operators or their locator where excavation is to occur. The 1997 safety study "Protecting Public Safety Through Excavation Damage Prevention" by the NTSB reached the conclusion that pre-marking is a practice that helps prevent excavation damage. Maine was one of the first states to have mandatory pre-marking for non-emergency excavations. Connecticut has also adopted a pre marking requirement; however, the law provides for face-to-face meetings between operators and excavators on projects that are too large for or not conductive to pre-marking. Facility owners/operators can avoid unnecessary work locating facilities that are not associated with planned excavation. **(See Appendix B for Additional Practice Information)**

   Reference:

   - Existing state laws, including California, Missouri, New Jersey and others.

3. **LOCATE REFERENCE NUMBER**

   Practice Statement: The excavator receives and maintains a reference number from the one-call center that verifies the locate was requested.

   Practice Description: All calls from excavators processed by the one call center receive a unique message reference number, which is contained on all locate request messages. The excavator records this number; it is proof of notification to the members. The computer generated request identifies the date, time, and sequence number of the locate request. Each locate request ticket (notification) is as signed a unique number with that one-call center, the requestor and the facility owner/operator. This number separates this ticket from all other tickets so that it can be archived and recalled upon request with the details of that request only.

   References:

   - Existing state laws, all 50 states have one-call centers and/or state statues.
   - Existing operating procedures from various states one-call centers.

4. **PRE-EXCAVATION MEETING**
   Practice Statement: When practical, the excavator requests a meeting with the facility locator at the job site prior to the actual marking of facility locations. Such pre-job meetings are important for major, or unusual, excavations.
   Practice Description: The meeting will facilitate communications, coordinate the marking with actual excavation, and assure identification of high priority facilities. An on-site pre-excavation meeting between the excavator, the facility owners/operators and locators (where applicable) is recommended on major or large projects. This include projects such as road, sewer, water, or other projects that cover a large area, progress from one area to the next, or that are located near critical or high priority facilities. Such facilities include, but are not limited to, high-pressure gas, high voltage electric, fiber optic communication, and major pipe or water lines.
   References:
   - Existing insurance carrier guidelines.
   - Existing practice among excavators, including Pauley Construction and W.F. Wilson & Sons, Inc.
5. **FACILITY RELOCATIONS**
   Practice Statement: The excavator coordinates work which requires temporary or permanent interruption of a facility owner/operator's service with the affected facility owner/operator in all cases.
   Practice Description: Any temporary or permanent interruption requires the active participation by the facility owner/operator and the excavator to ensure protection of facilities through a joint preplanning meeting or conference calls. One-call centers note\ special contractor requests for a joint meeting on the ticket to the facility owner/operator to initiate the process.
   Reference:
   - Existing practice among one-call centers.
6. **SEPARATE LOCATE REQUESTS**
   Practice Statement: Every excavator on the job has a separate one call reference number before excavating.
   Practice Description: Often, there are several excavators on a job site performing work. The construction schedule may dictate different types of work requiring excavation from different specialty contractors simultaneously. In these situations it is imperative for each excavator to obtain a one-call reference number before excavation to ensure that the specific areas have been appropriately marked by any affected underground facility owner/operator.
   Reference:
   - Existing state laws, including Ohio, Kansas, Michigan, Maryland, Illinois and others.
7. **ONE-CALL ACCESS (24x7)**
   Practice Statement: The excavator has access to a one-call center 24 hours per day, 7 days a week.
   Practice Description: Utilities service the public needs 24x7 and thus should be protected the same amount of time. Certain conditions exist which requires excavators to work during off-hours (city/road congestion, off peak utility service hours). While most excavators are on the job site during regular work hours, the ability to call in future work locations after five p.m. allows more flexibility to schedule work, not to mention getting around peak hours of locate requests at the one-call center.
   Reference: Existing states laws, including Texas, Idaho, Minnesota, Pennsylvania, and others. There are 25 participating states or one call centers with 24x7 access.
8. **POSITIVE RESPONSE**
   Practice Statement: The excavator is notified by the underground facility owner/operator of the tolerance zone of the underground facility by marking, flagging, or other acceptable methods at the work site, or is notified that a no conflict situation exists. This takes place after notification from the one-call center to the underground facility owner/operator and within the time specified by state law.

Practice Description: If a facility owner/operator determines that the excavation or demolition is not near any of its existing underground facilities, it notifies the excavator that no conflict exists and that the excavation or demolition area is "clear." This notification by the facility owner/operator to the excavator may be provided in any reasonable manner including, but not limited to: face-to-face communications; phone or phone message, facsimile or other electronic means; posting at the excavation of demolition area; or marking the excavation or demolition area. If an excavator has knowledge of the existence of an underground facility and has received an "all clear," a prudent excavator will attempt to communicate that a conflict does indeed exist and the locator should make marking these facilities a priority before excavation begins. More communication between the excavator and the facility owner operator is a growing necessity as the area of excavation is getting more crowded everyday with new underground facilities. Positive response is a term used to describe the two types of action to be taken by a facility owner/operator after it has received notification of intent to excavate. The facility owner/operator is required to 1) mark its underground facilities with stakes, paint or flags or 2) notify the excavator that the facility owner/operator has no underground facilities in the area of excavation. This process allows the excavator to begin work on time or in a timely manner. When the excavator makes the request to the one-call center, he/she is told which facility owners/operators will be notified. The excavator logs these facilities on his/her job sheet so that he/she can identify which facility owners operators have responded by marking and which ones have cleared the area. On the flip side, when a facility owner/operator does not respond by marking or clearing, this could signal that the facility owner/operator did not receive a locate notice. It could also indicate that the facility owner/operator data base used at the one-call center is either corrupt or lacking the correct information to process the request at the location, which could result in calamity. Once the excavator has all of the information needed for the work area, he/she can then excavate with confidence with safety in mind for the work crew and the public at large.

References:

- Existing state laws, including California, Maryland, Nevada and others.
- Existing operating procedure for various one-call centers. (Number of participating states or one-calls: 31.)

5.6.2 On-Site Preparation/Ground Breaking

9. FACILITY OWNER/OPERATOR FAILURE TO RESPOND

Practice Statement: If the facility owner/operator fails to respond to the excavator's timely request for a locate (e.g., within the time specified by state requirements) or if the facility owner/operator notifies the excavator that the underground facility cannot be marked within the time frame and a mutually agreeable date for marking cannot be arrived at, the excavator re-calls the one-call center. However, this does not preclude the excavator from going on with the project. The excavator may proceed with excavation at the end of two working days, unless otherwise specified in state law, provided the excavator exercises due care in his endeavors.

Practice Description: It is determined that the facility owner/operator and the excavator will partner together to ensure facilities are marked in an acceptable time frame to allow for underground facility protection.

Reference:

- Existing state laws, including Ohio, Kansas, South Carolina, Michigan and others.

10. LOCATE VERIFICATION

Practice Statement: Prior to excavation, excavators verify they are at the correct location and verify locate markings and, to the best of their ability, check for unmarked facilities.

Practice Description: Upon arrival at the excavation site prior to beginning the excavation, verify that the dig site matches the one-call request and is timely. Verify that all facilities have been marked, reviewing color codes if in doubt. Verify all service feeds from buildings and homes. Check for any visible signs of underground facilities, such as pedestals, risers, meters, and new trench lines. Check for any facilities that are not members of the one-call and contact someone to get them located. Use of a pre-excavation checklist is recommended by insurers and practiced by responsible excavating contractors.

Reference:

- Existing practice by excavators, including Pauley Construction and W.F. Wilson & Sons, Inc.

11. DOCUMENTATION OF MARKS

Practice Statement: An excavator uses dated pictures, videos, or sketches with distance from markings to fixed objects recorded, to document the actual placement of markings.

Practice Description: In most situations when underground facilities are not properly marked, excavators have no way of knowing where underground utilities are located. If locate markings are adequately documented through the use of photographs, video tape, or sketches before excavation work begins, it will be easier to resolve disputes if an underground facility is damaged due to im proper marking, failure to mark, or markings that have been moved, removed, or covered. It is important for excavators and locators to document the location of markings before excavation work begins. The primary purpose of this best practice is to avoid unnecessary litigation and expensive legal fees for all parties involved.

Reference:

- Existing practice by excavators, including Pauley Construction.

12. WORK SITE REVIEW WITH COMPANY PERSONNEL

Practice Statement: Prior to starting work, the excavator reviews the location of underground facilities with site personnel.

Practice Description: Sharing information and safety issues during an on-site meeting between the excavator and his excavating crews will help to avoid confusion and needless damage to underground facilities.

Reference:

- Existing practice by excavators, including Pauley Construction, A&L Underground, W.F. Wilson & Sons, Inc.

13. ONE-CALL REFERENCE NUMBER AT SITE

Practice Statement: The excavator's designated competent person at each job site has the one-call ticket number.

Practice Description: This serves as constant reminder that all excavators will be required to call the one-call center to request a locate before they start excavation. If a representative for the facility owner/operator sees work being conducted and is unaware of the work being done, he/she can 1) stop and verify that the excavator does indeed have a valid ticket number or 2) check the third-party locator's work. If an excavator is found working without a valid one call ticket number, he/she should be requested to stop work immediately and appropriate actions should be taken. Another positive aspect of this practice will be that it should speed up the notification process back to the one-call center should the excavator find a facility incorrectly marked or not marked at all. Requiring personnel at the job site to have this number should minimize or eliminate calls to a supervisor, foreman, dispatcher, or other personnel to find the correct number if a problem is encountered. When multiple crews are working on the same project at separate locations, each crew should be responsible for having a designated competent person responsible for having this one-call ticket number in their possession.

References:

- Existing practices by excavators, including Pauley Construction and W.F. Wilson & Sons, Inc.

- Existing practices by facility owners/operators, including Ameritech.

14. CONTACT NAMES AND NUMBERS

Practice Statement: The excavator's designated competent person at each job site has access to the names and phone numbers of all facility owner/operator contacts and the one-call center.

Practice Description: Situations arise on the job site that require immediate notification of the facility owner/operator, one-call center or local emergency personnel. To avoid costly delays, the excavator ensures the designated job site personnel have all appropriate names and phone numbers. If telephone communication is unavailable, radio communication to the "home office" is available so that timely notification can be made. The "home office" also has immediate access to all appropriate names and telephone numbers.

Reference:

- Existing state regulations, including Michigan DOT.

15. FACILITY AVOIDANCE

Practice Statement: The excavator uses reasonable care to avoid damaging underground facilities. The excavator plans the excavation so as to avoid damage or minimize interference with the underground facilities in or near the work area.

Practice Description: Foremost on any construction project is safety. Excavators using caution around underground facilities significantly contribute to safe excavation of existing facilities.

Reference:

- Existing state laws, including Kansas, Ohio, West Virginia and others.

5.6.3 On-Going Excavation

16. FEDERAL AND STATE REGULATIONS

Practice Statement: The excavator adheres to all applicable federal and state safety regulations, which includes training as it relates to the protection of underground facilities.

Practice Description: Although most existing state damage prevention legislation does not include reference to federal and state regulations, it is important to include reference to worker safety and training in the best practices. Excavators are required to comply with federal and state occupational safety and health requirements to protect employees from injury and illness. These regulations include reference to training each employee in how to recognize and avoid unsafe conditions and the regulations applicable to his/her work environment to control or eliminate any hazards or exposures to illness or injury. Therefore, the excavator's crew, as part of its safety training, is informed of the best practices and regulations applicable to the protection of underground facilities.

References:

- Required by federal and state law.
- Existing practice by excavators and facility owners/operators.

17. MARKING PRESERVATION

Practice Statement: The excavator protects and preserves the staking, marking, or other designations for underground facilities until no longer required for proper and safe excavation. The excavator stops excavating and notifies the one-call center for re-marks if any facility mark is removed or no longer visible.

Practice Description: During long complex projects, the marks for underground facilities may need to be in place far longer than the locating method is durable. Paint, staking and other marking techniques last only as long as the weather and other variables allow. When a mark is no longer visible, but work continues around the facility, the excavator requests a re-mark to ensure the protection of the facility.

Reference:

- Existing state law, including Ohio.

18. EXCAVATION OBSERVER

Practice Statement: The excavator has an observer to assist the equipment operator when operating excavation equipment around known underground facilities.

Practice Description: The observer is a worker who is watching the excavation activity to warn the equipment operator while excavating around a utility to prevent damaging that buried facility. This is common practice among excavators and large facility owners operators. Further, some state laws suggest the same, for example, Ohio law.

References:

- Existing state law, including Ohio.
- Existing practice among large facility owners/operators, including Southern Natural Gas, Bell South, and Columbia Gas.

19. EXCAVATION TOLERANCE ZONE

Practice Statement: 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 requirements that currently specify more than 18".

Practice Description: (See Practice Description for #20 below.)

References:

- Existing state laws, including New Mexico, Pennsylvania, South Dakota and others.
- Telecommunications Industry Association and Electronic Industry Association (TIA/EIA), "Standard for Physical Location and Protection of Below-Ground Fiber Optic Cable Plant" (ANSI/TIA/EIA-590-A-1996).
- American Public Works Association (APWA), "Guidelines for Uniform Temporary Marking of Underground Facilities."

20. EXCAVATION WITHIN TOLERANCE ZONE

Practice Statement: When excavation is to take place within the specified tolerance zone, the excavator exercises such reasonable care as may be necessary for the protection of any underground facility in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include: hand digging when practical (pot holing), soft digging, vacuum excavation methods, pneumatic hand tools, other mechanical methods with the approval of the facility owner/operator, or other technical methods that may be developed. Hand digging and non-invasive methods are not required for pavement removal.

Practice Description: Safe, prudent, non-evasive methods that manually determine a facility are considered "safe excavation practices" in a majority of state laws (38 states). A majority of states outline safe excavation practices to include hand digging or pot holing (16 states). Some states specifically allow for the use of power excavating equipment for the removal of pavement. Each state must take differing geologic conditions and weather related factors into consideration when recommending types of excavation within the tolerance zone.

Reference:

- Existing state laws, including Arizona, New Hampshire, Pennsylvania and others.

21. MIS-MARKED FACILITIES

Practice Statement: The excavator notifies the facility owner/operator directly or through the one-call system if an underground facility is not found where one has been marked or if an unmarked underground facility is found. Following this notification, the excavator may continue work if the excavation can be performed without damaging the facility, unless specified otherwise in state law.

Practice Description: When an excavator finds an unmarked or inaccurately marked facility, excavation stops in the vicinity of the facility and notification takes place. If excavation continues, the excavator plans the excavation to avoid damage and interference with other facilities and protects facilities from damage.

References:

- Existing state/local laws, including Arizona.
- Existing practice among excavators, including W.F. Wilson & Sons, Inc.

22. EXPOSED FACILITY PROTECTION

Practice Statement: Excavators support and protect exposed underground facilities from damage.

Practice Description: Protection of exposed underground facilities is as important as preventing damage to the facility when digging around the utility. Protecting exposed underground facilities helps to insure that the utility is not damaged and at the same time protect employees working in the vicinity of the exposed facility.

Exposed facilities can shift, separate, or be damaged when they are no longer supported or protected by the soil around them. Excavators support or brace exposed facilities and protect them from moving or shifting which could result in damage to the facility. This can be accomplished in different ways, for example, by shoring the facility from below or by providing a timber support with hangers across the top of an excavation to insure that the facility does not move or bend. In addition, workers are instructed not to climb on, strike, or attempt to move exposed facilities which could damage protective coatings, bend conduit, separate pipe joints, damage cable insulation, damage fiber optics, or in some way affect the integrity of the facility.

The Occupational Safety and Health Administration (OSHA) has also addressed this issue in Subpart P - Excavation Standard 29 CFR 1926.651(b)(4) which states: "While the excavation is open, underground installations shall be protected, supported, or removed as necessary to safeguard employees." For example, an unsupported sewer main could shift causing the pipe joints to separate which could result in the trench where employees are working to flood, endangering the safety of employees.

Reference:

- Existing state/local laws, including Washington, DC, Idaho, Utah, Arizona, Virginia, Pennsylvania, New York and others.

23. LOCATE REQUEST UPDATES

Practice Statement: The excavator calls the one-call center to refresh the ticket when excavation continues past the life of the ticket (some times, but not always, defined by state law). This recognizes that it is a best practice to define ticket life. If not currently defined in state law, ticket life would best be 10 working days but not to exceed 20 working days.

Practice Description: Refreshing the ticket recognizes that markings are temporary and provides notification to facility owners/operators of ongoing excavation when a job is started but not completed as planned. Any excavation not begun during the life of the ticket is recalled to the one-call center. Any excavation that covers a large area and will progress from one area to the next over a period of time is broken into segments when notifying the one-call center in order to coordinate the marking with actual excavation. The possibility exists that new facilities have been installed in the area where the excavation is to be conducted after the original notification and marking. This practice also helps in situations where multiple excavators are working in the same area at essentially the same time. An example of when this can occur is when two facility owners, such as a cable television company and the telephone company, are planning to serve a new section of a subdivision. In their pre-planning process, they see a vacant space in the right-of-way to place their new facility. Each excavator (internal or external) calls the one-call center for locates and each facility owner/operator comes and marks their respective facilities indicating that nothing exists. For one reason or another, one of the excavators gets delayed and does not start construction as planned, and when returning to the job site to place the new facility, finds new lines have been installed in the previously vacant space. Many facility owners/operators do not perform their own locates and utilize the services of a contracted facility locator.

These contracted facility locators may not be aware of work planned in the near future. By excavators refreshing the locate ticket, the contract locator has another opportunity to identify newly placed facilities. This practice also gives the facility owner/operator another chance to identify the location of their facilities and to avoid a possible damage and disruption of service should something have been marked incorrectly or missed on a previous locate.

Reference:

- Existing state laws that specify 10 working days include Kansas, Ohio, Wisconsin, Pennsylvania, and Texas. Existing state laws that specify 15 working days include Virginia and Tennessee.

24. FACILITY DAMAGE NOTIFICATION

Practice Statement: An excavator discovering or causing damage to underground facilities notifies the facility owner/operator and the one-call center. All breaks, leaks, nicks, dents, gouges, groves, or other damages to facility lines, conduits, coatings or cathodic protection will be reported.

Practice Description: A majority of states require notification for damage or substantial weakening of an underground facility (27 states). The possibility of facility failure or endangerment of the surrounding population dramatically increases when a facility has been damaged. While the facility may not immediately fail, the underground facility owner/operator should have the opportunity to inspect the damage and make appropriate repairs.

Reference:

- Existing state laws, including Arkansas, Idaho, Maryland and others.

25. NOTIFICATION OF EMERGENCY PERSONNEL

Practice Statement: If the damage results in the escape of any flammable, toxic, or corrosive gas or liquid or endangers life, health, or property, the excavator responsible immediately notifies 911 and the facility owner/operator.[15] The excavator takes reasonable measures to protect themselves and those in immediate danger, general public, property, and the environment until the facility owner operator or emergency responders have arrived and completed their assessment.[16]

Practice Description: This practice is already required by many of the states' one-call legislation. This practice minimizes the danger to life, health or property by notifying the proper authorities to handle the emergency situation. In these situations, local authorities are able to evacuate as appropriate and command substantial resources unavailable to the excavator or underground facility owner/operator. The excavator takes reasonable measures based on their knowledge, training, resources, experience and understanding of situation to protect themselves, people, property and the environment until help arrives. The excavator responsible remains on site to convey any pertinent information to responders that may help them to safely mitigate the situation.[17]

Reference:

- Existing state laws, including Kansas, Ohio, Oregon and Minnesota

26. EMERGENCY EXCAVATION

Practice Statement: In the case of an emergency excavation, maintenance or repairs may be made immediately provided that the excavator notifies the one-call center and facility owner/operator as soon as reasonably possible. This includes situations that involve danger to life, health or property, or that require immediate correction in order to continue the operation of or to assure the continuity of public utility service or public transportation.

Practice Description: This allows excavation to begin immediately to restore service or stop a hazardous situation from getting worse in

15 TR-2001-02A: Amendment Approved by CGA Board on November 30, 2001
16 TR-2001-02B: Amendment Approved by CGA Board on September 27, 2002
17 TR-2001-02B: Amendment Approved by CGA Board on September 27, 2002

the case of gas or pipeline leak, telephone cable cut, or other facility damage.

Reference:

- Existing state laws, including Colorado, Nevada, West Virginia and others. (Number of participating states or one-calls = 49.)

27. BACKFILLING

Practice Statement: The excavator protects all facilities from damage when backfilling an excavation. Trash, debris, coiled wire, or other material that could damage existing facilities or interfere with the accuracy of future locates are not to be buried in the excavation.

Practice Description: Extra caution must be taken to remove large rocks, sharp objects, and large chunks of hard packed clay or dirt. No trash or pieces of abandoned lines are backfilled into the trench. This will avoid any inadvertent damage to the facility during the backfill process.

References:

- Michigan DOT specification.
- Existing insurance carrier guidelines.

5.6.4 Restoration/Completion

28. AS-BUILT DOCUMENTATION

Practice Statement: Contractors installing underground facilities notify the facility owner/operator if the actual placement is different from expected placement.

Practice Description: In order for a facility owner/operator to maintain accurate records of the location of their facilities, it is critical that the contractor installing the new facility be required to notify the facility owner/operator of deviations to the planned installation. Some facility owners/operators do not require a full time inspector and use a sampling process to insure the new facilities are being installed correctly and in adherence to the specifications. When this occurs, it becomes much more critical for the contractor to notify the facility owner/operator of changes. For example, it is common for the contractor to make adjustments in the location of the new facilities when rocks or other underground obstructions are encountered or the location of the new facility conflicts with another existing underground facility. This change in plan can be both changes in horizontal or vertical distances from the specified plans. The facility owner/operator should establish standards that require notification if a deviation is beyond specified tolerances, such as changes in depth of 6 inches or more and lateral measurement changes of greater than 1 foot. Once these changes to the expected location are communicated to the facility owner/operator, it is their responsibility to take appropriate action to update their records so that an accurate locate can be conducted in the future.

Reference:

- Existing operating practice among facility operators, including Ameritech, Sprint, Columbia Gas and others.

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Mapping Practices

A decision was made by the Mapping Team to look at mapping practices from the viewpoint of the different areas represented by the Team members. Therefore, the best practices for mapping are listed in five distinct areas: One-Call Center, Locator, Excavator, Facility Owner/Operator, and Project Owner. By consensus of the Mapping Task Team, all of the findings listed below are best practices.

One-Call Center

A one-call center uses an electronic mapping database system that includes the following:

1. The land base should be accurate.
   Accuracy - The land base is the most precise geographical information available to the center. The one-call centers in the following states follow this practice: Arizona, Minnesota, North Carolina, Texas, and Wisconsin.
2. The land base and database uses latitude/longitude.
   Latitude/Longitude (Lat/Long) - The land base and database are able to produce Lat/Long information based upon street address, street/road name, intersection, milepost marker, etc. It is also possible to determine the street address, street/road name, intersection or milepost based upon Lat/Long information. The translation of Lat/Long information is automatic. A map point (i.e., a rural area not in the immediate vicinity of a road or known map landmark) can be identified by Lat/Long information. The one-call centers in the following states follow this practice: Ohio, South Dakota, New Jersey, Missouri, and Tennessee.
3. The land base is up-to-date.
   The land base is kept up-to-date, including a process that periodically adds new street information, name changes, aliases, and municipal boundaries. The one-call centers in the following states follow this practice: Arizona, Ohio, and New Jersey.
4. The database is updated by information from facility owners/operators.
   The database is promptly updated as information is provided or becomes available from the facility owner/operator. The system is able to accept information in standard file format with minimal human intervention. The one-call centers in the following states follow this practice: Arizona, North Carolina, Ohio, New Jersey, and Wisconsin.
5. The electronic mapping system can produce a ticket for the smallest practical geographical area.
   Location Area - The electronic mapping system is able to produce a ticket for the smallest practical geographical area. The one-call centers in the following states follow this practice: Arizona, Tennessee, Minnesota, Oregon, and Wisconsin.
6. The land base is available to the public.
   Availability - The land base is available to the public for the identification of the excavation area. The land base and database are available to the one-call center membership for the update of member database information. The one-call centers in the following states follow this practice: North Carolina, Ohio, and South Dakota.

Locator

Locators use maps to assist in finding the excavation site and to assist in determining the general location of the buried facility.

7. Locators are trained in map reading and symbology.
   Locators are trained in map reading and symbology to assist in determining the location of the buried facility. The following association trains its members to carry out this practice: NULCA.
8. The locator provides precise facility location to the facility owner/operator when there is a discrepancy.

The locator provides to the facility owner/operator the most precise facility location information obtained from a locate when there is a discrepancy. The following state carries out this practice: Arizona Blue Stake law.

9. The locator supplies feedback to the one-call center.
   The locator provides feedback to the one-call center on land base mapping and location discrepancies. The following states carry out this practice: Ohio, Tennessee, and North Carolina.

Excavator

10. The excavator provides accurate location information to the one-call center. The excavator takes responsibility for giving accurate location information to the one-call center. This information includes street address, street intersection, legal description, or other acceptable one-call format and latitude/longitude if feasible.
11. The excavator provides basic attributes to the one-call center.
    The excavator provides a starting point and ending point, and on which side of the property (North, South, East, West, front, back, rear, sides, etc.) or street the excavation area is located.
    If the excavator can not meet the above criteria, the excavator directly coordinates with the one-call center to establish the excavation area.
    References:
    • Michaels Pipeline Company, Brownsville, Wisconsin.
    • Hooper Corporation, Pewaukee, Wisconsin.
    • Intercon Construction, Madison, Wisconsin.

Facility Owner/Operator

12. The facility owner/operator provides mapping data to the one-call center.
    The facility owner/operator provides the one-call center with data that will allow proper notification of excavation activities near the facility owner/operators' infrastructure. Facility owners/operators in all mandatory one-call states follow this practice.
13. The facility owner/operator provides mapping data access.
    The facility owner/operator provides access to a mapping system that can be utilized by both the locator and the facility owner/operator. The following facility owners/operators follow this practice: Atlanta Gas Light, Sprint Long Distance, AT&T, Questar Regulated Services.
14. Mapping standards are adhered to.
    The facility owner/operator requires the designer to adhere to the facility owner/operator's mapping standards. The following facility owners/operators follow this practice: AT&T, Sprint Long Distance.
15. Consistent, current information is provided to the one-call center.
    The facility owner/operator provides consistent, current information to the one-call center for the proper receipt of ticket notification. Basic information should include latitude and longitude and should be tied to a physical attribute where available, such as milepost marker. The following facility owner/operator follows this practice: Sprint Long Distance.
16. Detailed mapping information is collected.
    The facility owner/operator captures the following information to ensure project safety in the plan, design, construction, documentation, location, and maintenance of their longitudinal utility.
    1. Any new construction into the electronic mapping database at the time of installation
    2. The location of abandoned or sold facilities is retained in the database.
    3. The electronic mapping database includes the following detailed information:
       a. Engineering stationing and milepost/marker post location, with latitude and longitude. Common mapping coordinate systems that allow conversion to latitude and longitude are used.

b. Alignment of the utility with engineering stationing at each running line change or PI (point of inflection) including signs and markers.
c. Bridges, culverts and rivers.
d. All road crossings, overhead viaducts and underpasses, including name of the street (public or private) and mile marker/marker post designation.
e. Small scale maps showing the overall utility route.
f. Physical characteristics and attributes of the system such as: pedestal, pole, transformer, meter numbers, anode bed, size, material, product and pressure.
g. The number of utility lines or conduits owned by the facility owner/operator in a corridor or the size of the duct package bank.

This is universally a general practice of major pipe line and long distance telecommunication operators and railroads.

Project Owner

17. The project owner provides accurate information.
The project owner provides the excavator with accurate location information on the proposed excavation area using mapping information utilized by the one-call center. This information includes: a street address, street intersection, legal description, or other acceptable one-call format and latitude/longitude if feasible.
18. The project owner determines basic coordinates.
The project owner determines a starting point, ending point and on which side of the property (North, South, East, West, front, back, rear, sides, etc.) or street the excavation area is located.
Reference:
    - These are general practices of the State DOTs on Highway projects.
    - These are general practices of most NUCA members. The references listed in each best practice are not all inclusive.

Emerging Technologies

Technology is rapidly changing. Many of the best practices identified in this chapter could be obsolete in the near future. Although the following technologies are now used in other applications, their use is not widespread in the damage prevention field.

- Geographic Information System (GIS)
- Advances in Location Technology
- The Global Positioning System (GPS)
- Orthographic and Satellite Images

GIS allows the integration of digital maps with other databases to view the relationship of physical features, conducts relational queries, and obtains additional information on a particular feature. The GIS infrastructure or base will support all of the advanced technologies of GPS, Ortho and Satellite Images.

Combining Orthographic and Satellite images with an overlay of a line map, street names, addresses and GPS coordinates of utility lines will allow one-call centers, excavators, locators, facility owners/operators, and project owners to view the accurate and relative location of utility lines.

Advanced use of these technologies in combination with advances to locating technologies is expected to reduce damage to underground facilities.

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Compliance Best Practices

1. **PUBLIC AND ENFORCEMENT EDUCATION**
   A. Public Education
   Practice Statement: Public education programs are used to promote compliance.
   Practice Description: A single entity is charged to promote comprehensive and appropriate programs to educate all stake holders about the existence and content of the damage prevention laws and regulations. This is not meant to discourage individual stakeholders from providing educational programs.
   Reference:
   New York: "Each one-call notification system shall perform the following duties: ...(b) Conduct a continuing program to: (1) Inform excavators of the one-call notification system's existence and purpose and their responsibility to notify the one-call notification system of proposed excavation and demolition and to protect underground facilities. (2) Inform operators of the responsibility to participate in the one-call notification system, to respond to a notice relating to a proposed excavation and demolition and to designate and mark facilities according to the provisions of this Part." New York Code, 16 NYCRR Part 753, § 753-5.3(b)(1)-(2).

   B. Enforcement Education
   Practice Statement: Mandatory education is considered as an alternative or supplement to penalties for offenders of the damage prevention laws and regulations.
   Practice Description: Once a violation of the damage prevention laws or regulations has occurred, mandatory education is an effective alternative or supplement to civil penalties. Mandatory education as an enforcement tool promotes compliance with damage prevention laws and regulations.
   References:
   - Arizona: "When a notice of violation (N.O.V.) is issued, the following may be followed: 1. First Time Offenders: A. May be given a warning letter and Item C below...C. Given the opportunity to attend Blue Stake Training Course provided by the Arizona Corporation Commission's Pipeline Safety Section." Arizona Corporation Commission policy, "Notice of Violation," § 1(A) and (C).
   - New Hampshire: "Any excavator or operator who does not comply with RSA 374:51-54 shall be required on first offense to go through either a Digsafe training program or be subject to a civil penalty..." New Hampshire Code, RSA 374, § 374:55(VIII).

2. **INCENTIVES**
   Practice Statement: Damage prevention programs include incentives to promote compliance with laws and regulations.
   Practice Description: Incentives can include, but are not limited to, ease of access to one-call system, membership and participation considerations, representation on one-call boards, reasonable enforcement of regulations, safety and liability protection, access to alternative dispute resolution (ADR), and public education.
   Incentive - Membership: Membership facilitates communication between an excavator and facility owner/operator, which helps prevent damage to underground facilities.
   References:
   - Arizona: "If the owner or operator fails to locate or incorrectly locates the underground facility, pursuant to this article, the owner or operator becomes liable for resulting damages, costs and expenses to the injured party." Arizona Code, Article 6.3, § 40- 360.27(C).
   - Minnesota: "Reimbursement is not required if the damage to the underground facility was caused by the sole negligence of the

operator or the operator failed to comply with section 216.04, subdivision 3." Minnesota Code, Chapter 216D.06, Subd. 2(b).

- Pennsylvania: Stakeholders who do not join the one-call system in violation of state law are not permitted to recover damages for injury to their property: "If a facility owner fails to become a member of a One Call System in violation of this act and a line or lines of such nonmember facility owner are damaged by a contractor by reason of the contractor's failure to notify the facility owner because the facility was not a member of a One-Call System serving the location where the damage occurred, such facility owner shall have no right of recovery from the contractor of any costs associated with the damage to its lines. The right herein granted shall not be in limitation of any other rights of the contractor." Pennsylvania Code, 73 P.S. § 176 et. seq., Section 2(9).

Incentive - Membership Accommodations: To avoid cost being a barrier to membership, several states have made membership accommodations for smaller municipals and authorities.

References:

- Arizona: "Each one-call notification center shall establish a limited basis participation membership option, which may be made available to all members, but which must be made available for any member serving less than one thousand customers or any member irrigation or electrical district. A facility owner who elects limited basis participation membership will provide to the one-call center the location of its underground facilities by identifying the incorporated cities and towns, or for unincorporated county areas, by identifying the townships, in which it has facilities. The service level provided to the limited basis participation members by the one-call notification center is limited to providing excavators with names and telephone numbers the excavator should contact to obtain facilities location. Each one-call center shall establish fair and reasonable fees for limited basis participation members, based on customer count, areas occupied or miles of underground facilities." Arizona Code, Article 6.3, § 40-360.32. *Note, Arizona's system somewhat defeats the purpose of "one-call", but is successful because the Arizona Blue Stake, the one-call center, goes the extra mile to assist the excavator in contacting the small facility owners, many of which do not have a manned telephone line.
- Minnesota: The Gopher State One-Call Center instituted a no locate-required policy, which credits the facility operator those charges for "not-involved" tickets. It results in cost savings to the facility owners/operators because one-call membership rates are based on the number of tickets received by the facility owners operators.
- New York: "3. Costs. The costs of operating the system shall be apportioned equitably among the members of the system, with the exception of municipalities and authorities that operate underground facilities and any operator of underground facilities that provides water service to less than four thousand customers. In apportioning such costs, the system shall take into account the number of customers, extent of underground facilities and frequency of use." New York General Business Law Article 36, § 761.
- Pennsylvania: "Operation costs for the One Call System shall be shared, in an equitable manner for services received, by facility owner members as determined by a One Call System's board of directors. Political subdivisions with a population of less than two thousand persons or municipal authorities having an aggregate population in the area served by the municipal authority of less than five thousand persons shall be exempt from payment of any service fee." Pennsylvania Code, 73 P.S. § 176 et. seq., Section 2(8).

Incentive - One-Call Center Board of Directors: Boards are composed of representatives of all stakeholders. Representation of all stake holders in the governance of the one-call system (although not necessarily in the administration of the one-call center) assures that the viewpoint of all stakeholders will be considered in the policies and programs of the one-call system.

References:

- Minnesota: "The nonprofit corporation must be governed by a board of directors of up to 20 members, one of whom is the director of the office of pipeline safety. The other board members must represent and be elected by operators, excavators, and other persons eligible to participate in the center..." Minnesota Code, Chapter 216D.03, Subd. 2(a).
- Pennsylvania: "A one-call system shall be governed by a board of directors, to be chosen by the facility owners. No less than twenty percent of the seats shall be held by municipalities or municipal authorities. The board shall include the following: (1) The Chairman of the Pennsylvania Public Utility Commission or his designee. (2) The Director of the Pennsylvania Emergency Management Agency or his designee. (3) The Secretary of Labor and Industry or his designee. (4) The Secretary of Transportation or his designee. (5) A contractor or industry representative. (6) A designer or industry representative." Pennsylvania Code, 73 P.S. § 176 et. seq., Section 7.1(b).

Incentive - Safety and Liability Protection: Compliance with one-call system requirements promotes worker safety, public safety and reduces exposure to liability.

References:

- New York: "The penalties provided for by this article shall not apply to an excavator who damages an underground facility due to the failure of the operator to comply with any of the provisions of this article nor shall in such instance the excavator be liable for repairs as prescribed in subdivision four of this section." New York Code, 16 NYCRR Part 753, § 765(b).
- Pennsylvania: "The designer who has complied with the terms of this act and who was not otherwise negligent shall not be subject to liability or incur any obligation to facility owners, operators, owners or other persons who sustain injury to person or property as a result of the excavation or demolition planning work of the designer." Pennsylvania Code, 73 P.S. § 176 et. seq., Section 3(7).

Incentive - Reasonable Enforcement of Regulations: Reasonable enforcement of regulations refers to actions by enforcement authority officials and enforcement processes, both of which aim to fairly arrive at rational outcomes, such as education and penalties that correspond to the gravity of the violation, without imposing unnecessarily high transaction costs on any participant, including the enforcement authority.

Reference:

- In Massachusetts, a state where a violator's "history" is considered when addressing a violation, repeat offenders of the one-call law can attain first-time offender status if they demonstrate compliance for a solid year. "Any person, contractor, excavator or company found by the Department to have violated any provision of the Dig Safe law or regulation adopted by the Department thereunder shall be subject to a civil penalty not to exceed $500 for the first offense and not less than $1,000 nor more than $5,000 for any subsequent offense within a 12 month period after the Department issues a remedial order or executes a consent order for the first offense. Any excavator whose subsequent violation occurs after 12 consecutive months of no violations shall be subject to a civil penalty of $500." Massachusetts Regulation, 220 C.M.R. §99.12(1).

3. PENALTIES

Practice Statement: Compliance programs include penalties for violations of the damage prevention laws or regulations.

Practice Description: Within the context of one-call statutes, there exists specific provisions for penalties for failure to comply with the damage prevention laws and regulations. Performance and penalty incentives are equitably administered among stakeholders subject to one-call provisions.

A penalty system includes education as an alternative or supplement to civil or other penalties.

Reference:

- New Hampshire: _Any excavator or operator who does not comply with RSA 374:51-54 shall be required on first offense to go through either a 'Digsafe' training program or be subject to a civil penalty..." New Hampshire Code, RSA 374, § 374:55(VIII).

A penalty system also uses a tiered structure to distinguish violations by the level of severity or repeat offenses (e.g., warning letters, mandatory education, civil penalty amounts).

References:

- Arizona: "When a notice of violation (N.O.V.) is issued, the following may be followed: 1. First Time Offenders: A. May be given a warning and Item C below or B. May be fined $250 per violation and C. Given the opportunity to attend a Blue Stake Training Course provided by the Arizona Corporation Commission's Pipeline Safety Section. Note: The investigator may use the N.O.V. as a warning, if they feel a warning would suffice. 2. Second Offense: A. May be fined $250 per violation and B. Given the opportunity to attend a Blue Stake Training Course provided by the Arizona Corporation Commission Pipeline Safety Section. 3. Repeat Offenders: A. Third Time: May be fined $500 per violation. B. Four or More Times: Could be fined up to $2000 per violation. Flagrancy or magnitude of offense could cause pipeline safety to deviate from this policy. Any deviation to the above-state police will jointly be determined by the Chief of Pipeline Safety and the Investigator." Arizona Corporation Commission policy, "Notice of Violation," section 1-3.
- New York: "Warning letters: Upon determining that a probable violation(s) of a provision of Part 753 has occurred or is continuing, the Department may issue a warning letter notifying the Respondent of the probable violation and advising him or her to correct it, if it is correctable, and to comply henceforth, or be subject to enforcement actions under this Part." NY Public Service Commission policy (proposed code § 753-6.3).

A penalty system also establishes mitigating and aggravating factors for determining the penalty for a violation by statute or regulation.

References:

- Massachusetts: "In determining the amount of the civil penalty, the Department shall consider the nature, circumstances and gravity of the violation; the degree of the respondent's culpability; the respondent's history of prior offenses; and the respondent's level of cooperation with the requirements of this regulation." Massachusetts Regulation, 220 C.M.R. §99.12(2).
- Minnesota: "In assessing a civil penalty under this part, the office shall consider the following factors: A. the nature, circumstances, and gravity of the violation; B. the degree of the person's culpability; C. the person's history of previous offenses; D. the person's ability to pay; E. good faith on the part of the person in attempting to remedy the cause of the violation; F. the effect of the penalty on the person's ability to continue business; and G. past reports of damage to an underground facility by a person." Minnesota Rules, 7560.0800, Subpart 3.
- New Hampshire: _In determining the assessment, the following factors shall be considered: (1) Severity of the consequences resulting from the violation: the more severe the consequences, the higher the civil penalty; (2) Mitigating circumstances: i.e., how

quickly actions were taken to rectify the situation, how much control the company had over the situation, and other circumstance which would tend to less fault; and (3) Prior violations of Puc 800." New Hampshire Regulation, Chapter Puc 800, § Puc 805.06(b)(1)-(3).

- New York: "...the commission shall determine the amount of the penalty after consideration of the nature, circumstances and gravity of the violation, history of prior violations, effect on public health, safety or welfare, and such other matters as may be required and shall send a copy of its determination to the excavator, operator, commissioner of labor and attorney general." New York Public Service Law, § 119-b(8).
- Virginia: "In determining the amount of any civil penalty included in a settlement, the nature, circumstances and gravity of the violation; the degree of the Respondent's culpability; the Respondent's history of prior offenses; and such other factors as may be appropriate shall be considered." Virginia "Rules for Enforcement of the Underground Utility Damage Prevention Act," § 6.

A penalty system does not allow any violator or class of violators to be shielded from the consequences of a violation (i.e., all stake-holders should be accountable).

Reference:

- New Hampshire: "Any excavator or operator who does not comply with RSA 374:51-54 shall be required on first offense to go through either a 'Digsafe' training program or be subject to a civil penalty..." New Hampshire Code, RSA 374, § 374:55(VIII).

4. DAMAGE RECOVERY

Practice Statement: State damage prevention laws and regulations recognize the right to recover damages and costs resulting from non compliance.

A. Right of Recovery

Practice Description: The statute recognizes an injured party's right to recovery when damages and/or costs are incurred as the direct result of an entity's failure to comply with the one-call laws and regulations. For example, Arizona endorses an injured party's right to recover damages when the other party has failed to comply with the one-call law.

References:

- Arizona: "If an underground facility is damaged by any person as a result of failing to obtain information as to its location, failing to take measures for protection of the facilities or failing to excavate in a careful and prudent manner as required by this article, the person is liable to the owner of the underground facility for the total cost of the repair of the facility." Arizona Code, Article 6.3, § 40-360.26(A).
- Arizona: "If the owner or operator fails to locate or incorrectly locates the underground facility, pursuant to this article, the owner or operator becomes liable for resulting damages, costs and expenses to the injured party." Arizona Code, Article 6.3, § 40-360.28(C).

B. Alternative Dispute Resolution

Practice Description: Avenues for settlement of disputes include alternative dispute resolution. Minnesota endorses ADR through the state court system, New Jersey endorses ADR in construction contract documents, and the federal government endorses ADR through the federal courts.

References:

- Minnesota: "The Supreme Court shall establish a statewide alternative dispute resolution program for the resolution of civil cases filed with the courts. The supreme court shall adopt rules governing practice, procedure, and jurisdiction for alternative dispute resolution programs established under this section. Except for matters involving family law the rules shall require the use of nonbinding alternative dispute resolution processes in all

civil cases, except for good cause shown by the presiding judge, and must provide an equitable means for the payment of fees and expenses for the use of alternative dispute resolution processes." Minnesota Code, Chapter Title: District Courts, § 484.76.

- New Jersey: "All construction contract documents entered into in accordance with the provisions of P.L. 1971, c. 198 (C.40A:11-1 et seq.) after the effective date of P.L. 1997, c.371 (C.40A:11-50) shall provide that disputes arising under the contract shall be submitted to a process of resolution pursuant to alternative dispute resolution practices, such as mediation, binding arbitration or non-binding arbitration pursuant to industry standards, prior to being submitted to a court for adjudication. Nothing in this section shall prevent the contracting unit from seeking injunctive or declaratory relief in court at any time. The alternative dispute resolution practices required by this section shall not apply to disputes concerning the bid solicitation or award process, or to the formation of contracts or subcontracts to be entered into pursuant to P.L. 1971, c. 198 (C.40A:11-1 et seq.)." New Jersey Code, Title 40A, § 40A-11-50.
- Federal: "Congress finds that— (1) alternative dispute resolution, when supported by the bench and bar, and utilizing properly trained neutrals in a program adequately administered by the court, has the potential to provide a variety of benefits, including greater satisfaction of the parties, innovative methods of resolving disputes, and greater efficiency in achieving settlements; (2) certain forms of alternative dispute resolution, including mediation, early neutral evaluation, minitrials, and voluntary arbitration, may have potential to reduce the large backlog of cases now pending in some federal courts throughout the United States, thereby allowing the courts to process their remaining cases more efficiently; and (3) the continued growth of Federal appellate court-annexed mediation programs suggests that this form of alternative dispute resolution can be equally effective in resolving disputes in the federal trial courts; therefore, the district courts should consider including mediation in their local alternative dispute resolution programs...Each United States district court shall authorize, by local rule adopted under section 2071(b) 2071(a), the use of alternative dispute resolution processes in all civil actions, including adversary proceedings in bankruptcy, in accordance with this chapter, except that the use of arbitration may be authorized only as provided in section 654 [(1) the action is based on an alleged violation of a right secured by the Constitution of the United States; (2) jurisdiction is based in whole or in part on section 1343 of this title; or (3) the relief sought consists of money damages in an amount greater than $150,000.]." Alternative Dispute Resolution Act of 1998, enacted October 1998.

5. ENFORCEMENT

A. Authority

Practice Statement: An authority is specified through state statutes and given the resources to enforce the law.

Practice Description: The enforcement authority in each state has the resources to enforce the laws and regulations. Experience has demonstrated that enforcement of the one-call laws and regulations that did not identify a specific authority other than the attorney general has not been effective.

Characteristics of such an authority include:

- a process for receiving reports of violations from any stakeholder;
- an operating budget source other than fine revenue, such as a line item in the state budget, excluding fines as a source of income for the authority;
- stakeholder involvement in periodic review and modification of enforcement processes;
- resources to respond to notifications of alleged violations in a timely manner;

- a method of investigating alleged violations prior to issuing a notice of probable violation;
- impartial authority adjudicating violations;
- an initial informal means of contesting a notice of violation; and
- a published violation review process and violation assessment considerations.

References:

- Arizona: The Pipeline Safety Division of the Arizona Corporation Commission is funded by the Commission budget. "Any penalties received by the state shall be deposited in the general fund." Arizona Code, Article 6.3, § 40-360.28.
- Massachusetts: "... Any other person may report a suspected violation of M.G.L. c. 82 s. 40 to the Department. All such reports shall be in a form deemed appropriate and necessary by the Department." Massachusetts Regulation, 220 C.M.R. §99.01(1).
- Massachusetts: The Massachusetts Department of Telecommunications and Energy investigates all complaints received from excavators and facility owners/operators and conducts random field investigations. The Department then issues a Notice of Probable Violation if, based on the investigation, it has reason to believe that a violation has occurred or is occurring. "The Department may begin a proceeding by issuing a notice of probable violation ("NOPV") if the Department has reason to believe that a violation of the M.G.L. c. 82, § 40, has occurred or is occurring...The NOPV shall state the factual basis for the allegation of a violation..." Massachusetts Regulation, 220 C.M.R. §99.07(1).
- Minnesota: "The office shall issue a notice of probable violation when the office has good cause to believe a violation of Minnesota Statutes, sections 216D.01 to 216.D.09 or this chapter has occurred...A notice of violation must include: A. a statement of the statute or rule allegedly violated by the person and a description of the evidence on which the allegation is based." Minnesota Rules, 7560.04000, Subp.1 - Subp. 2(A).
- Minnesota: See also Minnesota Rules, 7560.0400, Subp. 1, Notice of Violation; 7560.0500 Response Options; 7560.0600, Director Review;7560.0800 Civil Penalties; Subp. 3, Assessment considerations.
- New Hampshire: "Upon receipt of a the NOPV [Notice of Probable violation] the respondent shall either: (1) Submit in writing, within 30 days, evidence refuting the probable violation referenced in the NOPV; or (2) Request in writing within 30 days, an informal conference with commission staff to examine the basis of the violation, at which time the respondent may be represented by an attorney or other person; or (3) Waive procedural schedule by signing a consent agreement." New Hampshire Regulation, Chapter Puc 800, § Puc 805.02.
- New Hampshire: See also New Hampshire regulations, Chapter Puc 800, sections Puc 805.01, "Notice of Probable Violation"; Puc 805.02, Alternative Responses to Notice of Probable Violation; Puc 805.03, Notice of Violation; Puc 805.04, Response to Notice of Violation; Puc 805.05 Commission Action; Puc 805.06, Civil Penalties.
- Virginia: The Advisory Committee, which is established by statute to include "representatives of the following entities: Commission staff, utility operator, notification center, excavator, municipality, Virginia Department of Transportation, Board of Contractors and underground line locator," meets one day annually (in addition the monthly hearings) for "issue day," a day to discuss issues and make recommendations to the State Corporation Commission (SCC) administrative 3-judge panel on issues related to damage prevention. Subteams of the Advisory Committee are also formed to develop recommendations. "The purpose of the Committee is to ...make recommendations with regard to Public Education and Awareness Programs that further

public safety by the reduction of damage to the underground utility facilities in the Commonwealth and to monitor, analyze, influence, propose, support or oppose programs or regulations that directly affect damage to underground facilities serving the citizens of the Commonwealth." Bylaws of the Advisory Committee, Article II.

- Virginia: "Upon receipt of a report of a probable violation, the Commission Staff ("Staff") shall conduct an investigation to examine all the relevant facts regarding the reported probable violation. The investigation may include, among other things, records verification, informal meetings, teleconferences and photo-documentation. Upon completion of the investigation, the Staff shall review its findings and recommendations with the Advisory Committee established in accordance with _ 56-265.31 of the Act." Virginia "Rules for Enforcement of the Underground Damage Prevention Act," § 3.

B. Structured Review Process

Practices Statement: A structured review process is used to impartially adjudicate alleged violations.

Practice Description: Two types of review processes currently used are outlined below. These type of processes differ in terms of 1) who receives reports of alleged violations, 2) who investigates the reports, 3) possible outcomes of the investigation, 4) who conducts 1st tier (informal) hearings, 5) possible outcomes of 1st tier hearings, and 6) appeal rights following a 2nd tier (formal) hearing. It is important that review processes are constructed to avoid abuses of authority and prevent any individual, industry, stakeholder or agency from exercising undue power or influence over the process.

Type 1: Traditional Enforcement Authority - This system is currently used in Arizona, Connecticut, Massachusetts, Minnesota, New Hampshire, New Jersey, New York and Pennsylvania. Reports of alleged violations are sent to the State Agency. A state investigator investigates the reports. If the investigator decides not to issue a NOPV (Notice of Probable Violation), the matter is concluded. If not, the NOPV is issued, and the investigator conducts an informal hearing or review. If the investigator determines that no violation was committed the matter is concluded. If the investigator determines that a violation was committed, the NOV (Notice of Violation) is issued. If the alleged violator does not contest the NOV, the alleged violation is bound by the facts, findings, orders and penalties set forth in the NOV. If the alleged violator so requests, the State Agency conducts a formal hearing. The alleged violator may appeal the decision reached in the formal hearing to the state court system.

Type 2: Advisory Committee (made up of stakeholders) partnered with State Agency - This system is currently used in Virginia. Reports of alleged violations are sent to the State Enforcement Agency. The State Agency investigates the alleged violations and reports to an advisory committee. The Committee is made up of stakeholders representing the following statutorily mandated fields: excavators, facility owners/operators, notification centers, contract locators, local governments, State Department of Transportation, the Board of Contractors, and the State Enforcement Agency. If the advisory committee decides not to issue a NOPV (Notice of Probable Violation), the matter is concluded, possibly with a "letter of concern" containing one-call information. If the advisory committee decides to issue an NOPV, it is issued by the State Agency. If the alleged violator does not request a hearing, the alleged violator is bound by the enforcement action set forth in the NOPV. If the alleged violator so requests, an informal hearing is held by the advisory committee. If the advisory committee decides that no violation was committed, the matter is concluded, subject to the right of the State Agency to contest that decision in an administrative proceeding conducted by the agency. If not, the NOV is issued. If the alleged violator then settles the matter with the advisory committee, the settlement is

subject to approval by the State Agency in an administrative proceeding. If there is no settlement, the State Agency conducts a formal administrative hearing. The alleged violator may appeal the decision reached in the formal hearing to the state court system.

For additional information on the Common Ground Alliance or to learn how to become a member, visit the CGA web site at www.commongroundalliance.com.

Public Education and Awareness Best Practices

1. **USE OF A MARKETING PLAN**

Practice Statement: An effective damage prevention education program includes a comprehensive, strategic marketing/advertising plan.

Practice Description: A comprehensive, strategic marketing/advertising plan enables better implementation, control, and continuity of advertising/public relations programs and ensures the most effective and efficient use of limited resources. These plans focus on setting realistic goals and allocating sufficient resources required to achieve those goals within a specified time frame. The marketing plan is a set of action steps based on a comprehensive situation analysis that clearly states:

- What is to be achieved,
- How it will be achieved,
- When it will be achieved,
- Who is responsible for achieving each goal, and
- What amount of resources (time, people, and money) will be allocated to achieving each goal.

References:

- Louisiana One Call Systems, Inc. Project 2000, 1998 Marketing Plan.
- Public Awareness Marketing Plan for Underground Utility Damage Prevention, prepared for the Damage Prevention Quality Action Team by The Daily Planit, November 20, 1997.
- Underground Protection Center (UPC) of Georgia.
- Various one-call centers including: AL, AZ, CT, GA, IL, IA, KY, MO, NM, NY (City), NC, OK, OH, OR, WV, and WI.

2. **TARGET AUDIENCES AND NEEDS**

Practice Statement: An effective damage prevention education program includes identification of target audiences and their individual needs.

Practice Description: Identification of target audiences will ensure maximum impact for the Dig Safely message. The following target audiences have been identified as examples:

- Construction management
- Excavation equipment operators
- Excavators
- Public works excavators
- Locators
- Railroads
- Participating facility owners/operators
- Non-participating facility owners/operators (i.e., not one-call members)
- Marine operations
- Children
- Property owners/tenants
- Emergency responders/local emergency planning committees
- News media

When target audiences are identified, their specific needs can be more readily addressed. This will allow the identification of media (e.g., free advertising, advertising, brochures, meal meetings, handouts, etc.) which can most effectively be used to deliver the message. This will also allow customization of the message itself. Coordination with other strategic partners can assist in reaching the greatest number of people.

References:

- Various one-call centers including: AL, AZ, CO, CT, GA, ID, IL, IA, KY, MS, MO, NM, NY (City), NC, OK, OH, OR, TX, WV, and WI.
- NUCA and various NUCA state chapters.
- API, INGAA, and AGA member companies.
- AGC chapters.

3. **THE USE OF STRUCTURED EDUCATION PROGRAMS**

Practice Statement: An effective damage prevention education program is structured to accommodate the needs of individual audiences.

Practice Description: Damage prevention education programs that are structured to accommodate the needs of individual audiences are essential to effectively communicate the message of damage prevention for underground facilities. For example:

- Structured education presentations in association with meal functions are an effective method to communicate with organized groups such as emergency responders and equipment operators.
- Guest speaker appearances are effective with property owners groups, civic clubs, etc.
- Awareness videos are effective education tools for children's groups such as scout troops and schools.
- One-call center tours are effective for educating the public, news media, facility locators, excavators and operators on the overall one-call system and damage prevention process.
- Contractor and construction trade shows are unique opportunities to deliver the damage prevention public education message.
- Training videos and multi-media presentations are effective to reach facility owner/operator locating staffs, customer service personnel, and one-call center liaisons.

References:

- Various one-call centers including: AL, AZ, CO, CT, GA, ID, IL, IA, KY, MS, MO, NM, NY (City), NC, OK, OH, OR, TX, WV, and WI.
- Current industry materials, programs, and practices.
- National Land Improvement Contractors Association.
- API, INGAA, and AGA member companies.
- Industry associations including: AGC chapters, NUCA, and NTDPC.
- Various contract locating firms.

4. **TARGET MAILINGS**

Practice Statement: An effective damage prevention education program communicates vital damage prevention, safety, and emergency response information to target audiences through periodic mailings.

Practice Description: Target mailings can effectively communicate essential damage prevention, safety, and emergency response information. Direct mailings, with local information, are useful with residents and businesses that lie within a specified area. Such mailings are especially useful for reaching those residents and businesses that are in the corridor of the underground facility or proposed excavation route. Some examples are listed below:

- Direct mailed billing statements are ideal for including inserts provided by the one-call center, since the connection between underground facilities and Dig Safely can be readily made by the consumers.
- Additionally, space for a damage prevention message can be dedicated on the facility owners/operators' newsletters that are often included with the billing statements.
- Direct mailings, either in the form of letters or newsletters, are effective in targeting audiences such as lumber yards and stores, hardware stores, heavy equipment sellers, and rental equipment stores. These mailings can offer support materials such as point of-purchase brochure displays for sales counters, posters for retail aisles where digging equipment is found, and key chains for rental equipment ignition keys.
- An annual excavator newsletter, originated and mailed directly by the one-call center to all identifiable excavators in the call center's jurisdiction, keeps the customer base involved and informed of changes to the damage prevention system.
- Specialized brochures or letters can be mailed directly to address such issues as: failure to follow local damage prevention laws, guidance to homeowners to understand the damage prevention

process, and special requirements when excavations occur in agricultural or rural settings.
- Target mailing lists are developed using a combination of facility owners/operators' and one-call center internal sources, support partner mailing lists, and zip-code + 4/SIC code mailing lists. There are numerous software applications and databases available in the marketplace to support this.

References:
- Various one-call centers including: AL, AZ, CT, GA, ID, IL, IA, KY, MS, MO, NM, NY (City), NC, OK, OH, OR, WV, and WI.
- API Recommended Practice 1123.
- 49 CFR Parts 192, 194, and 195.

5. THE USE OF PAID ADVERTISING

Practice Statement: An effective damage prevention education program includes paid advertising to increase damage prevention awareness and practices.

Practice Description: Paid advertising through event sponsorships, radio, television, and print media is an effective means for communicating one-call system information and safe-digging requirements to target audiences. Paid advertising is particularly effective for reaching general excavators, construction designers and managers, equipment operators, property owners and tenants, farmers, facility owners/operators, and the general public. However, the use of paid advertising can be very costly and a measurement for success should be implemented early in the advertising campaign to gauge effectiveness. Measurements could include increased locate ticket volume or increased number of first-time callers to a one-call center. Additionally, creative placement of the message can ease the expense of paid advertising and enhance its effectiveness. Examples include transit system signs, sponsorship of news and weather reports on radio and television, industry trade exhibits and events, and print messages in trade publications.

References:
- Various one-call centers including: AL, CO, CT, GA, ID, IL, IA, KY, MS, MO, NM, NY (City), NC, OK, OH, OR, WV, and WI.
- Current facility owner practices, including various oil pipeline companies such as Marathon-Ashland Pipeline Company, North west Pipeline Company, and Equilon Pipeline Company.

6. THE USE OF FREE MEDIA

Practice Statement: An effective damage prevention education program utilizes all available free media.

Practice Description: When identified and used correctly, free media can be highly effective to communicate the Dig Safely message at minimal cost. For organizations with limited budgets, use of free media should be emphasized.

Press Releases: This tool is the preferred method to communicate "newsworthy" information about your damage prevention program to newspapers, trade publications and radio stations. Examples of occasions/events that are appropriate for press releases are:
- Call-Center milestones (millionth call, record month, record day),
- Year in Review (call volume statistics, damage reduction/increases),
- Election of New Board Members,
- Announcement of Excavator Safety Program Schedule,
- Announcement of New Utility Member,
- Changes to the State/Local Damage Prevention Law, and
- Seasonal "Call Before You Dig" Reminders.

Above is a sample press release. A basic press release, containing the Dig Safely message and fundamental information about the damage prevention program is on file for distribution to newspapers and other periodicals who often run special sections on topics such as home improvement and safety around the home.

JULIE, INC., 3275 EXECUTIVE DRIVE
JOLIET, IL 60435-8434 (815) 741-5000

NEWS

Contact: Mark A. Frost, Public Relations Manager
Monday-Friday 8:00 a.m. - 4:00 p.m. (815) 741-5005
After 5:00 p.m. (815) 439-6727
FAX (815) 741-5958

FOR IMMEDIATE RELEASE
January 1999

JULIE, INC./LOCAL UTILITIES TO SPONSOR EXCAVATOR SAFETY BREAKFASTS

JULIE, Inc., the Illinois One-Call System serving all of the state excluding the City of Chicago, in conjunction with local underground facility companies, is sponsoring twenty-four excavator safety breakfast meetings across Illinois. The breakfasts are being held to increase excavator awareness of the underground facility dangers that exist and to encourage use of Illinois' facility notification system prior to the start of any project involving digging. Area breakfasts include . . . (please refer to attached list).

Each meeting will begin at 7:45 AM with a free breakfast buffet and will conclude by 9:30 AM. Attendees will view the latest JULIE safety video, "It's Where Safe Digging Starts," see local underground facility company displays, hear about the latest changes at JULIE, and have the chance to address their concerns and questions to JULIE and local underground facility company representatives. Every attendee will receive a free gift and one cash attendance drawing of $100 will occur at each breakfast.

For more information and/or to reserve a seat contact the JULIE, Inc. Public Relations Department at (815) 741-5000.

_____ # # #_____

Not-for-Profit Public Service Announcements (PSAs): Television and radio stations, as well as billboard companies, are often willing to donate air time or space for Public Service Announcements (PSAs) to not-for-profit organizations. To qualify, the organizations must have a safety-related message that benefits the general public.

Member Facility Owners/Operators: The member facility owners operators of the damage prevention system are, in effect, another source of free media for the Dig Safely message:

- Major facility owners/operators that purchase paid advertising on television, radio, and billboards can require that free Dig Safely PSAs be included in any media buy they make.
- Cable TV members should be provided copies of any Dig Safely commercial and encouraged to run it as a PSA on their system. (Many cable members have created their own messages for this purpose!)
- All members facility owners/operators should be offered vehicle bumper stickers and posters to place on their locating and service vehicles promoting the "Call Before You Dig" phone numbers.

State/Local Government: State and local governments can be yet another source of free media for your damage prevention

education program. The following are successful examples of their use:

- Proclamation by Governor of "Call Before You Dig" Month.
- Inclusion of safe-digging messages on state tollway/highway electronic message boards.
- Damage prevention messages in community newsletter of member municipal facility operators.

References:

- Various one-call centers including: AL, AZ, CO, CT, GA, ID, IL, IA,KY, MS, MO, NM, NY (City), NC, OK, OH, OR, TX, WV, and WI.
- Various one-call center member companies, such as Media-One, GTE, TCI Cable Co., Ameritech, and others.

7. THE USE OF GIVEAWAYS

Practice Statement: An effective damage prevention education program uses promotional giveaway items to increase damage prevention awareness.

Practice Description: Effective damage prevention education programs use giveaways to reach targeted audiences. Examples include notepads, pens, rolodex cards, mouse pads, ignition protectors, clipboards, and magnets. Items used should reflect the unique needs and interests of the target audiences and the regions served. For example, sports towels work in many areas and with many audiences. However, beach towels are probably only effective in states or areas near beaches. Giveaways can be distributed via awareness and safety meetings, targeted mailings, sponsored events, trade shows, and other methods. In all cases, items should be usable both for work and recreation.

Reference:

- Various one-call centers including: AL, AZ, CO, CT, GA, ID, IL, IA, KY, MS, MO, NM, NY (City), NC, OK, OH, OR, TX, WV, and WI.

8. ESTABLISHING STRATEGIC RELATIONSHIPS

Practice Statement: An effective damage prevention education program establishes strategic relationships.

Practice Description: Strategic relationships can be defined as "Making Friends Before You Need Them." This means having working relationships in place to leverage common resources. Successful damage prevention education programs establish strategic relationships with governmental agencies, emergency responders, associations of all types, media outlets, grass roots organizations, and others. These relationships involve partnering to further damage prevention education efforts. One example of such strategic relationships includes partnering with the state bureau of utilities, one-call centers, OCSI members, the Equipment Manufacturers Institute (EMI) and original equipment manufacturers to install "North American Equipment Decals" on the dashboards of new excavating equipment. Another example is the One-Call Systems Study (OCSS) for which this Report is written. The OCSS represents the establishment of a strategic relationship among various one-call systems stakeholders to further damage prevention education and awareness.

References:

- Various one-call centers including: AL, AZ, CO, CT, GA, ID, IL, IA, KY, MS, MO, NY (City), NC, OK, OH, OR, TX, WV, and WI.
- Illinois Commerce Commission.
- Existing strategic relationships, such as APWA/AGC and API NTDPC.

9. MEASURING PUBLIC EDUCATION SUCCESS

Practice Statement: An effective damage prevention education program includes structured annual or biennial (every two years) measurement(s) to gauge the success of the overall program.

Practice Description: Damage prevention education program effectiveness can be gauged in several ways. For example:

- Use of a direct mail or telephone survey to effectively determine how one-call center and/or member facility customers are hearing and recalling the damage prevention message.

- Use of Arbitron Areas of Dominant Influence (ADI) boundaries to measure increases in one-call center call volume and/or member facility owners/operators' one-call messages is also an effective measurement. For a given area, these can be compared against the money and resources used in that area for further indications of program effectiveness.
- The collection and tracking of individual or collective facility owners/operators' damage information from year to year is another outstanding method of measuring success, providing that other internal factors at a given facility owner/operator remain constant.

References:

- Various one-call centers including: CT, GA, IL, IA, KY, MS, MO, NC, OK, OH, and WI.
- API Data Collection Initiative.
- INGAA Foundation Pipeline Safety Awareness Material Focus Group Research Report.
- "Presentation of Findings: OPS/DAMQAT Underground Facility Damage Prevention Study" (nationwide survey).
- "Presentation of Findings: DAMQAT Pilot Evaluation Study" (regional survey).
- Great Lakes Common Carrier Committee Six-State Survey.
- Virginia State Corporation Commission survey on why damages occur.

Reporting and Evaluation Best Practices

1. **ALL STAKEHOLDERS REPORT INFORMATION.**
   Practice Statement: Facility owners/operators, locators, excavators, or stakeholders with an interest in underground damage prevention report qualified information on incidents that could have, or did, lead to a damaged underground facility.
   References:
   - API/AOPL Voluntary Accident Tracking Initiative.
   - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
   - Consolidated Edison Company of New York, Inc.
   - Florida Sunshine State One Call.
   - Massachusetts Department of Telecommunications and Energy.
   - New Hampshire Public Utilities Commission.
   - Pennsafe Bureau, Department of Labor and Industry.
   - Tennessee One-Call System, Inc.
   - Tierdael Construction Company - General Contractors.
   - United States Department of Transportation, Office of Pipeline Safety.
   - Virginia State Corporation Commission.
2. **STANDARDIZED INFORMATION IS REPORTED.**
   Practice Statement: The requested data is standardized and consists of minimum essential information that can be analyzed to determine what events could, or did, lead to a damaged facility. This means that collected data should include damage information, downtime and near-misses.
   References:
   - API/AOPL Voluntary Accident Tracking Initiative.
   - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
   - Consolidated Edison Company of New York, Inc.
   - Florida Sunshine State One Call.
   - Massachusetts Department of Telecommunications and Energy.
   - New Hampshire Public Utilities Commission.
   - Pennsafe Bureau, Department of Labor and Industry.
   - Tennessee One-Call System, Inc.
   - Tierdael Construction Company - General Contractors.
   - United States Department of Transportation, Office of Pipeline Safety.
   - Virginia State Corporation Commission.
3. **IDENTIFY THE NON-COMPLIANT STAKEHOLDER.**
   Practice Statement: It is important to identify the non-compliant stakeholder (facility owner/operator, excavator, locator, or one-call notification center) so that this group can be targeted with education and training. It may not be necessary to pinpoint the names and addresses of the offenders for the purpose of improving the damage prevention program.
   References:
   - API/AOPL Voluntary Accident Tracking Initiative.
   - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
   - Consolidated Edison Company of New York, Inc.
   - Florida Sunshine State One Call.
   - Massachusetts Department of Telecommunications and Energy.
   - New Hampshire Public Utilities Commission.
   - Pennsafe Bureau, Department of Labor and Industry.
   - Tennessee One-Call System, Inc.
   - Virginia State Corporation Commission.
4. **PERSON REPORTING PROVIDES DETAILED INFORMATION.**
   Practice Statement: If all of the requested data is not available, the person reporting the information provides the most complete information possible.
   Reference: Consolidated Edison Company of New York, Inc.

5. **REQUESTED INFORMATION MAY CHANGE.**
   Practice Statement: Requested information changes as additional or different data is deemed necessary for the evaluation process. The report is revised, as needed, to adapt to the changes in the state's statutes, the evolution of industry technology, and the awareness of root causes.
   References:
   - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
   - Massachusetts Department of Telecommunications and Energy.
   - Tennessee One-Call System, Inc.
   - Virginia State Corporation Commission.
6. **A STANDARDIZED FORM IS ADAPTED.**
   Practice Statement: A standardized form is adopted and distributed to all facility owners/operators, locators, excavators, and other appropriate stakeholders.
   References:
   - API/AOPL Voluntary Accident Tracking Initiative.
   - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
   - Massachusetts Department of Telecommunications and Energy.
   - New Hampshire Public Utilities Commission.
   - Pennsafe Bureau, Department of Labor and Industry.
   - Tennessee One-Call System, Inc.
   - United States Department of Transportation, Office of Pipeline Safety.
   - Virginia State Corporation Commission.
7. **THE FORM IS SIMPLE.**
   Practice Statement: Data is reported using a simple, standardized form. By limiting the number of hand-written responses, the information is easy to complete. Check-boxes or other simple answering techniques help the person reporting the information and make the evaluation process easier.
   References:
   - API/AOPL Voluntary Accident Tracking Initiative.
   - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
   - Florida Sunshine State One Call.
   - Massachusetts Department of Telecommunications and Energy.
   - New Hampshire Public Utilities Commission.
   - Pennsafe Bureau, Department of Labor and Industry.
   - Tennessee One-Call System, Inc.
   - United States Department of Transportation, Office of Pipeline Safety.
   - Virginia State Corporation Commission.
8. **TRAINING IS PROVIDED.**
   Practice Statement: Training and education on how and when to complete the form is made available.
   References:
   - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
   - New Hampshire Public Utilities Commission.
   - Tennessee One-Call System, Inc.
9. **FLEXIBILITY ON COMPLETING AND RETURNING FORM IS PROVIDED.**
   Practice Statement: Flexibility is provided for both completing and returning the form. This may include providing self-addressed forms, web page forms, faxing completed forms, and/or telephone reporting.
   References:
   - API/AOPL Voluntary Accident Tracking Initiative.
   - Florida Sunshine State One Call.
   - New Hampshire Public Utilities Commission.
   - Pennsafe Bureau, Department of Labor and Industry.

- Tennessee One-Call System, Inc.
- Virginia State Corporation Commission.

10. **THE FORM IS ONE PAGE.**
    Practice Statement: If possible, the form is limited to one page.
    References:
    - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
    - Massachusetts Department of Telecommunications and Energy.
    - New Hampshire Public Utilities Commission.
    - Tierdael Construction Company - General Contractors.
11. **STAKEHOLDERS COMPLETE THE SAME FORM.**
    Practice Statement: If possible, facility owners/operators, excavators, locators, and anyone else involved in the damage prevention process complete the same form.
    Reference: Virginia State Corporation Commission.
12. **AN ORGANIZATION IS IDENTIFIED TO RECEIVE THE INFORMATION.**
    Practice Statement: A centralized and independent organization is identified to receive and process completed forms.
    References:
    - API/AOPL Voluntary Accident Tracking Initiative.
    - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
    - Florida Sunshine State One Call.
    - New Hampshire Public Utilities Commission.
    - Pennsafe Bureau, Department of Labor and Industry.
    - Tennessee One-Call System, Inc.
    - United States Department of Transportation, Office of Pipeline Safety.
    - Virginia State Corporation Commission.
13. **THE ORGANIZATION IS ABLE TO INTERFACE WITH ALL STAKEHOLDERS.**
    Practice Statement: The organization collecting the information is able to interface with all groups to promote completion and return of completed forms.
    References:
    - API/AOPL Voluntary Accident Tracking Initiative.
    - Connecticut Department of Public Utility Control/Call Before You Dig, Inc. Consolidated Edison Company of New York, Inc.
    - Massachusetts Department of Telecommunications and Energy.
    - New Hampshire Public Utilities Commission.
    - Tennessee One-Call System, Inc.

9.6.2 Best Practices Associated with Evaluating Damage Prevention Data

The following is a list of best practices related to evaluating damage prevention data, as developed by the Reporting and Evaluation Task Team. Under each best practice is a list of sources. These sources were used as examples during the Task Teams discussions and may not be inclusive of all stakeholders that utilize the best practice.

14. **AN ORGANIZATION EVALUATES THE DATA.**
    Practice Statement: A centralized and independent organization, such as a Damage Prevention Committee, is identified to evaluate the completed forms and publish the data.
    References:
    - API/AOPL Voluntary Accident Tracking Initiative.
    - Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
    - New Hampshire Public Utilities Commission.
    - Tennessee One-Call System, Inc.
15. **THE ORGANIZATION HAS REPRESENTATION FROM ALL STAKEHOLDERS.**
    Practice Statement: The Damage Prevention Committee, with representation from all interested stakeholders, is utilized to assist in the evaluation process.

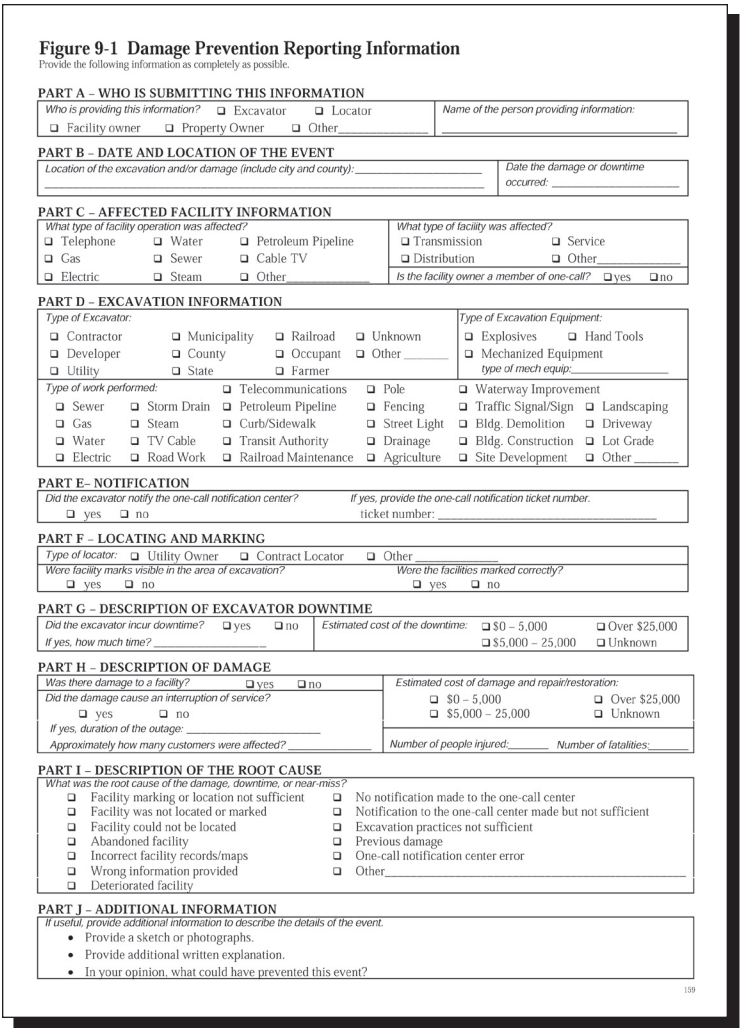

Figure 9-1 Damage Prevention Reporting Information

Provide the following information as completely as possible.

PART A – WHO IS SUBMITTING THIS INFORMATION

Who is providing this information? ❑ Excavator ❑ Locator ❑ Facility owner ❑ Property Owner ❑ Other_____

Name of the person providing information: _____

PART B – DATE AND LOCATION OF THE EVENT

Location of the excavation and/or damage (include city and county): _____

Date the damage or downtime occurred: _____

PART C – AFFECTED FACILITY INFORMATION

What type of facility operation was affected?
❑ Telephone ❑ Water ❑ Petroleum Pipeline
❑ Gas ❑ Sewer ❑ Cable TV
❑ Electric ❑ Steam ❑ Other_____

What type of facility was affected?
❑ Transmission ❑ Service
❑ Distribution ❑ Other_____

Is the facility owner a member of one-call? ❑yes ❑no

PART D – EXCAVATION INFORMATION

Type of Excavator:
❑ Contractor ❑ Municipality ❑ Railroad ❑ Unknown
❑ Developer ❑ County ❑ Occupant ❑ Other _____
❑ Utility ❑ State ❑ Farmer

Type of Excavation Equipment:
❑ Explosives ❑ Hand Tools
❑ Mechanized Equipment
*type of mech equip:*_____

Type of work performed:
❑ Sewer ❑ Storm Drain ❑ Telecommunications ❑ Pole ❑ Waterway Improvement
❑ Gas ❑ Steam ❑ Petroleum Pipeline ❑ Fencing ❑ Traffic Signal/Sign ❑ Landscaping
❑ Water ❑ TV Cable ❑ Curb/Sidewalk ❑ Street Light ❑ Bldg. Demolition ❑ Driveway
❑ Electric ❑ Road Work ❑ Transit Authority ❑ Drainage ❑ Bldg. Construction ❑ Lot Grade
❑ Railroad Maintenance ❑ Agriculture ❑ Site Development ❑ Other _____

PART E– NOTIFICATION

Did the excavator notify the one-call notification center? ❑ yes ❑ no

If yes, provide the one-call notification ticket number. ticket number: _____

PART F – LOCATING AND MARKING

Type of locator: ❑ Utility Owner ❑ Contract Locator ❑ Other _____

Were facility marks visible in the area of excavation? ❑ yes ❑ no

Were the facilities marked correctly? ❑ yes ❑ no

PART G – DESCRIPTION OF EXCAVATOR DOWNTIME

Did the excavator incur downtime? ❑yes ❑no
If yes, how much time? _____

Estimated cost of the downtime: ❑ $0 – 5,000 ❑ Over $25,000 ❑ $5,000 – 25,000 ❑ Unknown

PART H – DESCRIPTION OF DAMAGE

Was there damage to a facility? ❑yes ❑no

Did the damage cause an interruption of service? ❑ yes ❑ no

If yes, duration of the outage: _____

Approximately how many customers were affected? _____

Estimated cost of damage and repair/restoration:
❑ $0 – 5,000 ❑ Over $25,000
❑ $5,000 – 25,000 ❑ Unknown

*Number of people injured:*_____ *Number of fatalities:*_____

PART I – DESCRIPTION OF THE ROOT CAUSE

What was the root cause of the damage, downtime, or near-miss?
❑ Facility marking or location not sufficient
❑ Facility was not located or marked
❑ Facility could not be located
❑ Abandoned facility
❑ Incorrect facility records/maps
❑ Wrong information provided
❑ Deteriorated facility
❑ No notification made to the one-call center
❑ Notification to the one-call center made but not sufficient
❑ Excavation practices not sufficient
❑ Previous damage
❑ One-call notification center error
❑ Other_____

PART J – ADDITIONAL INFORMATION

If useful, provide additional information to describe the details of the event.
- Provide a sketch or photographs.
- Provide additional written explanation.
- In your opinion, what could have prevented this event?

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SAMPLE FORM FOR REPORTING DAMAGE PREVENTION INFORMATION

Using the best practices from one-call notification center, regulatory agency, facility, locator, excavator, and industry group report forms, the Reporting and Evaluation Task Team drafted a sample report form to demonstrate what data may be reported. This one page form would be used to gather data from all stakeholders involved in the damage prevention process, including facility owners/operators, excavators, and locators. The sample report form (Part I: Figure 9-1) is shown above.

The following list of references were used as examples during the Task Teams' discussions and the development of the composite report. These sources do not include all stakeholders that may report any of the same information shown on the sample form.

References:

•Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
• Consolidated Edison Company of New York, Inc
• Florida Sunshine State One Call.
• Massachusetts Department of Telecommunications and Energy.
• National Transportation Safety Board Safety Study: Protecting Public Safety Through Excavation Damage Prevention (NTSB/SS-97-01).
• New Hampshire Public Utilities Commission.
• Tennessee One-Call System, Inc.
• Tierdael Construction Company - General Contractors.
• Virginia State Corporation Commission

References:
- New Hampshire Public Utilities Commission.
- Tennessee One-Call System, Inc.
- Virginia State Corporation Commission.

16. **DATA IS USED TO IMPROVE DAMAGE PREVENTION EFFORTS.**
Practice Statement: The reported data is used to assess and improve underground damage prevention efforts.
References:
- API/AOPL Voluntary Accident Tracking Initiative.
- Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
- Consolidated Edison Company of New York, Inc.
- Massachusetts Department of Telecommunications and Energy.
- New Hampshire Public Utilities Commission.
- Tennessee One-Call System, Inc.
- Virginia State Corporation Commission.

17. **DATA IS USED TO ELEVATE UNDERGROUND DAMAGE AWARENESS.**
Practice Statement: The reported data is not primarily used to penalized or punish; rather, it is used to elevate underground damage awareness through recommended training and education.
References:
- Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
- Tennessee One-Call System, Inc.

18. **DATA IS SUMMERIZED BY KEY COMPONENTS.**
Practice Statement: The reported data is summarized by key components.
References:
- Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
- Consolidated Edison Company of New York, Inc.
- New Hampshire Public Utilities Commission.
- Tennessee One-Call System, Inc.
- Virginia State Corporation Commission.

19. **ROOT CAUSES ARE IDENTIFIED.**
Practice Statement: Root causes of damages or near damages are identified.
References:
- API/AOPL Voluntary Accident Tracking Initiative.
- Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
- Consolidated Edison Company of New York, Inc.
- New Hampshire Public Utilities Commission.
- Massachusetts Department of Telecommunications and Energy.
- Virginia State Corporation Commission.

20. **RESULTS ARE QUANTIFIED AGAINST A STANDARDIZED RISK FACTOR.**
Practice Statement: Results are quantified against a standardized risk factor. The risk factor considers a stakeholder's exposure to potential damage. This risk factor may be based on factors such as the number of miles of line installed or the number of one-call notification tickets. For example, a risk factor may compare how many underground damages occurred in a certain time period versus the total number of notification tickets issued.
References:
- Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
- Consolidated Edison Company of New York, Inc.
- National Transportation Safety Board Safety Study: Protecting Public Safety Through Excavation Damage Prevention (NTSB/SS-97-01).

21. **PERFORMANCE LEVELS AND TRENDS ARE ASSESSED.**
Practice Statement: Performance levels and trends are assessed against other organizations.

References:

- API/AOPL Voluntary Accident Tracking Initiative.
- Connecticut Department of Public Utility Control/Call Before You Dig, Inc.
- Consolidated Edison Company of New York, Inc.
- New Hampshire Public Utilities Commission.
- Tennessee One-Call System, Inc.

Appendix A: Glossary of Terms and Definitions

For the purpose of the Common Ground Study, a common set of definitions were utilized. These definitions were arrived at through a consensus process, similar to the methodology used to identify the best practices.

Abandoned Line or Facility: Any underground or submerged line or facility no longer in use.

Alternative Dispute Resolutions (ADR): Any process or procedure other than litigation that is agreed to by the disputing parties as the means for resolving the dispute, and is binding or non-binding pursuant to the agreement by the disputing parties. ADR includes, but is not limited to, advisory boards, arbitration, mini-trials, mediation, partnering and standing neutrals.

Attribute: Characteristic that helps describe the data.

As-built Drawing: A detailed depiction of facilities as installed in the field.

Backfill: To fill the void created by excavating.

Business Day: Any day of the week except Saturday, Sunday and state and federal legal holidays.

Cathodic Protection: The process of arresting corrosion on a buried or submerged structure by electrically reversing the natural chemical reaction. This includes, but is not limited to, installation of a sacrificial anode bed, use of a rectifier based system, or any combination of these or other similar systems. Wiring is installed between the buried or submerged structure and all anodes and rectifiers; wiring is also installed to test stations which are used to measure the effectiveness of the cathodic protection system.

Compliance: Adherence to the statute and its regulations.

Damage: Any impact or exposure that results in the need to repair an underground facility due to a weakening or the partial or complete destruction of the facility, including, but not limited to, the protective coating, lateral support, cathodic protection or the housing for the line, device or facility.

Damage Reporting: The immediate reporting to a one-call center and the facility owner/operator of any damage made or discovered in the course of excavation or demolition work. To alert immediately the occupants of premises as to any emergency that such person may create or discover at or near such premises. Also, contact emergency responders, if necessary, as quickly as practical.

Demolition Work: The partial or complete destruction by any means of a structure served by, or adjacent, to an underground line or facility.

Designer: Any architect, engineer or other person who prepares or issues a drawing or blueprint for a construction or other project that requires excavation or demolition work.

Digital mapping data: Geospatial data that is in a format that the computer can recognize.

Emergency: A sudden or unforeseen occurrence involving a clear and imminent danger to life, health, or property; the interruption of essential utility services; or the blockage of transportation facilities that requires immediate action.

Emergency Notice: A communication to the one-call center to alert the involved underground facility owners/operators of the need to excavate due to a sudden or unforeseen occurrence, or national emergency, involving a clear and imminent danger to life, health, environment, or property (including the interruption of essential utility services or the blockage of transportation facilities) that requires immediate excavation.

Emergency Response: A facility owner/operator's response to an emergency notice.

Excavate or Excavation: Any operation using non-mechanical or mechanical equipment or explosives used in the movement of earth, rock or other material below existing grade. This includes, but is not limited to, augering, blasting, boring, digging, ditching, dredging, drilling, driving-in, grading, plowing-in, pulling-in, ripping, scraping, trenching, and tunneling.

Excavator: Any person proposing to or engaging in excavation or demolition work for himself or for another person.

Facility Owner/Operator: Any person, utility, municipality, authority, political subdivision or other person or entity who owns, operates or controls the operation of an underground line/facility.

Facility: An underground or submerged conductor, pipe or structure used in providing electric or communications service (including, but not limited to, traffic control loops and similar underground or submerged devices), or an underground or submerged pipe used in carrying, providing, or gathering gas, oil or oil product, sewage, storm drainage, water or other liquid service (including, but not limited to, irrigation systems), and appurtenances thereto.

Geospatial data: Data that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth.

Geographic Information System (GIS): An organized collection of computer hardware, software, and geographic data used to capture, store, update, maintain, analyze, and display all forms of geographically referenced information.

Global Positioning System (GPS): A system consisting of 25 satellites used to provide precise position, velocity and time information to users anywhere on earth. Location information can be received using a GPS receiver. The GPS receiver helps determine locations on the earth's surface by collecting signals from three or more satellites through a process called triangulation. Simple and inexpensive hand-held receivers provide an accuracy of +/-100 meters of a true position. More sophisticated receivers that use additional technologies or post process the original GPS data can provide sub-meter accuracy.

Grade: The surface of the earth (i.e., ground level) upon which a structure is built or prepared.

Grounding Systems: A system of one or more ground conductors or ground rods providing a low resistance path to earth ground potential through a mechanical connection to structures, conductors and equipment.

Land base: Mapped data that depicts features of the surface of the earth and is tied to real-world geographic coordinates, such as latitude and longitude.

Latitude (Lat): Distance measured north or south of the equator.

Line: See definition for "Facility".

Locate: To indicate the existence of a line or facility by establishing a mark through the use of stakes, paint or some other customary manner, that approximately determines the location of a line or facility.

Locate request: A communication between an excavator and one-call center personnel in which a request for locating underground facilities is processed.

Longitude (Long): Distance measured east or west from a reference meridian (Greenwich).

Marking Standards: The methods by which a facility owner/operator indicates its line or facility in accordance with the APWA guidelines.

Member database: Structured collection of data defined for a particular use, user, system, or program; it may be sequential, network, hierarchical, relational, or semantic

Membership: Persons who participate voluntarily in a one-call notification center because they have an interest in the protection of lines or facilities, or because they have a statutory responsibility to protect lines or facilities.

Minor or Routine Maintenance of Transportation Facilities: The adding of granular material to unpaved roads, road shoulders, airport runways, airport taxiways, and railroad roadbeds; removal and application of patches to the surface of paved roads runways and taxiways; road, airport and canal lock facility crack or joint cleaning and sealing; replacing railroad ties and related appliances excluding road crossings; adjusting ballast on top of railroad roadbed; cleaning of paved drainage inlets and paved ditches or pipes.

Notice: The timely communication by the excavator/designer to the one-call center that alerts the involved underground facility owners/operators of the intent to excavate.

Notification Period: The time beginning when notice is given and ending when the work may begin.

One-Call Notification Center: An entity that administers a system through which a person can notify owners/operators of lines or facilities of proposed excavations.

Orthophoto: An aerial photograph of a site which has been differentially rectified to correct the distortion caused by the terrain and attitude (tip, tilt and yaw) of the camera. A multicolored, distortion-free, photographic image.

Person: Any individual or legal entity, public or private.

Planning: An activity at the beginning of a project where information is gathered and decisions are made regarding the route or location of a proposed excavation based on constraints including the locations of existing facilities, anticipated conflicts and the relative costs of relocating existing facilities or more expensive construction for the proposed facility.

Plat: A map or representation on paper of a piece of land subdivided into lots, with streets, alleys, etc., usually drawn to a scale.

Positive Response: Communication with the excavator, prior to excavation, to ensure that all contacted (typically via the one-call centers) owner/operators have located their underground facilities and have appropriately marked any potential conflicts with the areas of planned excavation.

Pre-Marking or Positive Site Identification: The marking of the proposed excavation site/work area consistent with APWA guidelines.

Subsurface Utility Engineering (SUE): An engineering process for accurately identifying the quality of underground utility information needed for excavation plans and for acquiring and managing that level of information during the development of a project.

Test Holes: Exposure of a facility by safe excavation practices used to ascertain the precise horizontal and vertical position of underground lines or facilities.

Tolerance Zone: The space in which a line or facility is located, and in which special care is to be taken.

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[18]

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

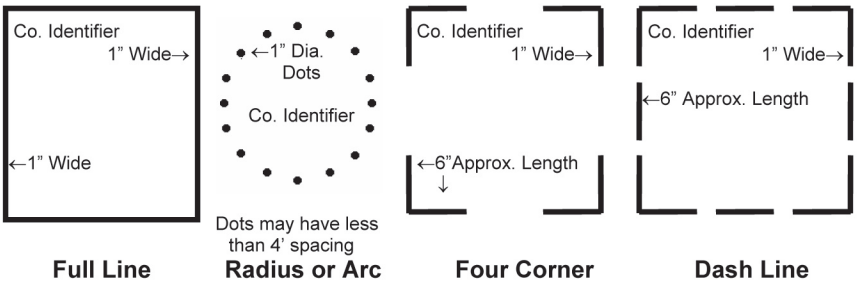
[18] TR-2001-05: Amendment Approved by CGA Board on September 24, 2004

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[19]

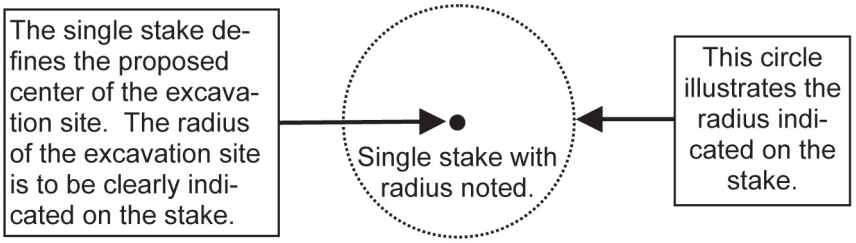
The following marking illustrations are examples of how excavators may choose to mark their area of proposed excavation. The use of white marking products (e.g. paint, flags, stakes, whiskers or a combination of these) may be used to identify the excavation site.

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.

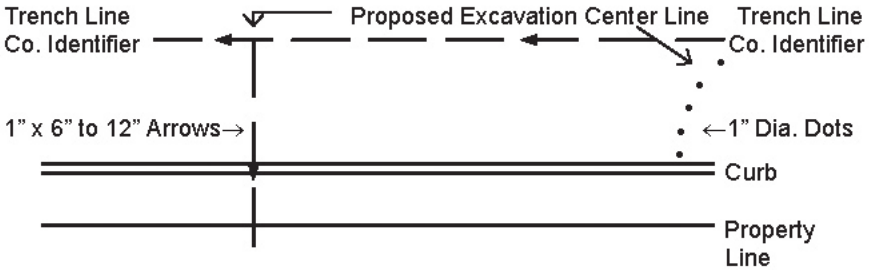
Single Stake Marking Center Point of Excavation Site



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.

19 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

Stakes, Flags or Whiskers Marking Four Corners

Stakes, Flags or Whiskers Marking Outline of Excavation

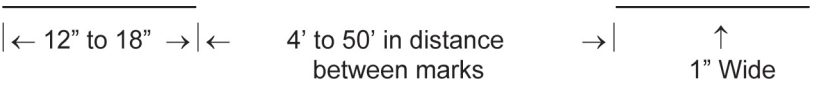
Delineate the proposed area of excavation through the use of: stakes, flags or whiskers to mark radius or arcs, the four corners of the project or outlining the excavation project instead of using spray paint. Limit the interval spacing to approximately 4' to 50'. The maximum separation of excavation 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.

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[20]

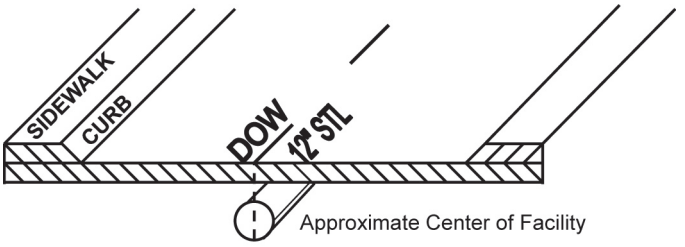
Operator markings of facilities include; the appropriate color for their facility type; their company identifier (name, initials, or abbreviation) when other companies are using the same color, the number and width of their facilities and a description of the facility (HP, FO, STL etc). Use paint, flags, 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.

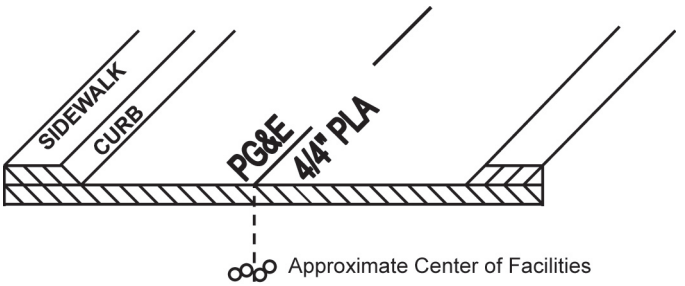


2. The following marking illustrations are examples of how an operator may choose to mark their subsurface installations

   a. **Single Facility Marking:** Used to mark a single facility, marks are placed over the approximate center of the facility. This example indicates 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.

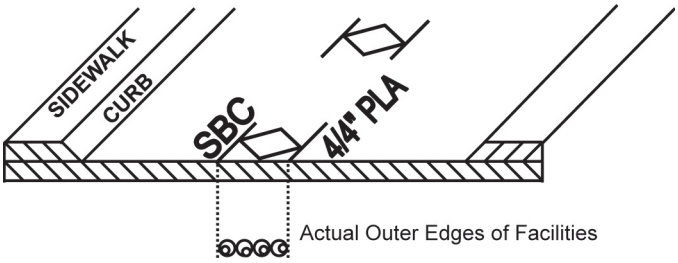


   b. **Multiple Facility Marking:** Used to mark multiple facilities of the same type (e.g. electric), where the separation does not allow for a separate tone for each facility but the number and width of the facilities is known. Marks are placed over the approximate center of the facilities and indicate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

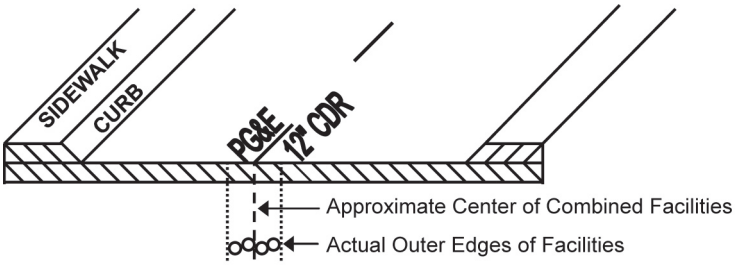


20 TR-2001-05: Amendment Approved by CGA Board on September 24, 2004

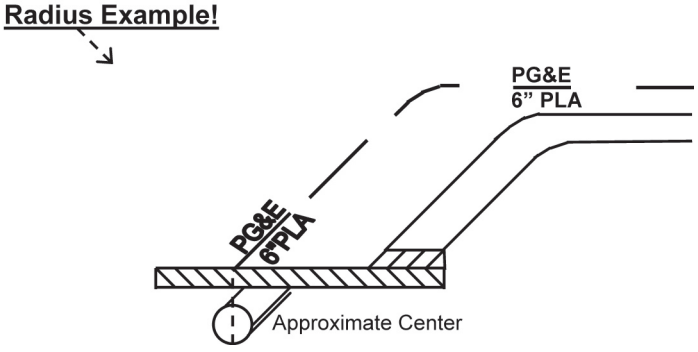
c. **Conduit Marking:** Used for any locatable facility being carried inside conduits or ducts. The marks indicating the outer extremities denote the actual located edges of the facilities being represented. An example would be 4 plastic conduits that are 4" in diameter (4/4" PLA), and the marks are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



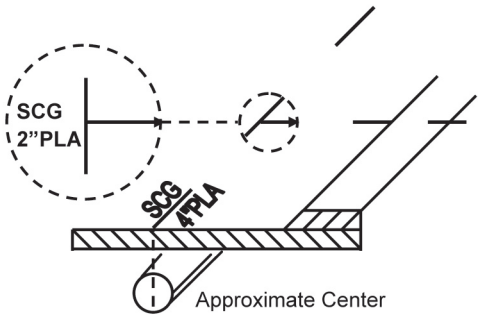
d. **Corridor Marking:** Used to mark multiple facilities of the same type (e.g. electric), in the same trench where the total number of facilities is not readily known (operator has no record on file for the number facilities) and that are bundled or intertwined. Marks are placed over the approximate 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).



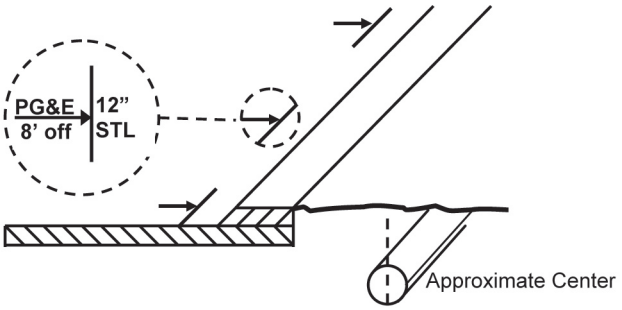
3. Changes in direction and lateral connections are to be clearly indicated at the point where the change in direction or connection occurs with an arrow indicating the path of the facility. A radius is indicated with marks describing the arc. When providing offset markings, (paint or stakes), show the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



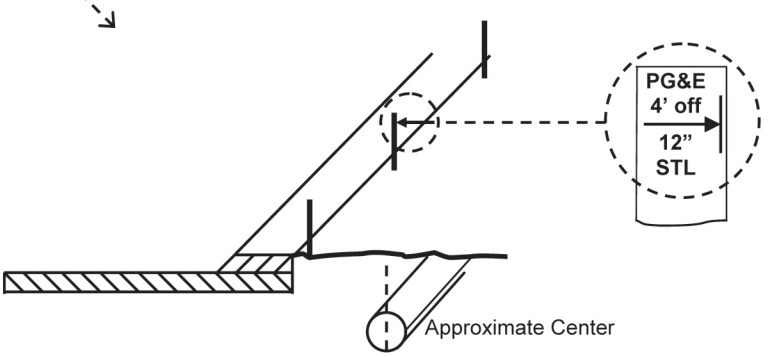
Lateral Connection Example!



Painted Offset (off) Example!



Staked Offset (off) Example!



4. 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.

CTYSAC	CITIZENS	VERIZON

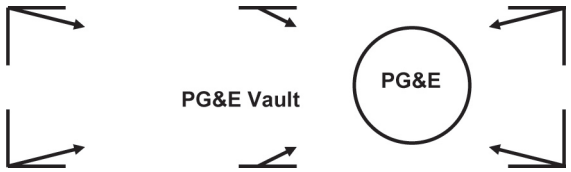
5. Information as to the size and composition of the facility is to be marked at an appropriate frequency. Examples are: the number of ducts in a multi-duct structure, width of a pipeline, and whether it is steel, plastic, cable, etc.

CCWD	RSVTEL	DOW
4" PLA	9 PLA	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).

ACWD	AT&T
6"PLA/12"STL	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. AT&T) would mark the area "NO" followed by the appropriate company identifier in the matching APWA color code for that facility (e.g. "NO AT&T")

   - 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 PG&E/G/D"). The example illustrates that PG&E 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.

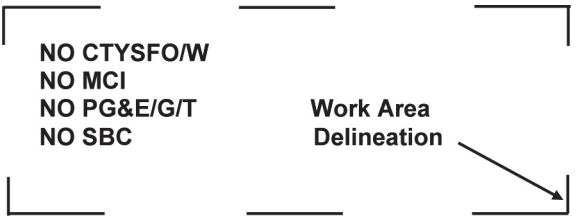
   - Place a clear plastic (translucent) flag that states "No Conflict" in lettering matching the APWA color code of the facility that is not in conflict. Include on the flag the operator's identifier, phone number, a place to write the locate ticket number and date. Operators of multiple facilities would 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

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

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. SBC/TEL/FO/PLA). This example indicates that SBC 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. SBC/FO/PLA).

CGA Member Organizations

AT&T
Aegis Insurance Service, Inc.
Air Products and Chemicals, Inc.
Alabama Gas Corporation
Alberta Once Call Corporation
Alliant Energy
American Fence Association
American Gas Association
American Petroleum Institute
American Public Gas Association
American Public Works Association
Aquila
Arizona Blue Stakes
Associated General Contractors of America
Association of American Railroads
Association of Equipment Manufacturers
Association of Oil Pipe Lines
Atlanta Gas Light Company
Atmos Energy Corporation
Austell Gas System
BP Pipelines (North America) Inc.
Baltimore Gas and Electric Company
Buckeye Pipe Line Company LP
CITGO Pipline Company
CMS Energy
CNA
Canadian Gas Association
Cascade Natural Gas Corporation
CenterPoint Energy
ChevronTexaco Pipeline Company
Citizens Gas & Coke Utility
City Utilities of Springfield
City of Mesa
City of Minneapolis, MN
Colonial Pipeline
Columbia Gas of Pennsylvania
ConocoPhillips
Construction Industry Advancement Program of NJ
Consumers Energy
Corinth Gas & Water
DTE Energy
Detroit Edison
Dig Safely New York Inc.
Diggers Hotline, Inc.
Ditch Witch
Dixie Pipeline Company
Dominion
Duke Energy Gas Transmission
ELM Locating & Utility Services
El Paso Corporation
Enbridge Energy Company, Inc.
Enron Transportation Services Company
Entergy Gas Operation
Enterprise Products Operating
Explorer Pipeline Company
ExxonMobil Pipeline Company
Gas Technology Institute
Georgia Electric Membership Corporation
Great Lakes Gas Transmission Company
Great Plains One-Call & Locating Service, Inc.
Greenville Utilities
Heath Consultants Inc.
Indiana Underground Plant Protection Service, Inc.
Interstate Natural Gas Association of America
JULIE, Illinois One Call
Kaneb Pipe Line Operating Partnership, L.P.
Kentucky Underground Protection, Inc.
Kern River Gas Transmission
KeySpan Energy Delivery
Kinder Morgan
Koch Pipeline Company LP
Lawrence Livermore National Laboratory
Magellan Midstream Partners, L.P.
Marathon Ashland Pipe Line, LLC
MCI
Memphis Light, Gas & Water

CGA Member Organizations

Michigan Consolidated Gas Company
Middle Tennessee Natural Gas District
MISS DIG System, Inc.
NUI Corporation
NW Natural
National Association of Pipeline Safety Representatives
National Energy & Gas Transmission, Inc.
National Telecommunications Damage Prevention Council
National Utility Contractors Association
National Utility Locating Contractors Association
NiSource
New Jersey Natural Gas
Niagara Mohawk
Nicor
North Carolina One Call Center
Northeast Gas Association
Northern Indiana Public Service Company
Northern Natural Gas
Office of Pipeline Safety, Research and Special Programs Administration
Oklahoma Natural Gas Company
Oklahoosa Gas District
One Call Concepts
PG&E National Energy Group
Pacific Gas & Electric Company
Pacific Pipeline System LLC
Panhandle Energy
Paradigm
Pennsylvania One Call
Peoples Energy
Piedmont Natural Gas
Pinnacle West Capital Corp/APS
Public Service Company of New Mexico
Public Service Electric & Gas Company
Puget Sound Energy
Questar Gas Company
Qwest Local Network
Radiodetection Corporation
Ronkin Construction
SBC Communications
SEMCO Energy Gas Company
SM&P Utility Resources Inc.
SPEC Services, Inc.
Scana Corporation
Sevier County Utility District
Shell Pipeline Company LP
South Dakota One Call Board
Southern California Gas Company
Southern Union Company
Southwest Gas
Suncor Energy
Sunoco Pipeline L.P.
Sunshine State One Call of Florida
TECO-Peoples Gas
Tennessee One Call
Texas Common Ground Committee
Texas Excavation Safety System, Inc.
Trench-It, Inc.
UGI Utilities, Inc.
Underground Safety Institute
Underground Service Alert - Southern California
USA North
Utilities Protection Center
Utilities Underground Location Center
Utility Locate and Mapping Services
Utility Notification Center - Colorado
Virginia Utility Protection Service, LLC
WE Energies
Washington Gas
Wiltel Communications
Commission
West Shore Pipeline Company
Williams Companies
Wisconsin Public Service Corporation
XCEL Energy Services

The Common Ground Alliance would like to recognize our members and sponsors for their dedication to the CGA and to "shared responsibility" in damage prevention. Through the contributions of our sponsors and member organizations as well as the dedication of our volunteers, the CGA has greatly advanced the mission of the organization and grown to over 1200 individuals and 125 member organizations.

In recent years, the association has established itself as the leading organization in an effort to reduce damages to underground facilities through shared responsibility among all stakeholders. Some of the milestones achieved during recent years include:

- Entered into a cooperative agreement with the Research & Special Program Administration,s Office of Pipeline Safety;
- Initiated CGA Regional Partner Program;
- Recognized in the Pipeline Safety Improvement Act of 2002;
- Assisted the Office of Pipeline Safety with successfully closing several outstanding National Transportation Safety Board recommendations;
- Instrumental in incorporating "the establishment of three-digit dialing" into the Pipeline Safety Improvement Act of 2002; and
- Finalized the development of the CGA-Damage Information Reporting Tool to serve as a national repository for underground damage data.

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We make things work for you.
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