
Introduction

The Ontario Regional Common Ground Alliance (ORCGA) is an organization promoting efficient and effective damage prevention for Ontario’s vital underground infrastructure. Through a unified approach and stakeholder consensus, ORCGA fulfils its motto of “Working Together for a Safer Ontario”.

We are a growing organization with over 265 organizations as active members and sponsors, and represent a wide cross section of stakeholders including:

Oil & Gas Distribution	Equipment & Suppliers	Landscape/Fencing
Transmission Pipeline	One-Call	Telecommunications
Road Builders	Insurance	Excavator
Safety Organization	Regulator	Municipal & Public Works
Homebuilder	Locator	Electrical Distribution
Engineering/LandSurveying	Railway	Electrical Transmission

For over a decade these stakeholder groups have been active in promoting “Call Before You Dig” and other good damage prevention practices through smaller separate entities which have come together and amalgamated under the ORCGA name to provide a single voice representing the damage prevention community in the province. The ORCGA has been a regional chapter of the Common Ground Alliance based in Alexandria, VA since April 2003.

The ORCGA has developed these Best Practices through the commitment and consensus of its members working together towards a safer Ontario. This version published February 2009 is the fifth publication and is an ongoing effort to develop new and improve existing practices.

These practices represent a dynamic statement of the type of activities that ORCGA believes would provide optimum levels of diligence towards preventing damage to underground infrastructure. Not all stakeholders are presently in a position to adopt all of these practices, however, it is anticipated that progression will be made towards following the practices over time.

Within this version, we have stated the date at which a Best Practice was introduced (i.e. New), modified (ie. Revised), or rewritten to a standard format (i.e. Reformatted). If not otherwise stated, the Best Practice has existed in its existing form since the initial publication of the Best Practices in 2004 (Version 1.0). The dates reflect the month in which the Best Practice was agreed upon by the ORCGA Board of Directors.

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, your input in helping us do so would be most appreciated. All industry stakeholders are welcome to submit suggestions and to join the Best Practice Committee. Participation at this level is not restricted to ORCGA members.

In order to submit a suggestion, or to participate in a committee meeting, please check the web site at <http://www.orcga.com> to learn about the scope of the various ORCGA Committees. The meeting dates and contact names and numbers are listed for each committee. If you have any general inquiries about the ORCGA, please feel free to contact the ORCGA at the following:

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PART I – Practice Statements

1-0 Planning & Design Best Practices

1-1: Planning Utility Corridors (New 09/2005)

Designers and planners should evaluate all applicable factors when determining the placement of underground utilities. Ideally speaking, existing utility corridors should be used to the fullest extent, and, for entirely new installations, consideration should be given to the creation of a common utility corridor for the current, and future placement of all utilities.

1-2: The Protection of Survey Infrastructure (New 02/2008)

When designing the location for placement of new utility plant, planners and designers should plan it accordingly in order to protect the survey infrastructure so that the public interest may be served and protected

1-3: Inclusion of utility infrastructure on Development Plans (Revised 09/2005)

For the purposes of this section Development Plans include; Official Plans, Re-zonings, Draft plans of Subdivision/Condominium, and Site Plans. Development plans involving the development of real property should include the designation of existing and proposed both above and underground utility infrastructure.

1-4: Gathering Information for Design Purposes

The designer/engineer should use all reasonable and available means of obtaining information about utility facilities in the area to be developed.

1-5: Subsurface Utility Engineering (SUE) (New 03/2007)

The project owner should consider the use of Subsurface Utility Engineering (SUE) techniques as a structured method of gathering and depicting utility information for design purposes.

1-6: Identifying Existing Facilities in Planning and Design

Designers should indicate existing utility facilities on drawings during planning and design.

1-7: Utility Coordination (Revised 09/2005)

Project owners and facility owners/operators should regularly communicate and coordinate with each other concerning current and future projects. Consideration should be given to the establishment of Utility Coordinating Committees (UCCs) mandated to deal with specific projects as well as issues of concern.

1-8: Underground Facilities should be locatable

The presence and type of underground facilities should be readily locatable, and may be identified through such devices as tone-able pipes, cables, tracer wire, or locator balls and may also include permanent above and/or below ground markers.

1-9: Follow All Applicable Codes, Regulations, and Facility Owner/Operator Standards (Revised 09/2005)

When planning and designing the installation of new or replacement facilities, the designer should ensure compliance with all

- federal and provincial statutes, regulations, codes, standards, and guidelines;
- municipal by-laws; and
- owner/operator standards.

1-10: Constructability Review

Although constructability reviews should occur throughout the design stage, prior to the finalization of the design, the project should be subjected to a constructability review. The participants in this process should include a constructor, the project designer/engineer, and the project owner. Other participants could include the facility owners/operators affected by the project. This process should result in a final design which can be circulated as appropriate for approvals.

1-11: Use of Qualified Contractors

Qualified contractors should be used to excavate on and near underground facilities.

1-12: Pre-Bid Conferences

Depending on the size and scope of a project, a pre-bid conference, involving all stakeholders, should be held and bids should be accepted from only those qualified contractors attending the pre-bid conference.

1-13: Contact between the Designer/Engineer and Potential Contractors during the Pre-Bid/Bid Phase

Once a project design is completed, the designer/engineer should be available to answer questions and clarify aspects during in the pre-bid/bid process.

1-14: Contact between the Designer and the Contractor during Construction

The designer/engineer should be available during the entire construction.

1-15: As-Built Drawings/As-Constructed Drawings (Revised 11/2008)

As-built/As-constructed drawings should be specified as a contract deliverable and should be prepared as soon as practicable, and the information recorded to aid in future locates and construction. This updated information should be circulated among the pertinent parties involved in the project as soon as practicable (i.e. municipalities, utilities, public works authorities, UCCs); and those parties should update their records accordingly. In this way, utility records should be maintained as current as possible.

1-16: Sewer/Watermain Service Connections (Revised 11/2008))

Sewer laterals and water main service connections should be installed and locatable from the main to 1.5m beyond the property line in new subdivisions.

1-17: Sharing of Sewer Main and Lateral Information (New 01/2009)

Project and facility owners should use all reasonable and available means to share sewer main and lateral information including, but not limited to, location.

2-0 One-Call Centre Best Practices

- 2-1: Pro-active Public Awareness, Education and Damage Prevention Activities**
The one-call centre has a documented, pro-active public awareness, education, and damage prevention program.
- 2-2: Specifically Defined Geopolitical Service Area with No Overlap**
The one-call centre serves the entire Province of Ontario so that an excavator need only make one call for it's members and a facility owner/operator need only belong to a single one-call centre.
- 2-3: Formal Agreements with Members**
Each member of the one-call centre abides by a written agreement that states the rights and the responsibilities of the one-call centre members and the one-call centre.
- 2-4: One-Call Centre Governance**
The one-call centre is governed by a Board of Directors with input from stakeholders.
- 2-5: Single Toll Free Number with North-American Access**
The one-call centre has a single toll free number with North-American access.
- 2-6: Hours of Operation**
The one-call centre can process locate requests 24 hours a day, 7 days per week.
- 2-7: Voice Record of All Incoming Calls**
A voice recording is maintained of all voice transactions concerning requests to locate facilities.
- 2-8: 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.
- 2-9: Caller Feedback**
The one-call centre provides the caller with the ticket number and the names of facility owners/operators who will be notified for each locate request.
- 2-10: Printed Ticket Recall**
The one-call centre can provide a printed copy of any ticket for a period of time determined by applicable statutes.
- 2-11: Documented Operating Procedures, Policies, and Manuals**
The one-call centre has documented operating procedures, human resource policies including health and safety and training manuals.

- 2-12: Documented Owner Verification of Data Submitted by Facility Owners/Operators**
The one-call centre returns the geographic description data base documentation to the facility owner/operator annually and after each change for verification and approval.
- 2-13: Flexibility for Growth and Change**
The operating plan of the one-call centre is sufficiently flexible to accommodate growth and change.
- 2-14: Meeting Between the Excavator and Facility Operator(s) Initiated by One-Call Centre Notification**
The one-call centre 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.
- 2-15: One-Call Centre Accepts Notifications from Designers**
The one-call centre accepts design requests and has the ability to process them as designated by the facility owners/operators.
- 2-16: Locate Request**
The one-call centre 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.
- 2-17: Practices to Reduce Over-Notifications**
The one-call centre 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.
- 2-18: Disaster Recovery**
The one-call centre develops, implements, and maintains an effective disaster recovery plan enabling the one-call function to continue in the event of a disaster.
- 2-19: Remote User Interface**
The one-call centre provides users a means of direct, electronic locate request entry that maintains comparable ticket quality to operator-assisted entry.
- 2-20: Accept Multiple Reference Points for Locate Requests**
The one-call centre 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 markers, address, street and cross street, etc.).
- 2-21: One-Call Centre Security**
The one-call centre provides appropriate physical and systems security, fire protection and electrical protection to protect the one-call center and its critical components.

- 2-22: Hardware Designed to Tolerate a Single Point of Failure**
The one-call centre uses fault tolerant hardware for its critical path operations, such as ticket taking, database access, and ticket delivery.
- 2-23: One-Call Quality Standards**
The one-call centre establishes performance standards for the operation of the center for the purpose of promoting accuracy, cost effectiveness and efficiency.
- 2-24: One-Call Centre Mapping**
The one-call centre maintains a current street centreline mapping database and updates it as new/revised map data becomes available to the centre.
- 2-25: One-Call Centre is the Interface between Excavators and Registered Facility Owners for the Purpose of Receiving Locate Requests**
The one-call centre is the interface between the digging community (all excavators) and registered owners of buried facilities for the purpose of receiving locate requests.
- 2-26: All Buried Facility Owners are Members of the One-Call Centre**
All buried facility owners are members of the one-call centre and register the location of their notification areas with the one-call centre.
- 2-27: Excavators Contact the One-Call Centre Before Excavating**
Excavators contact the one-call centre to request locates prior to excavating.
- 2-28: One-call Centre Advises Excavators to Contact Non-Members Directly**
The one-call centre will advise excavators on every request that not all facility owners are members of one-call centre and that the excavator must contact non-members directly to obtain locates prior to excavating.
- 2-29: One-Call Centre Accepts Locate Requests in Both Official Languages**
The one-call centre accepts locate requests in English or French and subscribes to a translation service for other common languages.
- 2-30: One-Call Centre is the Interface between Excavators and Registered Facility Owners for the Purpose of Updating the status of Locate completions**
The one-call centre is the interface between the digging community (all excavators) and registered owners of buried facilities for the purpose of updating the status of locate completions by members.
- 2-31: One-Call Centre reminds excavators digging on private property that they should advise the centre if they are aware of any private lines situated on the property**
The one-call centre reminds excavators digging on private property that they should advise the centre if they are aware of any private lines situated on the property and that it is the responsibility of the property owner to ensure that their private lines are located prior to excavation.
- 2-32: The One-Call Centre is the interface between excavators and registered facility owners for the purpose of reporting buried facilities not originally found on the locate sheet. (New 09/2005)**
The One-Centre will receive calls from the excavators reporting the discovery of unidentified facilities found within the excavation area.

3-0 Locating and Marking Best Practices

- 3-1: Use of Records**
Locators utilize on-site facility records at all times.
- 3-2: Record Corrections**
If a locator becomes aware of an error or omission, then the locator provides information for the updating of records that are in error or to add new facilities.
- 3-3: Colour Code**
A uniform colour code and set of marking symbols is adopted province-wide.
- 3-4: Locating Multiple Facilities**
A qualified, single locator used for multiple facilities.
- 3-5: Training**
Locators are properly trained and training is documented.
- 3-6: Locator and Public Safety (New 01/2009)**
Locates are performed safely.
- 3-7: Locate Quality**
A visual inspection is completed during the facility locating process.
- 3-8: Excavation Site Conditions**
Facilities are adequately identified for conditions.
- 3-9: Locate Status**
Positive response is provided to facility locate requests.
- 3-10: Multiple Facilities in “Joint Use” Trench**
Multiple facilities in a “joint-use” trench are marked individually and with corridor markers.
- 3-11: Locate Method Preference**
When locating electro-magnetically, active/conductive locating is preferable to passive/inductive locating.
- 3-12: Facility Identification**
The facility owner/operator is identified.
- 3-13: Communications**
Communication is established between all parties.
- 3-14: Locate Record**
Documentation of work performed on a locate is maintained.
- 3-15: Damage Reporting**
A damaged facility is investigated as soon as possible after occurrence of damage.

3-16: Workload Planning

Forecasting/planning for predictable workload fluctuations is an integral part of all operating practices. A responsive plan is developed for dealing with unpredictable fluctuations.

3-17: The Located Area

The located area is properly established and identified on the Locate Form.

3-18: Identification of Demarcation Point (New 02/2008)

When applicable, DPTs will indicate the demarcation point of the facility owner's plant on the locate sheet where this point is not at the point of building entry. This position will be marked on the locate sheet with a circled 'DM' symbol.

3-19: Practice Statement: Alternate Locate Agreements (ALA's) (New 01/2009)

May be used providing the Facility owner and Excavator agree on the terms and conditions.

4-0 Excavation Best Practices

4-1: 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 law, the excavator calls the one-call center at least four working days prior to beginning excavation procedures.

4-2: Privately Owned Facility Awareness (New 02/2008)

Prior to excavating, the excavator must be aware that privately owned buried facilities may exist within the work area and should request the private facility owner (e.g. landowner) to locate their underground facilities.

4-3: 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.

4-4: Locate Reference Number

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

4-5: Pre-Excavation Meeting

When necessary, the excavator or the locator may request a pre-excavating meeting at the jobsite just prior to the actual marking of facility locations. Such pre-excavating meetings are important for major, or unusual, excavations.

4-6: Facility Relocations

The excavator coordinates work with the affected facility owner/operator and the project owner where temporary or permanent interruption of a facility owner/operator's service is required.

4-7: Separate Locate Requests (Revised 09/2005)

Every excavator on the job has an appropriate locate form before excavating.

4-8: One-Call Access (24x7)

The excavator has access to the one-call centre 24 hours per day, 7 days a week.

4-9: Positive Response

The excavator is notified in writing 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 shown on a locate sheet provided to the excavator, or is notified in writing that an "all clear" situation exists. This takes place within three working days of the notification to the facility owner/operator of the locate request or a mutually agreed upon date between the locator and the excavator.

4-10: Facility Owner/Operator Failure to Respond (Revised 05/2005)

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. The one-call center contacts the facility owner/operator to ascertain the nature of the delay and heightens the locate status to an overdue locate. Where practicable, the facility owner/operator will respond with the locate and supporting documentation within 2 hours

4-11: Locate Verification

Prior to excavation, excavators verify the limits of the locate markings correspond with the limits of the proposed excavation. The excavator, to the best of their ability, checks for readily visible, unmarked facilities. If a locate is found to be incomplete, inaccurate, or any other discrepancies are found, the excavator may call the locator directly. If the locate is not corrected within 4 hours, the excavator can escalate the locate to the one-call centre as an overdue locate.

4-12: Work Site Review with Company Personnel

Prior to starting work, a competent person reviews the location of underground facilities with site personnel. Any locate documentation is kept on the project site.

4-13: 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. Such names and numbers shall be displayed on the locate sheet.

4-14: Facility Avoidance

The excavator uses reasonable care to avoid damaging underground facilities.

4-15: Federal and Provincial Regulations

The excavator adheres to all applicable federal and provincial occupational health and safety legislation and regulations.

4-16: Marking Preservation

The excavator, where practical, 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.

4-17: Excavation Observer

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

4-18: Excavation Tolerance Zone

The excavator observes a tolerance zone which is comprised of the width of 1 metre from the centerline of a located cable or conduit and 1 metre from either side of the outside edge of the underground facility on a horizontal plane. This practice is not intended to preempt any existing provincial or federal requirements.

4-19: 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, 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.

4-20: Unidentified Facilities (Revised 09/2005)

The excavator notifies the facility owner/operator directly or through the one-call system if an inaccurately marked or unidentified underground facility is found. Following this notification, the excavator may continue work if the excavation can be performed without damaging the facility.

4-21: Exposed Facility Protection

Excavators support and protect exposed underground facilities from damage.

4-22: Locate Request Updates (Revised 05/2005)

The excavator calls the one-call center to refresh the ticket when excavation continues past the life of the ticket. This recognizes that it is a best practice to define ticket life. Ticket life would best be 30 calendar days from the date the locate was performed as noted on the locate sheet, unless otherwise specified by provincial or federal law.

4-23: Facility Damage Notification

An excavator discovering or causing damage to underground facilities notifies the facility owner/operator as identified on the locate form. All breaks, leaks, nicks, dents, gouges, groves, or other damages to facility lines, conduits, coatings or cathodic protection will be reported.

4-24: Notification of Emergency Personnel

If the damage results in the escape of any flammable, toxic, or corrosive gas or liquid or endangers life, health, property or the environment, the excavator responsible immediately notifies the appropriate authorities and the facility owner/operator.

The excavator takes reasonable measures to protect workers and others in immediate danger; the general public; property, and the environment.

4-25: Emergency Excavation

In the case of an emergency excavation, the excavator notifies the one-call center and facility owner/operator and requests an emergency locate. The current practice in Ontario is a two-hour response time by the facility owner/operator.

4-26: Backfilling

The excavator protects all facilities from damage when backfilling an excavation.

4-27: As-Built Documentation

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

4-28: Vacuum Excavation Definition (New 09/2005)

Vacuum excavation is defined as a mechanical means of soil extraction through vacuum when using water or air jet devices for breaking ground. This method of excavation is commonly referred to as “soft excavation technology” and is commonly accepted as being equivalent or safer than hand digging within the “tolerance zone” around underground facilities.

4-29: Operator Competency – Vacuum Excavating (New 09/2005)

Vacuum excavation equipment shall only be operated by a “competent worker” as defined by OH&S regulations for Construction Projects. The operator must have knowledge, training and experience to perform the work, be familiar with the OH&S Act and the regulations that apply to the work and have knowledge of all potential or actual danger to health and safety in the work place. It is a best practice that workers have training recognized by the industry, defined work practices and manufacturer’s recommended procedures specific to the equipment they are operating.

4-30: Safe Operation of Vacuum Excavation Equipment (New 09/2005)

Vacuum excavation can be used to excavate safely around utilities if the equipment has been designed and engineered for vacuum excavating according to the manufacturer. Equipment must be operated in accordance with recognized practices and procedures that provide necessary levels of worker and public safety and prevent damage to underground utilities.

4-31: Frozen Ground Excavation (New 09/2005)

A preferred method for excavating within the tolerance zone around any underground utility in frozen ground is to use a hydrovac designed and built for this purpose.

4-32: Utility Owner Acceptance of Vacuum Excavation Practices (New 09/2005)

Each utility has a specific criterion for safe excavating practices. Some utilities view Vacuum Excavation as the equivalent to hand digging when exposing their utility and others have restrictions on their use. It is recommended excavators contact the utility owners to determine the extent of their restrictions for the use of this method of excavation around their plant.

4-33: Protection of Survey Infrastructure (New 02/2008)

Every excavator is responsible for recognizing and ensuring the integrity of survey infrastructure.

4-34: Excavation and Public Safety (New 01/2009)

Excavations are performed safely.

5-0 Mapping Best Practices

- 5-1: One-Call Center Responsibilities and Use of Mapping (Reformat 03/2006)**
The land base used by the One Call Centre for the electronic mapping system should be accurate and kept up to date with new information from facility owners/operators provided regularly. Ideally, the land base used is available to the public and can produce a ticket for the smallest practical geographical area utilizing latitude/longitude to describe the location.
- 5-2: Locator Responsibilities and Use of Mapping (Reformat 03/2006)**
Locators use maps to assist in finding the excavation site and to assist in determining the general location of the buried facility. Where discrepancies occur between mapping and facilities location determined by equipment, the locator should notify the owner/operator and the One-Call Centre.
- 5-3: Excavator Responsibilities and Use of Mapping (Reformat 03/2006)**
The excavator provides accurate excavation location information to the one-call centre.
- 5-4: Facility Owner/Operator Responsibilities and Use of Mapping (Reformat 03/2006)**
The facility owner/operator collects detailed location information on existing and newly constructed facilities and provides mapping data to the one-call center and the locator on a consistent basis.
- 5-5: Project Owner Responsibilities and Use of Mapping (Reformat 03/2006)**
The project owner provides accurate information on the scope of work and determines the starting and ending points, ideally by providing basic coordinates which define the centerline or area of construction.
- 5-6: Public Availability of Land Base (Reformat 03/2006)**
The land base should be available to the public.

6-0 Compliance Best Practices

- 6-1: Public Education (Reformat 03/2006)**
Public education programs are used to promote compliance.
- 6-2: Enforcement Education (Reformat 03/2006)**
Mandatory education is considered as an alternative or supplement to penalties for offenders of the damage prevention laws and regulations.
- 6-3: Incentives (Reformat 03/2006)**
Damage prevention programs include incentives to promote compliance with laws and regulations.
- 6-4: Penalties (Reformat 03/2006)**
Compliance programs include penalties for violations of the damage prevention laws or regulations.
- 6-5: Enforcement by Existing Authority (Reformat 03/2006)**
An authority or authorities are specified through provincial statutes and given the resources to enforce the law.
- 6-5: Structured Review Process (Reformat 03/2006)**
A structured review process is used to impartially adjudicate alleged violations.

7-0 Public Education Best Practices

7-1: Know Your Audiences and their Needs (Reformat 03/2006)

In order to effectively educate about damage prevention and influence damage prevention habits, it is necessary to identify the target audience, establish what their training needs are, and create a communications package that is tailored to those training needs.

7-2: Develop and Use a Marketing Plan (Reformat 03/2006)

Develop a Marketing Plan that will take in to account the training needs of the participants, available resources, communications media and timeframes.

7-3: Practice Good Project Management (Reformat 03/2006)

Practice good project management when executing the marketing plan.

7-4: Create a Damage Prevention Message that “Sticks” (Reformat 03/2006)

When promoting damage prevention, create a message that will “stick”.

7-5: Promote the Damage Prevention Message (Reformat 03/2006)

Promoting the damage prevention message by finding creative ways to persuade the target audience to a) listen attentively to the message, b) remember what they heard, and c) do something different because of it (i.e. - change their behaviours). Since some promotion activities can be expensive, partnering with other stakeholders can reduce costs.

7-6: Establish Strategic Relationships (Reformat 03/2006)

Establish and nurture strategic working relationships to assist in the promotion of damage prevention.

7-7: Measure Results and Use Them to Improve (Reformat 03/2006)

Critically review the results and outcomes of the various initiatives. An annual review is essentially a determination of successes and failures, followed by continuous program improvement to implement any lessons learned.

8-0 Reporting and Evaluation Best Practices

- 8-1: Reporting information**
All stakeholders have the opportunity to report information.
- 8-2: Standardized information**
Standardized information is reported.
- 8-3: Non-compliant stakeholder**
Identify the non-compliant stakeholder.
- 8-4: Accuracy of information**
Person reporting provides detailed information.
- 8-5: Changes in reporting format**
Requested information may change.
- 8-6: Simple process for collecting data**
A simple, one page form for collecting data is adapted.
- 8-7: Training process for collecting data**
Training is provided.
- 8-8: Common database in place**
An organization is identified to receive the data.
- 8-9: Data evaluation process**
An independent committee evaluates the data.
- 8-10: Purpose of data collection**
Data is used to improve damage prevention efforts and to evaluate underground damage awareness.
- 8-11: Data analysis**
Data is summarized by key components.
- 8-12: Root cause**
Root causes are identified.
- 8-13: Quantifying results**
Results are quantified against a standardized risk factor.
- 8-14: Results comparison**
Performance levels and trends are assessed.

PART II – Practice Statements & Description

1-0 Planning and Design Best Practices

1-1: Planning Utility Corridors (New 09/2005)

Practice Statement: Designers and planners should evaluate all applicable factors when determining the placement of underground utilities. Ideally speaking, existing utility corridors should be used to the fullest extent, and, for entirely new installations, consideration should be given to the creation of a common utility corridor for the current, and future placement of all utilities.

Practice Description: Pre-planning for utility placement within current or proposed utility corridors is vital to the overall safe operation of that corridor. Planners and designers should research, examine and evaluate the size, and location of the area to be utilized, and determine the type and running line location of the utilities that must utilize the corridor. In the case of existing corridors, the information developed must be assessed in the context of the proposed installation to determine the safest, most efficient, and most effective configuration. In the case of entirely new installations in proposed corridors, the information developed must be assessed in the context of a common corridor configuration that accommodates all of the utilities involved. Consideration should be given to issues such as safety, setbacks, future operations and maintenance, preservation of boundaries, clearances and future expansion.

Planning practices, such as joint trenching and the development of Utilidors, should be considered as options for maximizing the effectiveness of the available area. Similarly, standardized line locations could be adopted that promote the safest, most efficient, and most effective installations.

Consideration should be given to the development of provincially consistent standards for the planning, design, and construction of common utility corridors. This should incorporate minimum guidelines for sizes/spacing between utilities in corridors, protection of property bars, and the consistent standard placement of utilities within the Right of Way.

Current Practice:

- **Joint Trenching** is an encouraged practice which involves the use of a common trench for all of the utilities in a corridor.
- **Utilidors** is a concept that is becoming more prominent in many U.S. jurisdictions. It involves the creation of a common utility corridor for the future installation of utilities in a geographic area.
- **Running Line Locations** are consistent standard offsets from the property line and/or street line for placement of utilities.

Benefits:

The use of common utility corridors would result in the following benefits:

1. Accurate information as to the location of underground utilities in a particular geographic area.
2. Safe, efficient, and effective installation, placement, operation and maintenance and of underground utilities.
3. Efficient and effective utilization of land.
4. Easy identification and location of underground utilities in future development projects.
5. Damage Prevention.

References:

- Union Gas/Enbridge – Presentation on the Benefits of Joint Trenching
- City of London – UCC Orientation Manual

1-2: The Protection of Survey Infrastructure (New 02/08)

Practice Statement: When designing the location for placement of new utility plant, planners and designers should plan it accordingly in order to protect the survey infrastructure so that the public interest may be served and protected

Practice Description: Service laterals must be designed and installed to avoid disturbing property corners.

References:

1. Because of their significance, survey monuments are protected by both federal and provincial law.

The **Criminal Code of Canada R.S. 1985, c. C-46** under Part XI, Sec. 442 and 443 states, “Every one who willfully pulls down, defaces, alters or removes anything planted or set up as the boundary line or part of the boundary line of land is guilty of an offence punishable on summary conviction.”

Furthermore, the **Surveys Act, R.S.O. 1990, c. S.30**, restricts the setting of survey bars to Ontario Land Surveyors who are licensed by virtue of the having met strict academic and experience requirements.

2. City of Winnipeg Survey Infrastructure Clearance Program

<http://www.winnipeg.ca/PPD/surveys.stm#legal%20survey>

The City of Winnipeg coined the phrase "Survey Infrastructure" which placed the survey fabric on par with the other municipal infrastructures such as, sewer and water, hydro and gas, etc., which are recognized as being important and for which protection is provided.

1-3: Inclusion of utility infrastructure on Development Plans

Practice Statement: For the purposes of this section Development Plans include; Official Plans, Re-zonings, Draft plans of Subdivision/Condominium, and Site Plans. Development plans involving the development of real property should include the designation of existing and proposed both above and underground utility infrastructure.

Practice Description: Various items are required on the Development Plans filed prior to the development of lands. Where a Development Plan is to be filed, the items required should include the location[s] of both above and underground facilities traversing the land described on the Development Plan. Identification of the location[s] of both above and underground facilities on the Development Plan would provide notice to developers and the public about the existence of infrastructure facilities, and would alert facility owners/operators of the need to establish communication with the developers to facilitate planning for the lands which complements the utility infrastructure. Facility and utility owners should maintain timely and accurate records of all abandoned and out-of-service plant, and this

information should be identified on Development Plans along with the existing, future, and proposed facilities.

Current Practice: City of Toronto's submission Requirements for Site plan approvals calls for the inclusion of existing and proposed utility information:

- **Site Plan:**
Existing and proposed sanitary and storm water drains, catch basins, siamese connections and curbing, hydrants, hydro poles and light standards.
- **Draft Plan of Subdivision:**
Municipal services available or to be available to the land proposed to be subdivided.

Benefits: The requirement that utility infrastructure locations be identified on Draft and Site Plans is shared with the underground facility owners/operators should ensure that facility owners/operators are fully aware of development which will impact on their facilities well in advance of the commencement of excavation activity. It should also facilitate the optimal use of the land being developed, and maintain the integrity of the utility infrastructure.

References:

- City of Toronto – Draft Plan of Subdivision Section 51(17) Planning Act R.S.O. 1990, Chapter P.13
- Registered Statutes of Ontario – Ontario Planning Act and Regulations

1-4: Gathering Information for Design Purposes

Practice Statement: The designer/engineer should use all reasonable and available means of obtaining information about utility facilities in the area to be developed.

Practice Description: During the planning or preliminary design phase of a project, all available information should be gathered from the facility owners/operators, including maps of existing, abandoned, and out-of-service facilities, as-builts of facilities in the area, proposed projects, and schedules of work in the area. The methods of gathering information should include contacting a One-Call Centre, facility owners/operators, property owners, PUCs, and government [municipal, provincial, and federal] departments and agencies. They also include a review of the site for above ground evidence of underground utilities, e.g. permanent signs or markers, manhole covers, vent pipes, power and communication pedestals, and valve covers. The facility owner/operator provides the locations of their underground facilities by other means, such as by marking preliminary design drawings or providing facility records to the designer. This latter option for gathering the required information should be pursued purposefully by the designer. The information gathered by these methods is used by the designer for purposes of route selection and preliminary neighbourhood impacts, or in the evaluation of different design possibilities.

During the detailed design phase of a project, it is necessary to develop detailed information on the locations of utility facilities in the project area in order to ensure accuracy, and minimize the possibility of utility conflicts. This detailed information can be obtained through a survey of utility infrastructure and the methods utilized should be documented.

Current Practice: Project owners utilize some basic practices when performing a survey of utility infrastructure. For effective results the steps should be performed in

sequence. However it is not necessary to complete all steps depending on the level of information required. The steps are as follows:

1. Use all available existing utility facility records to obtain information about locations of existing and proposed underground facilities in the entire construction project area;
2. Visit the job site to correlate the information already gathered about existing utility facilities with above ground features;
3. Use appropriate instruments to determine the approximate horizontal locations of the underground facilities identified; and
4. Use test holes to positively determine the exact location of existing underground facilities. At this point, horizontal and vertical control measurements may be taken. Test holes are used to positively locate and identify an underground facility by exposing the facility by a non-destructive means, e.g. vacuum excavation.

Benefits: Gathering underground facility information and incorporating this information in the planning and design phase minimizes the hazards, cost, and work to produce the final project. Safety is enhanced, unexpected facility conflicts are eliminated, and facility relocations are minimized.

References:

- Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data – American Society of Civil Engineers [CI/ASCE 38-02]

1-5: Subsurface Utility Engineering (SUE) (New 06/2006)

Practice Statement: The project owner should consider the use of Subsurface Utility Engineering (SUE) techniques as a structured method of gathering and depicting utility information for design purposes.

Practice Description: SUE is applied during the design phase to locate, identify, and characterize all existing utility infrastructure (and other relevant non-utility features) found within a given project. SUE is applied in a structured manner, in accordance with practices and Quality Levels found in ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data. Although the Standard is more detailed and comprehensive, the following is a brief summary of the Quality Levels defined therein: Quality Level D – information gathered solely from existing utility records which will provide an overall sense of the congestion of utilities, but is limited in terms of comprehensiveness and accuracy.

The four [4] Quality Levels are:

1. Quality Level D – information gathered solely from existing utility records which will provide an overall sense of the congestion of utilities, but is limited in terms of comprehensiveness and accuracy. Use of Quality Level D information should be limited to project planning and route selection activities;
2. Quality Level C – information gathered from surveying above ground facilities such as manholes, valve boxes, and pedestals which is used to augment the information gathered in Level D;

3. Quality Level B – involves ‘designating’ or the use of surface geophysical techniques to determine the existence and horizontal position of facilities, including those identified in Level C. Two-dimensional mapping information is obtained. The data obtained is usually sufficient for excavation planning. The data obtained can facilitate decisions with respect to the placement of new structures or facilities to avoid conflicts with existing facilities; and
4. Quality Level A – involves ‘locating’ or the use of nondestructive excavation devices at critical locations to determine the precise horizontal and vertical position of existing facilities, as well as the type, size, condition, material, and other characteristics. When surveyed and mapped, precise plan and profile information is available for use in making final design decisions. The SUE engineer guarantees the accuracy of the Level A information.

1-6: Identifying Existing Facilities in Planning and Design

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

Practice Description: During the planning and preliminary design phase of a project existing facilities, such as hydro, gas, telecommunications, catv, water mains and sewers should be shown on preliminary design plans. The planning documents should include possible routes for the project together with known underground facility information. The facility owners/operators should be given the opportunity to provide appropriate comments.

During the detailed design phase of a project, utility facility information is shown on the plans. The method used to gather information should be noted on the plans by the project owner so that the designer and the contractor both know the quality of the information included on the plans. The facilities shown should include active, abandoned, out-of-service, future use, and proposed facilities. The design plans should include a summary showing the proposed facility route or excavation. The design plans should be provided to affected facility owners/operators in order to provide an opportunity for final comment/clarification.

Current Practice:

Region of York practice, as described below:

At 30% Design Review

A utility coordination meeting is set up for the Project Manager to meet with all Utilities having facilities within the boundaries of the project, as well as potential utilities that may wish to place facilities within the limits of the project. Plan design drawings and cross sections are circulated to the utility companies prior to the meeting highlighting potential conflicts. During the meeting the following issues are addressed:

- Ensure that all utilities have been correctly identified on the base drawings
- Identify Areas of conflict
- Discuss Potential Solutions
- Discuss the Region's project timing

- Address relocation restrictions such as property acquisition, stream or railway crossings
- Discuss additional test pitting that may be required as well as level of detail required (i.e. SUE)

Minutes should be prepared by the project Manager or his/her consultant and circulated to all attendees for verification.

At 60% Design Review

At the second utility coordination meeting, the utility companies should be bringing to the table a drawing (supplied originally by the Region) showing how each utility will be addressing their relocations. Each facility's location should be based on Regional standard offsets and comments made at first meeting. This meeting should accomplish the following:

- Approval in principal is given for the overall co-ordination plan
- General timing required for relocation
- Date confirmed for receipt by Region for final drawings for approval and Municipal consent
- Project timing update
- General estimate

Minutes should be prepared by the project Manager or his/her consultant and circulated to all attendees.

At 90% Design Review

By this point in time, the utility relocation plans have been submitted and approved, cost sharing estimates (in accordance with the governing agreements) have been submitted and approved, written notification to each utility mandating relocation (in accordance with the governing agreements) has been given and notification time has passed. All land acquisition has been secured by the Region, and all utilities should be on site relocating their facilities.

If the utility can only move during the reconstruction contract, a relocation timing window must be established to co-ordinate works and provide for a separation of time and distance between contractors.

At Pre-Tender Meeting

Calls are made to each utility confirming progress on site and ensuring relocation complete prior to Region's contractor on site.

Benefits: Providing complete underground facility information and including this information on design drawings reduces safety hazards, simplifies coordination, and minimizes final project costs.

References:

- Region of York –Design Review Guideline

DESIGN PROCESS

1-7: Utility Coordination (Revised 09/2005)

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

Consideration should be given to the establishment of Utility Coordinating Committees (UCCs) mandated to deal with specific projects as well as issues of concern.

Practice Description: Project Owners should circulate design drawings to facility owners/operators for the purpose of allowing the facility owner/operator to identify the location of their infrastructure, and potential conflicts. The design drawings should contain sufficient information of the proposed work to allow the facility owner to understand the scope of the work and the impact of such work on their structures. Where relocation of facilities will be required, a realistic schedule should be developed that allows time for the design, construction and budget approval of the relocated facilities.

Utility coordinating committees provide a mechanism through which win-win solutions can be developed for problems associated with the management of the public and private infrastructure projects within the public road allowance. These problems are generally due to poor communication and coordination between the key parties involved in the design and construction of the public and private infrastructure works in the public road allowance. The impact of this poor communication and coordination is often significant increases in project costs, project construction delays and difficult working relationships due to the need to relocate existing infrastructure. The frequency of these problems and their potential impact on project budgets increases with the density of the infrastructure, the demand for occupancy and space within the road allowance and poor quality as-built records of existing public and private infrastructure. An active utility coordinating committee mitigates the frequency and financial impact of these problems through improved communication procedures, improved coordination of planned capital works / operation works and improved working relationships.

The key factors in the success of a UCC are:

- The committee be founded and guided by the spirit of cooperation;
- The committee operate under a Terms of Reference or Charter approved by the Committee members;
- The member organizations be committed to the responsibilities of the committee; and
- Strong leadership, planning ability and implementation skills are necessary skills of the designated representatives of each member organization.

Current Practice: As a part of the Regional Municipality of Waterloo process for developing Preliminary Design Reports (PDRs) for road projects identified in the first three years of the Region’s Roads Capital Program, the Region has developed checklists to ensure proper and complete feedback from the UCC members.

The checklists have been prepared to allow for detailed feedback from the UCC members to ensure proper planning, coordination and funding of projects between the Region and other agencies.

Bell Canada initiated a process for the sharing of information among the utilities, which is known as a “single source management system” (Viecon). It facilitates the electronic sharing of information among the utilities at what can be best described as the project initiation phase. The benefits associated with the system include timely and accurate responses to requests for markups, cost efficiencies and improved communication among those utilities.

Benefits: Regular communication between utility owners/operators, municipalities, consulting engineers and contractors improves the level of information concerning

current and future projects, and contributes to the identification and resolution of issues of mutual concern.

References:

- Regional Municipality of Waterloo – Utility Agency PDR Review Checklist
- Municipal Consent Requirements – City of Toronto Version 3 February 2003
- TPUC Vertical and Horizontal Separations and Depths for Buried Plant March 2002
- Mississauga PUCC Information Handbook – October 2003
- Group Telecom – Agency Design Initiation Notice [DIN] Review Checklist
- Union Gas/Enbridge – Presentation on the Benefits of Joint Trenching
- Region of York – E-build

Communications Protocol

Principles for effective communication in joint utility coordination

Communications among project owners and facility owners/operators should reflect the following:

- **Timeliness** – Communication among the stakeholders in any project should emphasize the importance of timeliness. Project progress can be facilitated through attention being placed on the time required to respond to requests for information and/or approvals. Conversely inadequate attention to time can lead to significant project delays. The stakeholders should be aware of the time required for responding to such requests, and should incorporate those time lines into the overall project schedule.
- **Response Times** – Once the time requirements for the collection and compilation of information, completion of design and/or the securing of approvals have been identified, response times should fall within the time parameters established.
- **Scope** – The exact nature of the request must be clearly stated, and understood by both the requester and the responder. If the requested information, design and/or approval cannot be provided within the overall response times established, this fact should be communicated.
- **Frequency** – The communication should be regular and on-going so that the needs of both parties are fully understood.

Stages

Communications between project owners and facility owners/operators should take place at each of the following stages:

- **Long Range Planning** – The point at which the ‘strategic, long-term’ capital plan is being developed, and approved.
- **Multi-Year Program** – The point at which the multi-year capital plan is finalized and approved. Multi-year time frames vary according to the project owner’s overall planning framework, but, for the purposes of this protocol, multi-year is a minimum of two years, and a maximum of five years.
- **Project Design Initiation** – The point at which the project owner/facility owner/operator is able to define the scope of the project, including the likely starting time for construction.

- Detailed Design – The point at which the exact details of the project have been defined and the construction documents are ready for tender.
- Current Year Program – The point at which the current year program is approved and financed for program construction.
- Construction – During the construction period in order to respond to any circumstances or situations, e.g. where design alterations need to be made.

General

The benefits associated with good project communications between project owners and facility owners/operators cannot be overstated. Regular communication improves the level of information among the stakeholders, facilitates the early identification and resolution of issues/concerns, and contributes to good overall project management. A number of public bodies have recognized the importance of good communications, and developed guidelines/standards in this area. Examples worth examining are the Utility/Agency PDR Review Checklist utilized by the Regional Municipality of Waterloo, and the Mississauga PUCC Information Handbook.

1-8: Underground Facilities should be locatable

Practice Statement: The presence and type of underground facilities should be readily locatable, and may be identified through such devices as tone-able pipes, cables, tracer wire, or locator balls and may also include permanent above and/or below ground markers.

Practice Description: No underground facilities should be installed that cannot be readily found at a later date. Existing methods for locating utilities include using geophysical methods for tone-able facilities and those with tracer wire, or the use of permanent locator ball systems. A combination of above and below, ground markers could also be used to identify and locate underground facilities. The above ground markers are to identify facilities, and not to circumvent the need to locate facilities prior to excavation. Above ground markers should be developed in the design phase of a project, and should include the company name, type of facility, and emergency contact. The location and types of markers should be specified in the construction plans. (APWA colour standards)

Examples of Practice:

1. In planning the designer should obtain a list of affected facilities and contacts the facility owner for design and encroachment information. The design should include, as specified by the facility owner/operator, marker locations for each encroachment during and after construction.
2. In the installation of additional underground facilities, the designer should obtain a list of affected facilities, and should include a detailed marker system to effectively mark the underground facilities. Examples of a detailed marker system include tracer wires on non-metallic facilities and electronic or surface markers for facilities at excessive depths.

Benefits: The design includes provisions to aid in future locates. In addition, an effective marker system will assist facility owners/operators or first responders to an area involving more than one underground facility or an incident near underground facilities.

References:

- Enbridge
- Durham Region – Regional Design Guidelines for Sewers
- OPS
- NEB
- Bell Canada

1-9: Follow All Applicable Codes, Regulations, and Facility Owner/Operator Standards (Revised 09/3005)

Practice Statement: When planning and designing the installation of new or replacement facilities, the designer should ensure compliance with all

- federal and provincial statutes, regulations, codes, standards, and guidelines,
- municipal by-laws,
- owner/operator standards, and
- Best Practices.

Practice Description: The designer of a facility project should consider standards and practices and comply with codes, and regulations applicable to that particular facility, and adjacent facilities. As a matter of practice the designer should circulate the design to the appropriate stakeholders within the right-of-way to ensure compliance. Stakeholder review is facilitated by the level of detail which accompanies the design. Regulations, codes, standards and other design documents generally specify depth of cover, and horizontal and vertical clearances between adjacent facilities.

The designer should consider the protection and temporary support of adjacent facilities, and any interference with 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 and facility owners should make all parties aware of new and revised standards and codes that may affect the project.

Current Practice:

- Toronto Vertical and Horizontal Separations and Depths for Buried Plant
- Union Gas and Enbridge – Support of Gas Pipelines in the Vicinity of Excavations
- Enbridge – Third Party Requirements in the Vicinity of Natural Gas Pipelines

Applicable Regulations, Codes, and Standards: [NEB, OEB, OPS, CEC, CSA]
(see also Compliance Best Practices for related Regulations).

- National Energy Board Pipeline Crossing Regulations, Part I --- SOR/88-528
- National Energy Board Pipeline Crossing Regulations, Part II --- SOR/88-529

*New Regulations are currently being finalized

- CSA – Z662: Oil and Gas Pipeline Systems
- CRTC
- OEB
- OPS
- CEC

- CSA
- TSSA
- ESA
- MOEE

Benefits: By reviewing applicable regulations, codes, and standards, the designer minimizes potential conflicts/damages, and facilitates future locates.

1-10: Constructability Review

Practice Statement: Although constructability reviews should occur throughout the design stage, prior to the finalization of the design, the project should be subjected to a constructability review. The participants in this process should include a constructor, the project designer/engineer, and the project owner. Other participants could include the facility owners/operators affected by the project. This process should result in a final design which can be circulated as appropriate for approvals.

Practice Description: This practice will allow the designer/engineer, a constructor, project owner, and facility owners/operators to assess the constructability of the project design, assess project alternatives, review proposed schedules, and to facilitate smoother, less costly, more efficient and safer construction.

Example of Practice: Durham Region

Typically a formal Constructability Review is undertaken approximately halfway through the detailed design process for the larger Capital Works Projects. The project design phase is sufficiently advanced to a point that a constructor has sufficient information to make educated comments on the most efficient and cost effective approach to completion taking into account factors such as scope of work, public/community relations, operational restrictions peculiar to the site, potential detour routes and staging requirements. This process was used to good effect on projects on Ritson Road in Oshawa and Consumers Drive in Whitby to support and demonstrate the advantages of full road closure as opposed to staged construction that permits full public access to the site.

Benefits: The application of constructability reviews will result in more efficient construction, more effective design, reduced costs, and improved safety.

References:

- OSWCA – Standard Procedures for Sewer and Watermain Contracting in Ontario – Section 1.5

PRE-BID/BID

1-11: Use of Qualified Contractors

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

Practice Description: Contractors that excavate on and near underground facilities should possess the qualifications necessary to conduct such activities in a manner that is both safe and reliable, and ensures a quality product. The use of qualified contractors ensures that contractors retained to work on a project are capable of

performing the work required, and operate safely. By requiring contractors to be qualified, public safety is protected as is the integrity of the underground facilities in the area of the excavation. Allowing a competitive bidding process from qualified, competent, and experienced contractors should assure both quality and price, and should minimize the risk of damage to underground facilities.

Example of Practice: Most large organizations involved in capital works have developed policies to qualify contractors. These policies often involve establishing criteria in such areas as financing, insurance, occupational health and safety, and performance which must be met prior to participating in the bid process.

WSIB Incentives Programs – CAD-7, MAP These programs calculate rebates or surcharges for various contractors based on safety performance. A full fledge experience rating program is being developed as part of contractor accreditation. There is also a move to develop a set report that can be used by contractors/project owners.

Benefits:

- Quality of work;
- Improved safety; and
- Minimized Risk

References:

- Ministry of Transportation
- Union Gas
- Enbridge
- Workers Safety and Insurance Board
- DUPONT
- General Motors
- Greater Toronto Airport Authority

1-12: Pre-Bid Conferences

Practice Statement: Depending on the size and scope of a project, a pre-bid conference, involving all stakeholders, should be held and bids should be accepted from only those qualified contractors attending the pre-bid conference.

Practice Description: The project owner should require that all potential qualified contractors attend a pre-bid conference involving the facility owners/operators whose facilities might be affected by the proposed excavation and project design. The pre-bid conference should address, as a minimum, the requirements of the project in relation to the protection, support, and safe maintenance of the facilities during the excavation and construction. Pre-bid conference proceedings should be recorded and minutes circulated to all those in attendance.

Examples of Practice: Pre-bid conferences normally involve the project owner, the project design staff, the facility owner/operators, and the potential contractors. During the pre-bid conference, the contractors are made aware of the special requirements of the project with respect to certification, safety, and the regulatory environment.

Benefits: Pre-bid conferences afford the opportunity for discussion among the owner, contractor, designer, and other interested parties of the many aspects of a proposed project, including:

1. Scope clarifications;
2. The review of contract documents;
3. Regulatory requirements;
4. Schedules; and
5. Damage Prevention.

Pre-bid conferences ensure that all potential participants in the project possess the same understanding of the project requirements, and complexities.

References:

- Region of Niagara
- Region of Durham – Purchasing Bylaw 68-2000
- Region of York
- Bell
- Enbridge
- Hydro One

1-13: Contact between the Designer/Engineer and Potential Contractors during the Pre-Bid/Bid Phase

Practice Statement: Once a project design is completed, the designer/engineer should be available to answer questions and clarify aspects during the pre-bid/bid process.

Practice Description: The designer’s continuing involvement with potential contractors during the pre-bid/bid phase ensures more effective communications between all the stakeholders. The designer will be available to communicate to the interested bidders the scope and complexity of the project and the proper understanding of the intended design.

Example of Practice: Contract documents should contain contact information for purpose of design clarification.

Benefits: This practice provides quality assurance and minimizes potential safety concerns and delays to project completion as well as the protection, support, and safe maintenance of the facilities during the excavation and construction. It also affords the designer the opportunity to relay information to potential contractors that is not readily shown on the contract drawings.

References:

- York
- Niagara
- Union
- Hydro One

CONSTRUCTION/POST-CONSTRUCTION

1-14: Contact between the Designer and the Contractor during Construction

Practice Statement: The designer/engineer should be available during the entire construction.

Practice Description: This practice ensures that design support is available for pre-construction conferences, unforeseen conditions, site meetings, design changes, and post-construction conferences.

Current Practice: When an undesignated or otherwise unknown underground facility and/or condition is discovered within a work area, the contractor advises the project owner and the designer. If the discovery is made during construction locates phase of the work, the designer can assess whether or not there is an impact on the design. Such discoveries can impact on the project by requiring additional work, increasing hazards from the facility, or conflicting with the installation of the new facility.

When a contract involves construction, Hydro One will provide an inspector on-site who has direct access to the project designer.

Benefits: Potential concerns are resolved more expeditiously, thereby minimizing subsequent modifications to the project design, costs, and completion. The designer's progress inspections of the project are also facilitated.

References:

- York
- Niagara
- Union

1-15: As-Built Drawings/As-Constructed Drawings (Revised 11/2008)

Practice Statement: As-built/As-constructed drawings should be specified as a contract/project deliverable and should be prepared as soon as practicable, and the information recorded to aid in future locates and construction. This updated information should be circulated among the pertinent parties involved in the project as soon as practicable, (i.e. municipalities, utilities, public works authorities, UCCs) and those parties should update their records accordingly. In this way, utility records should be maintained as current as possible.

Practice Description: Installation should be made in accordance with the approved construction plans. Any deviation to those plans should be approved/documentated/recorded on the as-built/as-constructed drawings. As-built/as-constructed drawings should be completed as soon as practicable and retained. The information should be made available for future projects. As-built/as-constructed drawings should be valid.

As-Built/As-Constructed Drawings should include:

1. Any deviations in construction from the approved design;
2. The level of accuracy in the horizontal and vertical locations of the underground utility;
3. The methodology used to measure the accuracy, e.g. geodetic survey, or relationship to topographical/physical features at the time of construction;
4. The date the drawings were prepared; and
5. The method of construction, e.g. directional drilling.

Current Practice: Upon completion of construction and prior to final acceptance of the installation by the Owner, all "as-built/as-constructed" measurements should be made and submitted. Typically these measurements note any deviation in horizontal and/or vertical alignment from the established baseline, the location of valves, access chambers, manholes, service boxes and stub connections for services. In addition

they should note final invert elevations, pipe size, grade changes, any applicable structural details of manholes/chambers and any other information as deemed necessary that may affect future maintenance of the utility. All drawings should note these changes “As Recorded” with date on the drawings in a prominent location.

Benefits: Accurate as-built/as-constructed drawings serve as integral initial information source for future projects, and minimize the risk of damage to existing underground facilities.

References:

- Region of Durham – Design Specifications for Regional Services

1-16: Sewer/Watermain Service Connections (Revised 11/2008)

Practice Statement: Sewer laterals and watermain service connections should be installed and locatable from the main to 1.5m beyond the property line in new subdivisions.

Practice Description: For the purpose of health & safety, damage prevention and construction efficiency, sewer laterals and water service connections installed in new subdivisions should be extended from the main to 1.5m beyond the property line and plugged with a water tight plug. This allows workers installing the connections from the stubs to the homes to establish a safe stable work environment and minimizes impact to the existing facility infrastructure.

References:

- Region of Durham S-301 rev 2005 & Region of Durham s-410 rev 2005
- Extension of the Laterals Best Practice prepared by: Robert Celsi, Executive Director, OCDCA, Ray DiDonato P. Eng, VP, OCDCA, Frank Tucci, Chair Worksafe Committee, OCDCA, Daniel Fiorini, CET, CSAO Low Rise Labour management Health & safety Committee
- ORCGA Planning & Design Committee (Feb, 2006)

1-17: Sharing of Sewer Main and Lateral Information (New 01/20090)

Practice Statement: Project and facility owners should use all reasonable and available means to share sewer main and lateral information including, but not limited to, location.

Practice Description: In the planning phase of a project, the designer should request all sewer main and lateral information including Foundation Drain Collectors (FDC's) pertaining to that project area from the Municipality / Developer. The Municipality / Developer should provide the sewer main and lateral information if available.

If the project owner completes private sewer locates, the project owner should forward all documentation to the municipality. The Municipality should retain this information and make it available upon request.

Benefits: It has been found that sewer mains and laterals can be damaged during the installation process of underground infrastructure. Damage can remain undetected

until a sewer cleaning process is initiated. The cleaning process can potentially lead to an incident if a utility had penetrated the sewer main or lateral during installation.

Sharing information will allow both parties to effectively communicate sewer main, lateral and FDC locations so underground infrastructure can be installed without damaging sewer laterals. This initiative also provides the Municipalities with updated information of sewer line locations. This practice should reduce the likelihood of damaging the sewer mains or laterals when installing underground infrastructure.

2-0 One-Call Centre Best Practices

2-1: Pro-active Public Awareness, Education and Damage Prevention Activities

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

Practice Description: The one-call centre promotes 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 one-call centre 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 CGA best practices
- Currently distribute pamphlets, recall items. Web site established, links from member sites, utility billing inserts. Participate in contractor events, shows, symposiums, etc. Invite stakeholders to centre to see operations.

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

Practice Statement: The one-call centre serves the entire Province of Ontario so that an excavator need only make one call for it's members and a facility owner/operator need only belong to a single one-call centre.

Practice Description: One-call centre programs are designed to promote ease of use for members (facility owners/operators) and for excavators. This ease of use is enhanced when a one-call centre serves a specifically defined geopolitical area that does not coincide with the service area of another one-call centre.

There are two requirements a one-call centre 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 centre and receive all appropriate notices.

2-3: Formal Agreements with Members

Practice Statement: Each member of the one-call centre abides by a written agreement that states the rights and the responsibilities of the one-call centre members and the one-call centre.

Practice Description: The terms and conditions of service provided by the one-call centre and the obligations of the member are established in a legally binding standard form Service Agreement document which is signed by both parties. The purpose of the document is to simply state the legal obligations and terms of service for both parties in a standard form contract that all members must sign. This standard form agreement should not be restrictive and there should be no unreasonable barriers to facility owners/operators signing this agreement.

2-4: One-Call Centre Governance

Practice Statement: The one-call centre is governed by a Board of Directors with input from stakeholders.

Practice Description: To ensure that a one-call centre functions to the best benefit of the entire community, it is governed by a Board of Directors with input from representatives of the stakeholders. Stakeholders are from a variety of industry types, such as facility owners/operators, contractors, designers, project owners and government representatives. Each stakeholder representative is knowledgeable in their own industry and of how it interacts with the one-call centre and all of the represented stakeholders.

2-5: Single Toll Free Number with North-American Access

Practice Statement: The one-call centre has a single toll free number with North-American access.

Practice Description: There will be only one toll free telephone number and one toll free fax number for the one-call centre to receive locate requests. These numbers have toll free North American access, meaning that a caller can telephone or fax the centre free of charge from anywhere in North America. The one-call centre will also maintain an e-mail address as an alternate means to receive locate requests.

2-6: Hours of Operation

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

Practice Description: The one-call centre 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 centre and have that request processed.

2-7: Voice Record of All Incoming Calls

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

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

2-8: Retention of Voice Records According to Applicable Statutes

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

Practice Description: Voice recordings are a factual record of the events that occurred between the caller and the one-call centre. These factual records must be maintained and accessible until expiry per the applicable statute of limitations in Ontario. Since these laws may change, no specific time period is set forth as a 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 centre has a procedure for processing requests for voice information.

2-9: Caller Feedback

Practice Statement: The one-call centre 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 centre 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.

2-10: Printed Ticket Recall

Practice Statement: The one-call centre 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. The one-call centre has the ability to produce, as necessary, a copy of a location request ticket for the appropriate statutory period.

2-11: Documented Operating Procedures, Policies, and Manuals

Practice Statement: The one-call centre has documented operating procedures, human resource policies including health and safety and training manuals.

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

2-12: Documented Owner Verification of Data Submitted by Facility Owners/Operators

Practice Statement: The one-call centre 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 centre can only work with the information related to the existence of buried facilities that its members provide. It is important that the one-call centre 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 centre. Any deletions or additions made by the member are entered into the database and documentation of the change sent back to the member for verification, prior to activation.

2-13: Flexibility for Growth and Change

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

Practice Description: A successful one-call centre maintains flexibility to respond to changes by forming and maintaining a responsive governing organization whose Board of Directors' and stakeholder representative 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 centre 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 Centre's major systems, programs and outreach activities. Such assessments help them identify stakeholder needs for future growth and development.

Many members of Boards, stakeholder group representatives and centre 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.

2-14: Meeting Between the Excavator and Facility Operator(s) Initiated by One-Call Centre Notification

Practice Statement: The one-call centre 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 centre 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 centre indicates that a meeting is requested. The one-call centre 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.

2-15: One-Call Centre Accepts Notifications from Designers

Practice Statement: The one-call centre 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 centre provides a listing of facility owners/operators directly to the designer. Once the list is identified, the one-call centre processes the request as designated by each facility owner/operator.

2-16: Locate Request

Practice Statement: The one-call centre 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 centre 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. Municipality/Community
 2. County/Region/District/Township
 3. Province
 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 co-ordinate(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, an 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 markers
 10. Railroad or pipeline markers
 11. General directions/instructions
 12. Postal code
 13. Distance to nearest cross-street
 14. Telephone number at dig site
 15. 911 address
 16. Lot and concession
 17. Map reference
 18. Pole numbers
 19. Any other pertinent references to help establish the location of the dig site

- B. The intended start date and time of the excavation
- C. Excavating by hand or machine
- D. Type of the excavation activity (e.g., boring, blasting, trenching, etc.)
- E. Whom the excavation work is being done for
- F. What is the purpose of the work (i.e., what will be installed and/or built)
- G. Excavation on public property
- H. Excavation on private property and if so, where (front, side, rear)
- I. Is the dig site pre-marked by the excavator
- J. The depth of the excavation
- K. Is a site meet requested
- L. Does the excavator want an "outline mark and fax"
- M. The status of the involved members for that request (notice, clear, suppress, cleared by look-up)
- N. Additional remarks

2-17: Practices to Reduce Over-Notifications

Practice Statement: The one-call centre 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.

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

- where due diligence and mapping accuracy permits, enable the call centre to define the proposed excavation site buffer to within approximately 800 feet (250 metres); and
- provide the facility owner/operator the ability to identify its desired area of notification, including the member specified buffer zone, to within approximately 30 metres.

2-18: Disaster Recovery

Practice Statement: The one-call centre 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 centre develops and implements an effective disaster recovery plan enabling it to continue operations in the aftermath of a disaster affecting the facility, including communication with the local emergency services to provide safe access to the centre. 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 centre. The disaster recovery plan makes provisions for the one-call centre to process emergency locate requests for the areas affected by the disaster.

The one-call centre (the primary centre) has a backup arrangement with another facility at a remote location (the secondary centre). This arrangement includes:

- Telecommunications - alternate routing schedules are in place, ready to be activated within minutes of the primary centres' failure.
- Software and Hardware - the secondary centre has compatible hardware with the primary centre. The secondary centre always has a copy of the primary's current software.

- Database - the secondary centre receives the primary centre's database including locate requests on a regular basis, preferably real-time.
- Staffing - a portion of the secondary centre's staff is cross-trained for the primary centre'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.

2-19: Remote User Interface

Practice Statement: The one-call centre provides users a means of direct, electronic entry of locate requests of comparable ticket quality to that where an operator assists information entry.

Practice Description: The one-call centre has interactive data communications sufficient to permit remote data entry for qualified 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 centre when taking a voiced-in request. This process ensures that the ticket quality is maintained for all tickets.

2-20: Accept Multiple Reference Points for Locate Requests

Practice Statement: The one-call centre 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 markers, address, street and cross street, etc.).

Practice Description: The one-call centre'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 markers, railroad or pipeline markers, valid address or street-cross street, latitude/longitude, municipality, community, county, region, township and mail address (postal code) boundaries, etc.

All stakeholders involved in the one-call process receive a corresponding benefit when the call centre 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 centre invests in systems and processes that permit inclusion of a variety of types of reference points in defining the excavation site. The one-call centre 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.

2-21: One-Call Centre Security

Practice Statement: The one-call centre 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 centre needs protection from natural disasters and other threats. Since the one-call centre is a critical link in the communication

chain between the excavating community and facilities, it is important that the one-call centre 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 centre 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 Centre.
- Passwords and protections to limit access to computers and other systems.
- Offsite storage of duplicate data base and necessary system software.

2-22: Hardware Designed to Tolerate a Single Point of Failure

Practice Statement: The one-call centre 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.

2-23: One-Call Quality Standards

Practice Statement: The one-call centre 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 centre industry to monitor the quality of service provided to the customer calling the centre. Key measurements include:

1. Speed of Answer

Process – Most call centres 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 centre 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 centre 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 centre has in place a quality of service plan that 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 or region.

D. Locate Request Delivery

The one-call centre 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 priority notice ticket transmission time (< 15 minutes)
3. Average standard 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 centre monitors the ratio of incoming locate requests to outgoing ticket transmissions. This data assists in evaluating the centre’s marketing, education, mapping, budgeting, and cost performance.

2-24: One-Call Centre Mapping

Practice Statement: The one-call centre maintains a current street centreline mapping database and updates it as new/revised map data becomes available to the centre.

Practice Description: The One-Call Centre utilizes various official mapping sources to maintain an accurate and up to date street centreline base map for the centre. This map is continuously updated with new street names and addressed segments as well as current and past place names for various political entities. The centre online base map is refreshed at least twice a year and more frequently in areas of rapid growth.

2-25: One-Call Centre is the Interface between Excavators and Registered Facility Owners for the Purpose of Receiving Locate Requests

Practice Statement: The one-call centre is the interface between the digging community (all excavators) and registered owners of buried facilities for the purpose of receiving locate requests.

Practice Description: The one-call centre makes every effort through its damage prevention promotional and educational activities to ensure that all excavators are aware of digging dangers and the necessity of requesting locates through the one-call centre prior to excavating. The one-call centre promotes the benefits of membership to all facility owners. The one-call centre implements the one-call best practices to ensure the locate request process established by the one-call centre, provides an effective interface between the excavator and registered facility owners.

2-26: All Buried Facility Owners are Members of the One-Call Centre

Practice Statement: All buried facility owners are members of the one-call centre and register the location of their notification areas with the one-call centre.

Practice Description: The one-call centre uses a comprehensive marketing strategy to make all facility owners aware of the benefits of membership in the one-call centre. The process to join is simple and barrier free. The services offered by the one-call centre are cost effective and meet the needs of facility owners.

In the event that satisfactory voluntary membership is not achieved, the one-call centre will co-operate with the ORCGA if a decision is made to establish a multi-stakeholder task force to establish model regulations for consideration by the Province of Ontario.

2-27: Excavators Contact the One-Call Centre Before Excavating

Practice Statement: Excavators contact the one-call centre to request locates prior to excavating.

Practice Description: The one-call centre educates excavators of the necessity to contact the one-call centre before they dig. The one-call centre employs best practices to ensure access to the centre at all times and by a variety of methods (phone, fax, e-mail, remote entry) to ensure that the locate request process is efficient and effective.

In the event that satisfactory voluntary participation is not achieved, the one-call centre will co-operate with the ORCGA if a decision is made to establish a multi-stakeholder task force to establish model regulations for consideration by the Province of Ontario.

2-28: One-call Centre Advises Excavators to Contact Non-Members Directly

Practice Statement: The one-call centre will advise excavators on every request that not all facility owners are members of one-call centre and that the excavator must contact non-members directly to obtain locates prior to excavating.

Practice Description: The centre advises excavators on the status for members only

for the dig site location. Until all facility owners in Ontario are members of the one-call centre, the one-call centre will advise every excavator for their request that they must contact non-members directly before they excavate.

2-29: One-Call Centre Accepts Locate Requests in Both Official Languages

Practice Statement: The one-call centre accepts locate requests in English or French and subscribes to a translation service for other common languages.

Practice Description: The one-call centre maintains sufficient bi-lingual staff on duty at the centre to accept locate requests in either English or French. The centre will subscribe to a translation service to assist with the communication of locate requests by excavators using other common languages. The ticket documentation will always be processed in English.

2-30: One-Call Centre is the Interface between Excavators and Registered Facility Owners for the Purpose of Updating the status of Locate completions

Practice Statement: The one-call centre is the interface between the digging community (all excavators) and registered owners of buried facilities for the purpose of updating the status of locate completions by members.

Practice Description: The one-call centre provides the means via its web site for members to post the status of their locate notifications on an individual ticket basis. The centre will accept requests from excavators to reissue the notification to members who have not completed their locates by the work to begin date on the original request.

2-31: One-Call Centre reminds excavators digging on private property that they should advise the centre if they are aware of any private lines situated on the property

Practice Statement: The one-call centre reminds excavators digging on private property that they should advise the centre if they are aware of any private lines situated on the property and that it is the responsibility of the property owner to ensure that their private lines are located prior to excavation.

Practice Description: The one-call centre includes a reminder to excavators digging on private property that they should make the centre aware of any private lines that exist on the property. The centre will advise the excavator that it is responsibility of the excavator to ensure that any private lines on the property are located prior to excavation. The centre will note this information in the remarks section of the notification to members. The members may then take whatever action they deem necessary with the excavator when private lines are known to be buried in the vicinity of the excavation site.

2-32: The One-Call Centre is the interface between excavators and registered facility owners for the purpose of reporting buried facilities not originally identified on the locate sheet. (New 09/2005)

Practice Statement: The on-call centre will receive calls from the excavator reporting the discovery of unidentified facilities found within the excavation area.

Practice Description: The on-call centre receives detailed verbal description of plant that has been discovered from the excavator. This information is then dispatched/forwarded to the registered facility owners. This type of request triggers an emergency notification.

3-0 Locating and Marking Best Practices

3-1: Use of Records (Revised 11/2008)

Practice Statement: Locators utilize on-site facility records at all times.

Practice Description: Facility locators use on-site records at all times. Facility records can 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.

When as-built/as-constructed records are not available on-site but there exists an electromagnetic or alternative technique to physically locate the facility, the locate should be completed by the available technique and verified where possible with the facility owner/operator.

When records are not available on-site and electromagnetic techniques cannot be used (example; no tracer wire) **or when as-built/as-constructed records are available on-site but there exists no electromagnetic or alternative technique to physically locate the facility**, it may be necessary to delay the completion of the locate while archives are accessed, requiring **immediate notification of all parties**. It can be useful for the locator to have a locate process checklist to prompt the use of records at all times when on site.

3-2: Record Corrections (Revised 11/08)

Practice Statement: If a locator becomes aware of an error or omission, then the locator provides information for the updating of 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, damages to electromagnetic facilities or omissions. Methods should be in place to notify a facility owner/operator of that error, damage or omission. The observations are submitted to the appropriate person or department. The method and timing 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, damage or omission, and
- Sketch of the change in relation to the other facilities.

Errors, omissions and damages, may include, but are not limited to, missing or non-existent records, misdrawn records, damaged or nonexistent electromagnetic facilities to physically locate the facility, changes to referenced surface features, 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. ***Additionally, 3.1, Use of Records must be considered in conjunction with this Best Practice.***

3-3: Colour Code

Practice Statement: A uniform colour code and set of marking symbols is adopted province-wide.

Practice Description: A provincial standard is adopted defining colour specifications relevant to facility type. The specifications could be similar to the accepted NULCA or APWA standards. These colours are related to specific types of underground facilities as follows:

Colour	Type of Facility/Indicator
Yellow	Gas, oil, petroleum products, compressed air and gases and other hazardous liquid or gaseous materials except water
Red	Electric power lines
Orange	Communication & CATV
Blue	Water
Green	Sewer
Purple	Reclaimed/treated water
Pink	Temporary survey markings
White	Proposed excavations

3-4: Locating Multiple Facilities

Practice Statement: A single, qualified locator used for multiple facilities.

Practice Description: It should be noted that this best practice does not suggest that all facilities be located by a single locator, but rather that conditions may exist in which locating multiple facilities with a single locator may 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 is currently being employed by a number of facility owners in Ontario to enhance safety and 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.

The use of a single locator to carry out locate requests for multiple facilities may simplify communications, with fewer links needed between excavator and locator.

3-5: Training

Practice Statement: Locators are properly trained and 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
- Workplace Safety Insurance Act and Occupational Health & Safety Act requirements
- Understanding of company safety procedures
- Written and Field Testing
- Field Training
- Refresher Training

The ORCGA Damage Prevention Technician, DPT Certification Program represents an accepted model within the locate industry.

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

3-6: Locator and Public Safety (Revised 01/2009)

Practice Statement: 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 performing a locate are identified. Appropriate measures conforming to federal, provincial, local and industry standards are established. Employees are made aware of these hazards and properly trained in worker safety standards. The following items should be considered as part of the above.

- Establish a means of communication with locator at all times.
- Upon arriving on site the locator should notify the person in charge where applicable.
- Locator should be aware of safety requirements and written emergency procedures to be followed on the project where applicable or establish his/her own.
- Considerations when conducting the hazard assessment may include:

- Traffic control
- Construction vehicular movement
- Fall hazards
- Sources of energy (overhead and other)
- Environmental factors

3-7: Locate Quality

Practice Statement: A visual inspection is completed during the 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 available 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.

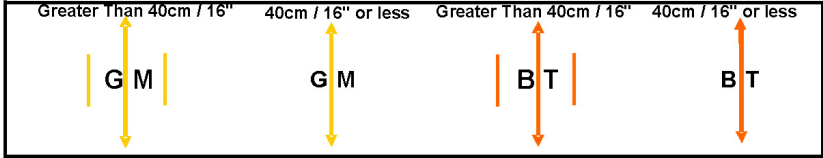
3-8: Excavation Site Conditions (Revised 06/2006)

Practice Statement: Facilities are adequately identified 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. Paint marks will be a length of 30 cm and approximately 3cm wide. 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 that can affect markings are rain, snow, vegetation, high traffic, construction, etc.

Field marks should be placed at a minimum of 3m intervals and at any directional changes. When placing marks in the field, the centre line of the facility is to be marked. Facility structures greater than 40cm/ 16 inches will have the edges of the facility marked denoting the width of the plant or structure in addition to the centre line. See examples below:



3-9: Locate Status (Revised 06/2007)

Practice Statement: 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, agreeable to all parties, may include one or more of the following:

Markings or documentation left at the job site, callback, email, fax or automated response system or other electronic media transmission.

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.

3-10: Multiple Facilities in “Joint Use” Trench

Practice Statement: Multiple facilities in a “joint-use” trench are marked individually and with corridor markers.

Practice Description: In general, the number of facilities marked on the surface equal the number of facilities buried below. All facilities within the same trench should be individually marked and identified. In situations where two facilities share the same colour 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. 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.

3-11: Locate Method Preference

Practice Statement: 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 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 spill 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 spill to any conductor in the area.

3-12: Facility Identification

Practice Statement: The facility owner/operator is identified.

Practice Description: 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 located facilities within the requested area.

The NULCA Marking Standards recommends, “In situations where two facilities share the same colour code (such as telephone or CATV) both facilities should be identified.” During completion of the locate the facility material type and size, when available, should be identified on the locate form.

3-13: Communications

Practice Statement: Communication is established amongst all parties.

Practice Description: 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. If requested by either party, written documentation between the excavator and the locator should include:

- Date, Name, Company,
- Contact numbers for all parties,
- List and the limits of the dig areas to be excavated,
- Schedule for both marking and excavating the areas, and
- 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 site meetings if the complexity of the markings requires further explanation.

3-14: Locate Record

Practice Statement: 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.

3-15: Damage Reporting

Practice Statement: A damaged facility is investigated as soon as possible after occurrence of damage.

Practice Description: Any time 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.

3-16: Workload Planning

Practice Statement: Forecasting/planning for predictable workload fluctuations is an integral part of all operating practices. A responsive 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 locate requests from excavators.

3-17: The Located Area (New 06/2006)

Practice Statement: The Located Area is properly established and identified on the Locate Form.

Practice Description: The Located Area shall be identified by a North, South, East and West boundary and shall be outlined and labeled on the sketch of the locate form. Fixed objects or measurements from fixed objects such as building lines and curbs may be used to define the Located Area. Where practicable, the Locator is expected to create limits that are at least one metre from any additional facilities, creating a "buffer zone" around the Located Area. In all cases, the scope and type of work to be performed must be clearly understood by the Locator prior to establishing the Located Area. Markings and sketched facilities shall not extend beyond the Located Area either on the locate sheet or in the field.

3-18: Identification of Demarcation Point (New 02/2008)

Practice Statement – When applicable, the locator will indicate the demarcation point of the facility owner’s plant on the locate sheet where this point is not at the point of building entry. This position will be marked on the locate sheet with a circled ‘DM’ symbol (as below).



Practice Description - When locating and marking the underground plant of the facility owner, the locator shall indicate the demarcation point of the facility being located on the locate sheet. This symbol (as above) shall be placed on top of, or as near as reasonable to, the actual physical demarcation point of the facility being located. The demarcation point is the limit of utility owned facilities. The excavator should be aware that customer or privately owned facilities may exist beyond this point. The symbol and definition should be clearly shown in the legend on the locate sheet.

3-19: Alternate Locate Agreements (New 06/2008)

Practice Statement: Alternate Locate Agreements (ALA’s) may be used providing the Facility owner and Excavator agree on the terms and conditions.

Practice Description: Alternate Locate Agreements (ALA’s) are contractual agreements between a Facility owner and an Excavator that allows the Excavator to proceed with their excavation work without receiving a traditional field locate. The Facility owner determines the terms and conditions of the ALA, including the depth, location, method of excavation and/or type of excavation. The intent of an ALA is to

ensure underground facilities are protected from damage by limiting the scope of work to the point that a field locate is not required, thus reducing demand on existing locate providers and eliminating wait times and administration for Excavators. The details of such an agreement must be stated in writing and available on the project for review upon request of the TSSA, MOL, or Facility owner's representative. Such an agreement must be communicated in writing as well to the JHSC or Health & Safety representative on the project where applicable. It is the responsibility of the Excavator to ensure that all Facility owners are requested to locate and mark their service. It is also the Excavator's responsibility to ensure that an ALA, where applicable and implemented, will not impede any safe operations regarding the other utilities not covered by that ALA and that the Health and Safety of the workers and Public Safety are safeguarded at all times. It is the Excavator's duty to ensure that the excavation work is carried out in compliance with the legislative requirements and in accordance with the ALA as stipulated between the Excavator and the Facility owner in question when and where applicable. It is the Facility owner's duty to ensure that the ALA terms and conditions will provide a level of safety equivalent to the standard locate process.

4-0 Excavation Best Practices

4-1: One-Call Facility Locate Request (Revised 06, 2006)

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 law, the excavator calls the one-call center at least four working days prior to beginning excavation procedures.

Practice Description: Increased participation in a one-call notification system provides for improved communication between excavators and facility operators necessary to reduce damage. The committee supports the notion of mandatory membership by utility owners in a one-call notification system. 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. Laws in 41 states call for a minimum of 2 days prior and laws in 16 states call for no more than 10 days. There are currently no such laws in Ontario. There does exist however guidelines published by TSSA for excavations in the vicinity of pipelines.

To avoid unnecessary waste of resources, a project and/or portion of the work for which a locate has been requested for and not yet provided, has been cancelled, deferred for an extended period of time, or just altered in the queue of execution, then that locate request should be cancelled.

References: Existing state laws, including Ohio and West Virginia, TSSA Guidelines.

4-2: Privately Owned Facility Awareness (New 02/2008)

Practice Statement - Prior to excavating, the excavator must be aware that privately owned buried facilities may exist within the work area and should request the private facility owner (e.g. landowner) to locate their underground facilities.

Practice Description - Privately owned underground facilities may not be marked by representatives of the public facility owners beyond the demarcation point of each facility (eg. Private Property). The private facility owner is responsible for identifying the location of these buried facilities. Identification activities may include, but are not limited to: provision of maps, provision of engineering drawings from previous workings and/or retaining or authorizing the deployment of a private locator.

References

- Occupational Health and Safety Act Section 228

4-3: White Lining

Practice Statement: 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 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. The practice was introduced in Ontario in 1996. This process is not recommended in winter conditions where snow is prevalent.

References: Existing state laws, including California, Missouri, New Jersey and others. The state laws evolved from a Best Practice developed by the American Gas Association.

4-4: 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 assigned 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:

- One call practice in Ontario since 1996, which evolved from the US.
- Existing state laws, all 50 states have one-call centers and/or state statues that require one call center participation and utilization
- Existing operating procedures from various US one-call centers.

4-5: Pre-Excavation Meeting

Practice Statement: When necessary, the excavator or the locator may request a pre-excavating meeting at the jobsite just prior to the actual marking of facility locations. Such pre-excavating 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. Potential facilities include, but are not limited to, high-pressure gas, high voltage electric, fiber optic communication, and major pipe or water lines.

References:

- Existing National Energy Board (NEB) regulations.

- Existing practice amongst excavators, utility companies and locators.

4-6: Facility Relocations

Practice Statement: The excavator coordinates work with the affected facility owner/operator and the project owner where temporary or permanent interruption of a facility owner/operator's service is required.

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.

Reference: Existing practice amongst excavators, utility companies and project owners.

4-7: Separate Locate Requests (Revised 09/2005)

Practice Statement: Every excavator on the job has an appropriate locate form 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. It is preferable for each excavator to obtain their own individual locate before excavating to ensure that the specific areas have been appropriately marked by any affected underground facility owner/operator. However; where a single locate is relied upon by multiple users on the same project, it is the responsibility of the excavator to ensure that the locate is appropriate for the intended excavation, giving due consideration to the limits of the located area, depth of excavation, ticket life, and the existence of any facilities installed since the locate was performed.

Reference: Existing provincial law i.e. Occupational Health & Safety Act, and the Technical Standards & Safety Act, and the corresponding Act Regulations.

4-8: One-Call Access (24x7)

Practice Statement: The excavator has access to the One-Call centre 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 require 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.

Current Practice Deficiency: There are utilities that are not members of the One-Call centre and should be mandated to join. Locates are currently not available on a 7x24 basis for all utilities.

Reference: Existing states laws. Existing practices of Ontario One Call Ltd.

4-9: Positive Response

Practice Statement: The excavator is notified in writing 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 shown on a locate sheet provided to the excavator, or is notified verbally and in writing, if possible, that an “all clear” situation exists. This takes place within three working days of the notification to the facility owner/operator of the locate request or a mutually agreed upon date between the locator and the excavator.

Practice Description: If the One-Call Centre or 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 from the One-Call Centre or the facility owner/operator will include a written “all clear” response. If an excavator has knowledge of the existence of an underground facility and has received an “all clear,” response, the excavator should notify the One-Call Centre and the facility owner/operator if known, that a conflict does indeed exist. The One-Call Centre and the facility owner/operator should make marking these facilities a priority before excavation begins.

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.

The excavator should maintain written records of all locates requested and received.

References:

- Existing state laws, including California, Maryland, Nevada and others and Ontario utility companies excavating guidelines.
- Existing operating procedures for Ontario One Call Ltd.

4-10: Facility Owner/Operator Failure to Respond (Revised 05/2005)

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 provincial 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. The one-call center contacts the facility owner/operator to ascertain the nature of the delay and heightens the locate status to an overdue locate. Where practicable, the facility owner/operator will respond with the locate and supporting documentation within 2 hours.

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.

References: Existing TSSA Guidelines.

4-11: Locate Verification

Practice Statement: Prior to excavation, excavators verify the limits of the locate markings correspond with the limits of the proposed excavation. The excavator, to the best of their ability, checks for readily visible, unmarked facilities. If a locate is found to be incomplete, inaccurate, or any other discrepancies are found, the excavator may call the locator directly. If the locate is not corrected within 4 hours, the excavator can escalate the locate to the One Call Center as an overdue locate.

Practice Description: Upon arrival at the excavation site prior to beginning the excavation, the excavator ensures that the limits of the locate are clearly identified on the locate. The excavator verifies that all facilities have been marked, reviewing colour codes if in doubt. The excavator checks for readily visible signs of underground facilities, such as pedestals, risers, meters, new trench lines and service feeds from buildings and homes. Where readily visible evidence of unmarked facilities exists, the excavator contacts the project owner 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.

4-12: Work Site Review with Company Personnel

Practice Statement: Prior to starting work, a competent person reviews the location of underground facilities with site personnel. Any locate documentation is kept on the project site.

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.

References: Existing practice by excavators under the Occupational Health and Safety Act and Regulations for Construction Projects.

4-13: 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. Such names and numbers shall be displayed on the locate sheet.

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.

References: None – There is a current deficiency in the standardization of practices.

4-14: Facility Avoidance

Practice Statement: The excavator uses reasonable care to avoid damaging underground facilities.

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

References:

- Existing Occupational Health and Safety Act and Regulations.
- Guidelines published by the UCAO, TSSA and EUSA.

4-15: Federal and Provincial Regulations

Practice Statement: The excavator adheres to all applicable federal and provincial occupational health and safety legislation and regulations.

Practice Description: It is important to include reference to worker safety and training in the best practices. Excavators are required to comply with federal and provincial 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 regulations applicable to the protection of underground facilities, workers and the public.

References:

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

4-16: Marking Preservation

Practice Statement: The excavator, where practical, 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.

References: Existing practice by excavators and facility owners/operators.

4-17: 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.

References: Existing practice amongst reputable excavators.

4-18: Excavation Tolerance Zone

Practice Statement: The excavator observes a tolerance zone which is comprised of the width of 1 metre from the centerline of a located cable or conduit and 1 metre from either side of the outside edge of the underground facility on a horizontal plane. This practice is not intended to preempt any existing provincial or federal requirements.

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

References: Existing guidelines for excavating in the vicinity of underground facilities published by the TSSA, UCAO and EUSA.

4-19: 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, 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-invasive methods that manually expose a facility are considered “safe excavation practices”. Some guides for excavation in the vicinity of utilities specifically allow for the use of power excavating equipment for the removal of pavement and sidewalk but not curbs or base materials. Differing geologic conditions and weather related factors must be taken into consideration when using types of excavation within the tolerance zone.

References: Existing excavation guidelines published by the TSSA and various utility owners/operators.

4-20: Unidentified Facilities (Revised 09/2005)

Practice Statement: The excavator notifies the facility owner/operator directly or through the one-call system if an inaccurately marked or unidentified underground facility is found. Following this notification, the excavator may continue work if the excavation can be performed without damaging the facility.

Practice Description: When an excavator finds an inaccurately marked or unidentified 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 practice amongst reputable and responsible excavators.

4-21: 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 Regulations for Construction Projects under the Occupational Safety and Health Act have also addressed this issue.

References: Existing provincial laws.

4-22: Locate Request Updates (Revised 05/2005)

Practice Statement: The excavator calls the one-call center to refresh the ticket when excavation continues past the life of the ticket. This recognizes that it is a best practice to define ticket life. Ticket life would best be 30 calendar days **from the date the locate was performed as noted on the locate sheet**, unless otherwise specified by provincial or federal law.

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 that covers a large area and will progress from one area to the next over a period of time is broken into segments as agreed between the excavator, facility owner/operator and/or the locator 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.

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.

References: Existing practices amongst excavators, facility owners/operators and locators.

4-23: Facility Damage Notification

Practice Statement: An excavator discovering or causing damage to underground facilities notifies the facility owner/operator as identified on the locate form. All breaks, leaks, nicks, dents, gouges, groves, or other damages to facility lines, conduits, coatings or cathodic protection will be reported immediately.

Practice Description: 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.

References: Existing practice amongst responsible and reputable excavators.

4-24: 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, property or the environment, the excavator responsible immediately notifies the appropriate authorities and the facility owner/operator.

The excavator takes reasonable measures to protect workers and others in immediate danger; the general public; property, and the environment.

Practice Description: 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 the situation to protect workers, the public, 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.

References:

- Existing practices by responsible and reputable excavators.
- Existing TSSA guidelines.

4-25: Emergency Excavation (Revised 06, 2006)

Practice Statement: In the case of an emergency excavation, the excavator notifies the one-call center and facility owner/operator and requests an emergency locate. The current practice in Ontario is a two-hour response time by the facility owner/operator.

Practice Description: Provincial regulations require excavators to request locates including emergency situations.

An Emergency excavator locate request is defined as a loss of essential service by a utility and an excavator work crew is on site or dispatched, or there is an imminent safety hazard requiring a locate response by facility owners within two (2) hours."

References:

- Existing provincial regulations.
- Existing practice amongst excavators and facility owner/operators.
- Existing practice at Ontario One Call (ON1CALL)

4-26: Backfilling

Practice Statement: The excavator protects all facilities from damage when backfilling an 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:

- Existing practice amongst excavators.
- Existing provincial and federal regulations.

4-27: 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.

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 150 mm or more and lateral measurement changes of greater than 300 mm. 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.

References: Existing practice amongst responsible and reputable facility owner/operators, and excavators.

4-28: Vacuum Excavation Definition (New 09/2005)

Practice Statement: Vacuum excavation is defined as a mechanical means of soil extraction through vacuum when using water or air jet devices for breaking ground. This method of excavation is commonly referred to as “soft excavation technology” and is commonly accepted as being equivalent or safer than hand digging within the “tolerance zone” around underground facilities.

Practice Description: Vacuum excavation may be used to excavate safely around utilities if the equipment has been designed and engineered for excavating. The equipment is used following the manufacturer’s recommended practices, documented procedures and meet facility owner guidelines. Only competent and qualified workers shall operate vacuum excavation equipment.

4-29: Operator Competency – Vacuum Excavating (New 09/2005)

Practice Statement: Vacuum excavation equipment shall only be operated by a “competent worker” as defined by OH&S regulations for Construction Projects. The operator must have knowledge, training and experience to perform the work, be familiar with the OH&S Act and the regulations that apply to the work and have knowledge of all potential or actual danger to health and safety in the work place. It is a best practice that workers have training recognized by the industry, defined work practices and manufacturer’s recommended procedures specific to the equipment they are operating.

Practice Description: Vacuum excavation equipment operators should have also completed at a minimum the training outlined by the “EUSA Safe Practice Guide for Excavating With Hydrovacs in the Vicinity of Underground Electrical Plant” and training specific to any known facilities in the area of excavation.

4-30: Safe Operation of Vacuum Excavation Equipment (New 09/2005)

Practice Statement: Vacuum excavation can be used to excavate safely around utilities if the equipment has been designed and engineered for vacuum excavating according to the manufacturer. Equipment must be operated in accordance with recognized practices and procedures that provide necessary levels of worker and public safety and prevent damage to underground utilities.

Practice Description: Excavators shall have as a minimum:

- A documented company Safety Program in place which can be made available for review on request by a representative of a facility owner.
- Written vacuum excavation Job Procedures must be in place and made available for review on request by a representative of a facility owner.
- The contractor’s equipment specifications and or job procedures must comply with Appendix 2 of the “TSSA Guidelines for Excavations in the Vicinity of Gas Lines” when working around buried natural gas infrastructure, and the “EUSA Safe Practice Guide for Excavating With Hydrovacs in the Vicinity of Underground Electrical Plant”

References: EUSA Safe Practice Guide Excavating with Hydrovacs in the Vicinity of Underground Electrical Plant.

4-31: Frozen Ground Excavation (New 09/2005)

Practice Statement: A preferred method for excavating within the tolerance zone around any underground utility in frozen ground is to use a hydrovac designed and built for this purpose.

Practice Description: Conventional excavation methods in frozen ground pose a risk to buried facilities if the facility is surrounded by frozen ground. The use of conventional mechanical excavation equipment cannot only damage plant via direct contact but can also move frozen ground encasing plant; potentially causing damage.

The best practice for excavating in the tolerance zone in frozen ground is to use a hydrovac with heated water not exceeding 45 degrees C at the wand tip. This is currently the practice used by many vacuum excavators.

4-32: Utility Owner Acceptance of Vacuum Excavation Practices (New 09/2005)

Practice Statement: Each utility has a specific criterion for safe excavating practices. Some utilities view Vacuum Excavation as the equivalent to hand digging when exposing their utility and others have restrictions on their use. It is recommended excavators contact the utility owners to determine the extent of their restrictions for the use of this method of excavation around their plant.

Practice Description: Every excavator who wishes to utilize vacuum excavation as a method to excavate within the “tolerance zone” of any underground plant should contact the owner of the utility to determine the specific criteria they deem acceptable prior to starting the excavation. Some utilities will accept this practice as the equivalent to hand digging; others may have very specific procedures and operating criteria that need to be followed.

Utility owners generally recognize the benefits for damage prevention by utilizing this process. Utility owners should work together to establish a common set of standards, process and procedures that can be accepted by all damage prevention stake holders.

4-33: Protection of Survey Infrastructure (New 02/2008)

Practice Statement: Every excavator is responsible for recognizing and ensuring the integrity of survey infrastructure.

Practice Description: Every excavator should recognize the importance of not disturbing monumented boundaries. Utility infrastructure must be installed to avoid disturbing survey infrastructure. Survey infrastructure may include iron bars, iron pipes, wood posts, cut stone monuments, rock mounds, rock bars and building corners.

References:

1. Because of their significance, survey monuments are protected by both federal and provincial law.

The **Criminal Code of Canada R.S. 1985, c. C-46** under Part XI, Sec. 442 and 443 states, “Every one who willfully pulls down, defaces, alters or removes anything planted or set up as the boundary line or part of the boundary line of land is guilty of an offence punishable on summary conviction.”

Furthermore, the **Surveys Act, R.S.O. 1990, c. S.30**, restricts the setting of survey bars to Ontario Land Surveyors who are licensed by virtue of the having met strict academic and experience requirements.

2. Petroleum and Natural Gas Act (British Columbia)

Geophysical Exploration Regulation, Section 7- Survey monuments
http://www.qp.gov.bc.ca/statreg/reg/P/PetNatGas/361_98.htm#1

4-34: Excavation and Public Safety (New 01/2009)

Practice Statement: Excavations are performed safely.

Practice Description: It is the responsibility of the owner/operator and Excavator to establish when and how the excavation will be performed. All hazards associated

with excavating are identified. Appropriate measures conforming to federal, provincial, local and industry standards are established. Employees are made aware of these hazards and properly trained in worker safety standards. Appropriate safeguards are put in place to protect the public.

The following items should be considered as part of the above.

- All locates for the area being excavated have been received and are consistent between paper and physical markings.

- All appropriate personnel are familiar with locates and markings for the excavation being conducted.

- Where applicable, consult with the facility owners about uncovering, support requirements and backfilling procedures of all underground facilities.

- Considerations for excavations may include:
 - Soil classification
 - Traffic control
 - Construction vehicular movement
 - Fall hazards
 - Adjacent structures and/or facilities
 - Maintaining clear distances on top of excavations for materials and equipment
 - Sources of energy (overhead and other)
 - Environmental factors

Reference:

- Part III Excavations, of the Regulation for Construction Projects 213/91
- Technical Standards & Safety Authority Guidelines
- Electrical Safety Authority Guidelines

5-0 Mapping Best Practices

5-1: One-Call Center Responsibilities and Use of Mapping (Reformat 03/2006)

Practice Statement: The land base used by the One Call Centre mapping system should be accurate and kept up to date with new information as it becomes available from source suppliers. Facility owners/operators should provide regular updates of their notification mapping coverage to ensure the most current information is utilized in the system. Ideally, the land base used is available to the public and can produce a ticket for the smallest practical geographical area utilizing latitude/longitude to describe the location.

Practice Description: The Provincial land base should be the most current, precise and contain the most complete coverage available. It should be geographically correct to a reasonable degree as well being cost effective. The meta-data information should be available to permit two way conversion and/or exchange of data. A single standard geographic reference should be utilized.

There must be a process in place to keep the land base current (both graphics and attributes) with regular updates and maintenance. This process should be as automated as possible to avoid user errors while being cost effective. The database is promptly updated as information is provided or becomes available from the facility owner/operator. The system should be able to accept information in standard file format with minimal human intervention. (The graphic database refers to the member notification area coverage)

The mapping system should be able to produce a ticket for the smallest practical geographical area suitable to the member's requirements. There needs to be flexibility within the system to handle the various sources of information contained.

Land base should be made available for public viewing (excavators, project owners, homeowners, etc.) to validate limits of dig areas. The land base and database should also be available to the one-call center membership for the update of member database information.

Current Practice:

- The current Ontario One Call Ltd. map is a composite data set using DMTI Spatial CanMap, and the Ontario Road Network (ORN) as its base, with additional information from various regions and members (e.g. Bell & Union Gas, York, Durham, Hamilton, Peel, Waterloo Chatham-Kent, Ottawa, Middlesex, etc.).
- Ontario One Call Ltd uses decimal latitude - longitude as the default projection.
- The database consists of single line road segments with address range information as attributes based on Municipal and regional coverage.
- Ontario One Call Ltd.'s current plan is to update the map on a semi annual basis. There are tools in place to minimize the amount of manual effort required to verify new streets from map sources and standard file formats are used to minimize human intervention. A process is in place to provide a more frequent update on an as required basis by city - subject to availability of data. Facility owner updates are made within 10 days of receipt.
- Ontario One Call Ltd. members have a choice on the type of coverage - franchise/jurisdiction area, selected coverage based on physical location of plant.

- The smallest area is a single road segment, although this is limited to both sides of the road.

5-2: Locator Responsibilities and Use of Mapping (Reformat 03/2006)

Practice Statement: Locators use maps to assist in finding the excavation site and to assist in determining the general location of the buried facility. Where discrepancies occur between mapping and facilities location determined by equipment, the locator should notify the owner/operator and the One-Call Centre.

Practice Description: It is critical that the locators are trained in reading facilities distribution maps and associated symbology to assist in determining the location of the buried facilities. The locator utilizes both locating equipment and mapping to provide locates. Where there is a discrepancy between the mapping and the location as determined by locating equipment, the locator must notify the facility owner/operator of the issue and also provide such feedback to the One-Call Centre of the issue. The facility owners should be responsible for verifying any such discrepancies as part of editing their mapping databases.

Current Practice:

- The locator can contact the Ontario One Call Ltd. Solutions Centre to log their discrepancies.
- Most utilities have an internal process for updating their facilities mapping when notified of a discrepancy.

5-3: Excavator's Responsibilities and Use of Mapping (Reformat 03/2006)

Practice Statement: The excavator provides accurate excavation location information to the one-call centre.

Practice Description: The excavator takes responsibility for giving accurate excavation 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. A list of requirements is found in Best Practice 2-15.

If the excavator cannot meet the above criteria, the excavator directly coordinates with the one-call center to establish the excavation area for the purposes of description on the locate form. At times, it may also be required for the excavator to coordinate with the facility locator in order to establish the location.

5-4: Facility Owner/Operator Responsibilities and Use of Mapping (Revised 06/2008)

Practice Statement: The facility owner/operator collects detailed location information on existing and newly constructed facilities and provides mapping data to the one-call center and the locator on a consistent basis.

Practice Description: The facility owner/operator should ensure that as-built drawings are of sufficient detail and show an accurate relationship to some defined reference system in order that the location of the plant can be re-established at a later date (i.e. physical permanent structure, survey monuments, horizontal coordinates). The facility owner/operator should provide the one-call center and locator with data

(i.e. Electronic or paper records, fiche, or other indexing of underground facilities) that will allow proper ticket creation and notification of excavation activities near the facility owner/operators' infrastructure and allow the locator to accurately mark the underground facility. Stakeholders should be encouraged to provide digital information.

The facility owner/operator should provide the one-call center and locator with data (i.e. Electronic or paper records, fiche, or other indexing of underground facilities) that will allow proper ticket creation and notification of excavation activities near the facility owner/operators' infrastructure and allow the locator to accurately mark the underground facility. Stakeholders should be encouraged to provide digital information.

The mapping system standards should be consistently applied across the owner/operator's facilities, although various plant owner/operators have standards that could differ from each other.

The facility owner/operator should capture 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 in an **as-built** state 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.
 - h. SUE process will record actual locations prior to design of new installations

Current Practice:

- Ontario One Call Ltd. accepts either digital or hard copy information of single line data. The onus is on members to provide updates and is facility owner-specific (format, media, etc.).
- There are three levels of Ontario One Call Ltd. coverage available to facility owners:
 - Franchise coverage – wide area notifications to municipalities;
 - Selective area coverage – tight polygons and/or polylines at street level (single line representation);
 - Corridor coverage – long linear coverage based on buffers surrounding the plant with spikes touching local road segments, addresses, etc.
- Facility information is currently provided to locators by facility owner/operators in their designated formats.

- There is a standard ‘common file’ for spatial information for members who wish to exchange digital information.
- Composite Utility Map (Toronto) – enables effective future management of infrastructure (pre-requisite of cutting permit). Requires standards: coordinate system, known datum, map projection, etc, and has been utilized in the “former City of Toronto” since 1933. It is currently under development for the municipalities that are now amalgamated under the City of Toronto.

Reference:

Port Alberni, BC

Engineering Specifications Manual, Section B-2 As-Built Records

www.city.port-alberni.bc.ca/CityHall/Engineering/EngSpecBook/index.htm

5-5: Project Owner Responsibilities and Use of Mapping (Reformat 03/2006)

Practice Statement: The project owner provides accurate information on the scope of work and determines the starting and ending points, ideally by providing basic coordinates which define the centerline or area of construction.

Practice Description: The project owner provides the excavator with accurate location information on the proposed excavation area and scope of work This information includes: a street address, street intersection, legal description, a starting point, ending point and on which side of the property (North, South, East, West, front, back, rear, sides, etc.) distance from nearest intersection or other acceptable one-call format and latitude/longitude if feasible.

Current Practice:

- Project owner provides information to excavator which is referenced to the call centre map.
- Today, “starting and ending points” tend to be descriptions - not coordinates, however greater use of mapping technologies will facilitate this information being provided.
- There is currently a variety of referencing methods for tying-in proposed construction (C/L, P/L, etc.) which is facility owner specific and may/may not be tied to universal survey control points.
- Current Ontario One Call Ltd’s system operates on a road segment basis.

6-0: Compliance Best Practices

6-1: Public Education (Reformat 03/2006)

Practice Statement: Public education programs are used to promote compliance.

Practice Description: The ORCGA is charged to promote comprehensive and appropriate programs to educate all stakeholders about the existence and content of the damage prevention practices, laws and regulations. This education will be documented and published. This is not meant to discourage individual stakeholders from providing educational programs.

References: The Ontario Regional Common Ground Alliance will develop, through its Public Education Best Practice group, an education platform which allows best practices to be understood and followed throughout the industry. Education activities will be documented.

6-2: Enforcement Education (Reformat 03/2006)

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 best practices, laws or regulations has occurred, mandatory education is an effective alternative. Mandatory education as an enforcement tool promotes compliance with damage prevention best practices.

References: Technical Standards and Safety Authority: TSSA delivers educational seminars to individual companies where TSSA and the company agree that this is an appropriate tool. Where the company demonstrates appropriate levels of safety culture, this education seminar may act to avoid an elevated enforcement action such as an administration penalty or prosecution.

6-3: Incentives (Reformat 03/2006)

Practice Statement: Damage prevention programs include incentives to promote compliance with laws, regulations and best practices.

Practice Description: Incentives can include, but are not limited to, ease of access to one-call system, One Call membership and participation considerations, representation on one-call boards, reasonable enforcement of regulations, safety and liability protection, preferred access to contract bidding, and insurance benefits.

- Safety and Liability Protection: Demonstrated adherence to the Best Practices will provide increased safety and liability protection for all industry members.
- Preferred Access to Contract Bidding: To provide incentive to excavators to demonstrate compliance to Best Practices, it is recommended that Municipalities and others who hire excavation contractors ensure they build a process into their contract awarding process which accomplishes this.

They will also ensure that their contracts include incentives and/or penalties regarding performance requirements.

- **Insurance Benefits:** To provide incentive to follow best practices, it is recommended that the insurance companies develop a system which allows them to provide financial incentives to companies with a demonstrated positive safety culture.
- **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 and demonstrated safety culture, without imposing unnecessarily high transaction costs on any participant, including the enforcement authority.

References: TSSA, MOL, ESA: These regulatory agencies have agreed that they will apply reasonable enforcement of regulations as stipulated.

6-4: Penalties (Reformat 03/2006)

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

Practice Description: Within the context of Regulations, there are specific provisions for penalties for failure to comply with the damage prevention laws and regulations.

A penalty system includes education as an alternative or supplement to other penalties (see above).

A penalty system also uses a tiered structure to distinguish violations by the level of severity or repeat offenses (e.g., Legal Orders, Tickets, Administrative Penalties, Prosecution Fines, Imprisonment).

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

References:

- **Technical Standards and Safety Act 2000 Section 21 (1):** “If an inspector finds that any provision of this Act, the regulations or a Ministers order is being contravened, or that a thing under this Act is unsafe or is not being operated or used in accordance with the authorization relating to it, the inspector may,
 - (a) serve the person he or she believes to be the contravenor or that person’s supervisor or employer, or both, with a order in writing directing compliance with the provision or authorization and may require that the terms of the order be carried out forthwith or within such other time specified in the order; or
 - (b) seal any thing to which this Act or the regulations apply where there is or may be a demonstrable threat to public safety, whether or not the thing is subject to an authorization, c.16, s.21 (1).
- (1) Every person who,
 - (a) contravenes or fails to comply with any provision of this Act, the regulations or a Minister’s order;

- (b) knowingly makes a false statement or furnishes false information under this Act, the regulations or a Minister's order;
 - (c) contravenes or fails to comply with a term or condition of an authorization;
 - (d) contravenes or fails to comply with an order or requirement of an inspector or obstructs an inspector,
- is guilty of an offence and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both, or, if the person is a body corporate, to a fine of not more than \$1,000,000. 2000, c.16, s.37(1).

Duty of director or officer

- (2) Every director or officer of a body corporate has a duty to take all reasonable care to prevent the body corporate from committing an offence under subsection (1). 200, c.16, s.27 (2).

Offence

- (3) Every director or officer of the body corporate who has a duty under subsection (2) and who fails to carry out that duty is guilty of an offence and on conviction is liable to a fine of not more than \$50,000, or to imprisonment for a term of not more than one year, or to both. 2000, c.16, s.37 (3).

Separate Offence

- (4) Where a person contravenes any of the provisions of this Act, the regulations, a Minister's order or any notice or order made under them on more than one day, the continuance of the contravention on each day shall be deemed to constitute a separate offence. 2000, c.16, s.37(4).

Administrative Penalty

- (5) A person against whom an administrative penalty has been levied by a designated administrative authority or, in the absence of such authority, by the Minister does not preclude a person from being charged with, and convicted of, an offence under this Act for the same matter. 200, C.16, s.37 (5).

Ontario Regulation 210/01 (Pipeline Regulations) existing under the Technical Standards and Safety Act, 2000

9 (1) No person shall dig, bore, trench, grade, excavate or break ground with mechanical equipment or explosives without first ascertaining from the licence holder the location of any pipeline that may be interfered with.

As a note – Guidelines have been produced by TSSA with consultation from industry which provide acceptable practices for excavating in the vicinity of pipelines. These Guidelines are on the TSSA web site at www.TSSA.org.

9 (2) The licence holder shall provide as accurate information as possible on the location of any pipeline within a reasonable time in all the circumstances.

As a note – Guidelines have been produced by TSSA with consultation from industry which define “accurate” as within 0.9m. The Guidelines also provide parameters for “reasonable time”. These Guidelines are on the TSSA web site at www.TSSA.org

- 9 (3) No person shall interfere with or damage any pipeline without authority to do so.

- **Occupational Health and Safety Act, RSO, 1990 Chapter 0.1, as amended:**

“Where an inspector finds that a provision of this *Act* or the regulations is being contravened, the inspector may order, orally or in writing, the owner, constructor,

licensee, employer, or person whom he or she believes to be in charge of a workplace or the person whom the inspector believes to be the contravener to comply with the provision and may require the order to be carried out forthwith or within such period of time as the inspector specifies.”

- (1) Every person who contravenes or fails to comply with,
 - (a) a provision of this Act or the regulations;
 - (b) an order or requirement of an inspector or a Director; or
 - (c) an order of the Minister,is guilty of an offence and on conviction is liable to a fine of not more than \$25,000 or to imprisonment for a term of not more than twelve months, or to both.
- (2) If a corporation is convicted of an offence under subsection (1), the maximum fine that may be imposed upon the corporation is \$500,000 and not as provided therein.
- (3) On a prosecution for a failure to comply with,
 - (a) subsection 23 (1);
 - (b) clause 25 (1)(b), (c) or (d); or
 - (c) subsection 27 (1),it shall be a defense for the accused to prove that every precaution reasonable in the circumstances was taken.

O.Reg 213/91 as amended by O.Reg 631/94, O.Reg 143/99, O.Reg571/99, O.Reg 145/00, and O.Reg 527/00. R.R.O 1990, Reg 834

228. (1) Before an excavation is begun,
- (a) gas, electrical and other services in and near the area to be excavated shall be accurately located and marked; and
 - (b) if a service may pose a hazard, the service shall be shut off and disconnected. O. Reg. 213/91, s. 228 (1).
 - (2) The employer who is responsible for the excavation shall request the owner of the service to locate and mark the service. O. Reg. 213/91, s. 228 (2).
 - (3) If a service may pose a hazard and cannot be shut off or disconnected, the owner of the service shall be requested to supervise the uncovering of the service during the excavation. O.Reg. 213/91, s. 228 (3).
 - (4) Pipes, conduits and cables for gas, electrical and other services in an excavation shall be supported to prevent their failure or breakage. O.Reg. 213/91, s. 228 (4).

ESA

Electrical Act, 1998 – Part VII Electrical Safety

113.20 (1) Every person,

- (a) that refuses or neglects to comply with section 113 or with any regulation, plan or specification made under its authority is guilty of an offence and on conviction is liable to a fine of not more than

\$50,000 or to imprisonment for a term of not more than one year, or to both;

(b) that refuses or neglects to comply with an order issued by the Authority under subsection 113 (5) is guilty of an offence and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both, and a further fine of not more than \$5,000 for each day upon which the refusal or neglect is repeated or continued;

(c) that refuses or neglects to comply with subsection 113.14 (7) or (12) or disturbs or interferes with an inspector or other officer in the performance of a duty the inspector or officer was appointed to perform under this Part is guilty of an offence and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both;

(d) that contravenes or fails to comply with subsection 113.2 (1) is guilty of an offence and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both, and a further fine of not more than \$5,000 for each day upon which the offence is repeated or continued;

(e) that contravenes or fails to comply with any regulation made under the authority of clause 113.22 (1) (e) is guilty of an offence and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both, and a further fine of not more than \$5,000 for each day upon which the offence is repeated or continued;

(f) that contravenes or fails to comply with a restriction, limitation or condition of an authorization is guilty of an offence and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both, and a further fine of not more than \$5,000 for each day upon which the offence is repeated or continued;

(g) that knowingly makes a false statement or furnishes false information to a Director under this Part is guilty of an offence and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both. 2005, c. 33, s. 7 (3).

Same, corporations

(2) A corporation that is guilty of an offence described in subsection (1) is liable, on conviction, to a fine of not more than \$1,000,000. 2005, c. 33, s. 7 (3).

Electricity Act, 1998

ONTARIO REGULATION 22/04

Amended to O. Reg. 149/05

Electrical Distribution Safety

Proximity to distribution lines

10. (3) Before digging, boring, trenching, grading, excavating or breaking ground with tools, mechanical equipment or explosives, a contractor, owner or occupant of land, buildings or premises shall, in the interests of safety, ascertain from the distributor responsible for the distribution of electricity to the land, building or premises the location of any underground distribution line that may be interfered with in the course of such activities. O. Reg. 22/04, s. 10 (3).

(4) The distributor shall provide reasonable information with respect to the location of its underground distribution lines and associated plant within a reasonable time. O. Reg. 22/04, s. 10 (4).

6-5: Enforcement by Existing Authority (Reformat 03/2006)

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

Practice Description: Enforcement authorities have the resources to enforce the laws and regulations. Experience has demonstrated that enforcement of the laws and regulations that did not identify a specific authority have 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, 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;
- An initial informal means of contesting a notice of violation; and
- A published violation review process and violation assessment considerations.

References: TSSA, ESA and MOL have all characteristics noted above.

Electricity Act, 1998 – Part VII Electrical Safety

113. (1) The Authority, subject to the approval of the Lieutenant Governor in Council, may make regulations,

(a) prescribing the design, construction, installation, protection, use, maintenance, repair, extension, alteration, connection and disconnection of all works and matters used or to be used in the generation, transmission, distribution, retail or use of electricity in Ontario;

(b) prohibiting the use in Ontario of any such works or matters until they have been inspected and approved;

(c) prohibiting the advertising, display, offering for sale, or other disposal, and the sale or other disposal, publicly or privately, in Ontario, of any such works or matters unless and until they have been inspected and approved, and prescribing the precautions to be taken in the sale or other disposal of such works or matters and the warnings and instructions to be given to purchasers and others in advertisements and by circular or otherwise to prevent their use in such manner or under such conditions as may be likely to result in undue hazard to persons or property;

(d) providing for the inspection, test and approval of all such works and matters before being used for any such purposes;

(e) adopting by reference, in whole or in part, with such changes as the Authority considers necessary or advisable, any code or standard and requiring compliance with any code or standard that is so adopted;

(f) requiring compliance with any code or standard under a rule of a person retailing electricity to such works. 1998, c. 15, Sched. A, s. 113 (1); 2004, c. 19, s. 12 (3).

6-6: Structured Review Process (Reformat 03/2006)

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

Practice Description: 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. A structured review process must be outlined in writing which indicates:

- who receives reports of alleged violations,
- who investigates the reports,
- possible outcomes of the investigation,
- who conducts 1st tier (informal) hearings,
- possible outcomes of 1st tier hearings, and
- appeal rights following a 2nd tier (formal) hearing.

References:

- **Technical Standards and Safety Act 2000 Section 21 (1):** “Any person affected by an order under clause 21 (1)(a), the affixing of a seal under subsection 18(4) or clause 21(1)(b) or a requirement to pay fees under clause 19(1)(b) may appeal at any time to a director. 2000, c.16, s.22(1).

When required to be in writing

- (2) The appeal is not required to be in writing but if a director so requires, the grounds for the appeal shall be specified in writing before the appeal is heard. 2000, c.16, s.22(2).

Hearing

- (3) On receiving an appeal, the director shall hold a hearing as soon as is reasonably possible, but such an appeal does not affect the operation of the order appealed from pending disposition of the appeal. 2000, c.16, s.22(3).

Decision

- (4) After a hearing, the director may,
- (a) substitute his or her findings for that of the inspector;
 - (b) revoke the order if the director is satisfied,
 - (i) that a demonstrable threat to public safety does not or may not exist, or
 - (ii) that all provisions of this Act, the regulations or a Minister’s order are being complied with or that the thing is being operated in accordance with the authorization relating to it; or
 - (c) affirm the order if the director is not satisfied under clause (b), 200, c.16, s.22(4)

Appeal

- (5) Where the director affirms an inspector's order under clause (4) (c), the affected person may appeal to the Divisional Court under section 11. 2000, c.16, s.22 (5).

Occupational Health and Safety Act RSO, 1990 Chapter 0.1 as amended
61(1) Any employer, constructor, licensee, owner, worker or trade union which considers himself, herself or itself aggrieved by any order made by an inspector under this Act or the regulations may appeal to the Board within 30 days after the making of the order. 1998, c 8, s. 57 (1).

The following are parties to the appeal:

- (1) The appellant,
- (2) In the case of any appeal by an employer, the employer's workers and each trade union representing any of the workers.
- (3) In the case of an appeal by a worker or trade union representing a worker, the worker's employer.
- (4) The inspector whose order is being appealed.
- (5) Such other persons as the Board may specify.

Safety and Consumer Statutes Administration Act, 1996
Ontario Regulation 3/05
Reviews and Appeals of Orders Issued by the Electrical Safety Authority

Director's review

2. (1) A person named in an order issued by the Authority under subsection 113 (5) of the *Electricity Act, 1998* who considers himself aggrieved by the order may, within 15 days of the issuance of the order, apply to the Director in writing for a review of the order. O. Reg. 3/05, s. 2 (1).

(2) If a person applies to the Authority in writing for an order under subsection 113 (5) of the *Electricity Act, 1998*, if the Authority does not issue the order within 15 days of the application and if the person considers himself aggrieved by the non-issuance of the order, the person may, within a further 15 days, apply to the Director in writing for a review of the Authority's failure to issue the order. O. Reg. 3/05, s. 2 (2).

(3) Before or after the expiration of the time for applying for a review under subsection (1) or (2), the person may apply to the Director for an extension in the time for applying for the review. O. Reg. 3/05, s. 2 (3).

(4) The extension shall be for no more than 15 days from the day that the Director grants the extension. O. Reg. 3/05, s. 2 (4).

(5) The Director may grant the extension if satisfied that there are apparent grounds for granting relief to the applicant and that there are reasonable grounds for granting the extension, and may give directions, as appropriate. O. Reg. 3/05, s. 2 (5).

(6) An application under subsection (1) for a review of an order of the Authority operates as a stay of the order pending the outcome of the review. O. Reg. 3/05, s. 2 (6).

(7) The Director may, without notice, order that the stay of the order be lifted if the Director is of the opinion that the action is necessary in the interest of public safety. O. Reg. 3/05, s. 2 (7).

(8) The Director is not required to hold a hearing when conducting a review under this section. O. Reg. 3/05, s. 2 (8).

(9) In reviewing an order of the Authority or the Authority's failure to issue an order, the Director may,

- (a) refuse to consider the substance of the application for a review and refer the matter to the Review Panel for a hearing under section 3; or
- (b) confirm, amend or rescind the Authority's order or make whatever other decision that the Director deems appropriate. O. Reg. 3/05, s. 2 (9).

Appeal to Review Panel

3. (1) A person named in a decision made by the Director under section 2 may appeal the decision to the Review Panel by filing a notice of appeal with the Review Panel within 15 days after the decision is made. O. Reg. 3/05, s. 3 (1).

(2) Before or after the expiration of the time for appealing a decision, a person mentioned in subsection (1) may apply to the Review Panel for an extension in the time for appealing the decision. O. Reg. 3/05, s. 3 (2).

(3) The extension shall be for no more than 15 days from the day that the Review Panel grants the extension. O. Reg. 3/05, s. 3 (3).

(4) The Review Panel may grant the extension if it is satisfied that there are reasonable grounds for applying for the extension and that there are apparent grounds for granting the extension, and may give directions, as appropriate. O. Reg. 3/05, s. 3 (4).

(5) An appeal under subsection (1) operates as a stay of the decision pending the outcome of the appeal. O. Reg. 3/05, s. 3 (5).

(6) Upon the application of the Director, which may be made without notice, the Review Panel may order that the stay of the decision be lifted if, in its opinion, the action is necessary in the interest of public safety. O. Reg. 3/05, s. 3 (6).

(7) Subject to subsection (9), if a person appeals under subsection (1) or if the Director refers a matter to the Review Panel under clause 2 (9) (a), the Review Panel shall appoint a time for a hearing and hold the hearing. O. Reg. 3/05, s. 3 (7).

(8) The Director or a person designated by the Director for the purpose is entitled to be heard at the hearing. O. Reg. 3/05, s. 3 (8).

(9) If, on the application of a party to a hearing before the Review Panel with notice to the other parties, the Review Panel is satisfied that the appeal is frivolous or vexatious, the Review Panel may refuse to grant the hearing or may terminate the hearing at any time and make an order of costs as it considers appropriate in the circumstances. O. Reg. 3/05, s. 3 (9).

(10) The Review Panel may, by order, confirm, amend or rescind the decision of the Director or make whatever other decision that the Review Panel deems appropriate. O. Reg. 3/05, s. 3 (10).

(11) The Review Panel may make orders as to costs payable by the parties to the appeal and orders requiring the parties to the appeal to reimburse the Authority for its expenses incurred in respect of the appeal. O. Reg. 3/05, s. 3 (11).

Rules for hearings

4. (1) The Authority may make rules establishing procedures for the hearing of reviews under section 2 and appeals under section 3 including,

- (a) rules applicable if a member of the Review Panel conducting a hearing is unable to continue to conduct the hearing because of illness or other reason; and
- (b) rules providing that the oral evidence given before the Review Panel at a hearing may be recorded if a party to the hearing so requests and pays the fee established by the Authority for that purpose in accordance with section 12 of the Act. O. Reg. 3/05, s. 4 (1).

(2) A rule made under clause (1) (a) may provide for the continuation or termination of the hearing, with or without the consent of the parties, or the commencement of a new hearing by a panel differently composed if the initial hearing is terminated. O. Reg. 3/05, s. 4 (2).

(3) A rule made under this section may be general or specific in its application and may apply differently to different hearings. O. Reg. 3/05, s. 4 (3).

Appeal to Divisional Court

5. (1) Any party to the hearing before the Review Panel under section 3 may appeal from the decision of the Review Panel to the Divisional Court in accordance with the rules of court on any question that is not a question of fact alone. O. Reg. 3/05, s. 5 (1).

(2) The Minister is entitled to be heard at a hearing under this section. O. Reg. 3/05, s. 5 (2).

(3) The judge who hears an appeal under this section may,

- (a) refer the matter back to the Review Panel for reconsideration by the Review Panel;
- (b) confirm or alter the decision of the Review Panel; or
- (c) make whatever other order that the judge sees fit, including an order that the Director or an inspector appointed under subsection 113 (6) of the *Electricity Act, 1998* do any act that the person is authorized to do under this Regulation or that Act. O. Reg. 3/05, s. 5 (3).

7-0 Public Education Best Practices

7-1: Know the Audience and Their Needs (Reformat 03/2006)

Practice Statement: In order to effectively educate about damage prevention and influence damage prevention habits, it is necessary to identify the target audience, establish what their training needs are, and create a communications package that is tailored to those training needs.

Practice Description:

The fundamental reason for conducting education and awareness campaigns is to try to convince someone, somewhere, to do something differently and change their behaviour.

The organizations and individuals who could benefit from Damage Prevention training are extensive and diverse. Therefore it is necessary to identify the target recipients of the training/awareness information. Steps that will prove useful in order to do so include:

- Examining where and by whom the majority of problems are
- Determining if there are historic trends in damage related information
- Categorizing incidents by:
 - a) *frequency* of occurrence
 - b) *severity* of occurrence
- Rank and prioritizing incidents to identify target audiences who need to receive education.

As part of developing the training information a set goal depicting the outcome of the training can be beneficial.

- Clearly lay out where and what the problems are - identify everything and anything that, directly or indirectly, has *not* been working satisfactorily.
- Establish what it would take to prevent further problems - ie - who needs to be doing what, when, where and why ... *differently?*
- Settle on the new behaviours that need to come into effect - ie - what would it take to change what is presently a problematic situation?
- Ensure that mutual benefits to a change in behaviour is identified and reinforced.

Promotional and educational materials should be effective as possible, and messages must be structured in an interesting, compelling and memorable way. In order to fully connect with the audience, some common methods of

- Event timing can be key. Some audiences prefer early morning sessions while others prefer other times of day.
- Education sessions held in conjunction with a complimentary meal event can bring a more social aspect to the event (e.g. breakfasts; barbeque luncheons)
- Guest speaker appearances help to capture the attention of property owners groups, business managers, civic clubs etc.
- Awareness videos are effective education tools.
- Packaged presentations for use at contractor and construction trade shows
- Varied mediums in training are effective; visual, hands-on and interactive methods can be combined.

7-2: Develop and Use a Marketing Plan (Reformat 03/2006)

Practice Statement: Develop a Marketing Plan that will take in to account the training needs of the participants, available resources, communications media and timeframes.

Practice Description: A marketing plan enables better implementation, control and continuity of advertising and promotional programs, and ensures the most effective and efficient use of limited resources. A comprehensive, strategic plan focuses on setting realistic goals and on allocating sufficient resources required to achieve those goals within specified timeframes. It also accommodates the need to track and analyze results.

7-3: Practice Good Project Management (Reformat 03/2006)

Practice Statement: Practice good project management when executing the marketing plan.

Practice Description: Good project management is essential to the success of the marketing plan. Establish a process/step-wise set of actions that clearly lays out:

- *who* needs to be involved
- *what* is to be achieved in terms of sub-tasks and the overall goal
- *when* the various tasks and assignments need to be completed
- *how* the awareness campaign or project should be done

Identify resource requirements (time, people, money) for each task and goal along the way, and how resources will be managed. Have a time-line, and stick with it. The need to track outcomes and trends for post-completion auditing is important for process improvements.

7-4: Create a Damage Prevention Message that “Sticks” (Reformat 03/2006)

Practice Statement: When promoting damage prevention, create a message that will “stick”.

Practice Description: Creating a message that is memorable can be done using creative material, such as visuals, props and sound clips; and delivering the message in a special venue or setting with an interesting presenter.

The message should incite action. The objective is to put new behaviours into practice quickly, easily, and over not only as soon as the audience leaves the venue, but tomorrow, the next day, and every day, week and month after that.

7-5: Promote the Damage Prevention Message (Reformat 03/2006)

Practice Statement: Promoting the damage prevention message by finding creative ways to persuade the target audience to a) listen attentively to the message, b) remember what they heard, and c) do something different because of it (i.e. - change their behaviours). Since some promotion activities can be expensive, partnering with other stakeholders can reduce costs.

Practice Description: Promoting the damage prevention message can be done through a variety of means and media. Targeted mailings involve pin-pointing a

specific message to a particular group or groups of recipients (e.g. - such as those in a specific geographic area, market sector, or demographic category).

Professionally designed advertising can be effective at securing the attention of a broader audience. Some examples include newspaper advertising, trade journal ads, brochures handed out at trade shows, event sponsorships, transit system signs, sponsorship of news and weather reports ("this segment brought to you by ..."), radio, television and internet educational messages.

Where possible take advantage of free media, such as public service announcements made by newspaper, radio or television. Existing websites are a low cost advertising channel to promote damage prevention.

Free items given to participants of a damage prevention session are an effective means of inciting audience participation and interest. Examples can include notepads, pens, luggage tags, mouse pads, clipboards, fridge magnets, and other frequently used items for home or office.

Current Practice:

- Direct mail bill inserts from utilities are frequently used to remind homeowners about the need to call before you dig if they plan to put in a deck, fence or tree.
- Industry newsletters and other periodicals can be targeted at specific trades, commercial partners, special interest groups etc.
- Rental equipment suppliers can supply point-of-purchase brochures, operating instructions etc. re-enforce the need to call for a locate.
- Manufacturers of do-it-yourself in-ground sprinkler systems provide informative posters in the aisles of their retail outlets that carry the same message.
- Utilities have a “call before you dig” message on their vehicles, which takes advantage of the circulation of the vehicles to institute free damage prevention advertising.

7-6: Establish Strategic Relationships (Reformat 03/2006)

Practice Statement: Establish and nurture strategic working relationships to assist in the promotion of damage prevention.

Practice Description: Strategic relationships can be nurtured with others who have shared or similar issues, interests, and needs. These could include industry associations, equipment manufacturers and trade groups. Other more distant stakeholders are also important, and these can include government agencies, emergency responders and media outlets.

7-7: Measure Results and Use Them to Improve (Reformat 03/2006)

Practice Statement: Critically review the results and outcomes of the various initiatives. An annual review is essentially a determination of successes and failures, followed by continuous program improvement to implement any lessons learned.

Practice Description: Determining what elements of the marketing plan worked and didn't work establishes the framework for future plans. Gauge audience response to structured training, familiarization and awareness initiatives. This can be done through surveying recipients (via direct mail, telephone etc.) to determine if

behaviours have changed, and to what extent. Quantifying the change in behaviour can be done by reviewing damage statistics and identifying if event/frequency/cost impacts have changed.

By identifying and addressing gaps in the damage prevention program, a practice of continuous improvement is established. Aspects that are effective can be enhanced and further utilized, and aspects that are less effective can be improved or abandoned. Additional training needs can be established.

8-0 Reporting and Evaluation Best Practices

8-1: Reporting Information

Practice Statement: All stakeholders have the opportunity to report information.

Practice Description: Facility owners/operators, locators, excavators, or those contracted by the owner /operator to repair plant, with an interest in underground damage prevention, can report qualified information on incidents that could have, or did lead to a damaged underground facility.

8-2: Standardized information

Practice Statement: Standardized information is reported.

Practice Description: The requested data is standardized and consists of essential information that can be analyzed to determine what events could, or did lead to a damaged facility. This means that collected data may include damage information, downtime and near-misses.

8-3: Non-compliant Stakeholder

Practice Statement: Identify the non-compliant stakeholder

Practice Description: It is important to identify the non-compliant stakeholder so that this group/sector can be targeted with education and training.

8-4: Accuracy of Information

Practice Statement: Person reporting provides detailed information.

Practice Description: If all of the requested data is not available, the person reporting the information provides the most complete information possible.

8-5: Changes in Reporting Format

Practice Statement: Requested information may change.

Practice Description: Requested information changes as additional or different data is deemed necessary for the evaluation process. The information required to be reported will be revised, as needed, to adapt to the changes in the regulation or statutes, the evolution of industry technology, and the awareness of root causes.

8-6: Simple Process for Collecting Data

Practice Statement: A simple, one page form for collecting data is adapted.

Practice Description: Data is to be collected using a simple, one page form that contains a list of the standardized questions that will be adopted or developed by facility owners/operators, locators, excavators, or those contracted by the

owner/operator to repair plant. By limiting the number of hand-written responses, the information is easy to complete. Check boxes or other simple answering techniques help the person in collecting the data and makes the evaluation process easier.

8-7: Training Process for Collecting Data

Practice Statement: Training is provided.

Practice Description: Training and education, on how to complete and submit the data, is made available.

8-8: Common Database in Place

Practice Statement: An organization is identified to receive the data.

Practice Description: A common database is maintained. The CGA's D.I.R.T. tool is the currently recommended organization/database utilized.

8-9: Data Evaluation Process

Practice Statement: An independent committee evaluates the data.

Practice Description: An independent committee, with representation from all interested stakeholders, is utilized to assist in the evaluation of the data.

8-10: Purpose of Data Collection

Practice Statement: Data is used to improve damage prevention efforts and to elevate underground damage awareness

Practice Description: The reported data is used to assess and improve underground damage prevention efforts. The reported data is not to be used to penalize or punish. Rather, it is used to elevate underground damage awareness through recommended training and education

8-11: Data Analysis

Practice Statement: Data is summarized by key components.

Practice Description: The reported data is summarized by key components

8-12: Root Cause

Practice Statement: Root causes are identified.

Practice Description: Root causes of damages or near damages are identified.

8-13: Quantifying Results

Practice Statement: Results are quantified against a standardized risk factor.

Practice Description: Results are quantified against a standardized risk factor. The risk factor considers a stakeholders exposure to potential damage. This risk factor may be based on factors such as the number of kilometers 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 period of time versus the total number of locate tickets issued.

8-14: Results Comparison

Practice Statement: Performance levels and trends are assessed.

Practice Description: Performance levels and trends are assessed against other organizations within the ORCGA or other similar CGA affiliated organizations.

Glossary of Terms and Definitions

The following Glossary is to be used in context with the Best Practices.

- ***Abandoned Line or Facility:*** Any underground or submerged line or facility no longer in use or not in use at the present time.
- ***Alternate Locate Agreement (ALA):*** A contractual agreement between a facility owner and an excavator that allows the excavator to proceed with their excavation work without receiving a traditional field locate.
- ***Attribute:*** Characteristic that helps describe the data.
- ***As-built or As-constructed Drawing:*** A detailed drawing representing the underground facilities as installed in the field showing an accurate relationship to some defined reference system in order that the location of the plant can be re-established at a later date.
- ***Backfill:*** The act of filling the void created by excavating or the material used to fill the void.
- ***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 acts and regulations.
- ***Damage:*** Any impact, stress and/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 appropriate authorities and the facility owner/operator of any damage made or discovered in the course of excavation or demolition work.
- ***Demarcation Point: (New 02/08)*** The demarcation point (DM) is the point at which the Facility Owner's ownership of a distribution system, including connection assets, ends. Privately owned infrastructure may continue from this point that is not owned by or known to the Facility owner.
- ***Demolition Work:*** The intentional 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 project or other activity that requires excavation or demolition work.
- **Electronic mapping data:** Geospatial data that is in a format that a 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.
- **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, 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 to gather, store or convey products or services.
- **Geospatial data:** Data that identifies the geographic location (latitude/longitude) and characteristics of natural or constructed features and boundaries on the earth. Also includes facility location information and notification areas.
- **Geographic Information System (GIS):** An organized collection of computer hardware, software, and geospatial data used to capture, store, update, maintain, analyze, and display all forms of geographically referenced information.
- **Grade (noun):** The surface elevation.
- **Grade (verb):** The act of changing the surface elevation.
- **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:** Electronic mapping 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.
- **Locate (verb):** The process of an underground plant owner/operator or their agent providing information to an

excavator which enables them to determine the location of a facility.

- **Locate (noun):** The provision of location information by an underground facility owner (or their agent) in the form of ground surface markings and/or facility location documentation, such as drawings, mapping, numeric descriptions or other written documentation.
- **Locate Form:** Accompanying documentation for a locate which is completed by the party providing the locate. A locate form may or may not contain the specific facility location details and/or drawings, but should in all cases contain administrative aspects of the locate such as when, when, why completed, and who completed it.
- **Locate Request:** A communication between an excavator and the plant owner or their agent in which a request for locating underground facilities is processed.
- **Locate Ticket:** A locate request document created by a one-call organization or a plant owner or their target agent marked with a unique identification number.
- **Longitude (Long):** Distance measured east or west from the prime meridian reference (Greenwich).
- **Notification Area:** The geographic limits of coverage where a facility owner/operator has facilities and wishes notification of excavation activities
- **One-Call Centre:** A system through which a person can with only one phone call, fax, or other communications, notify multiple facility owners/operators of proposed excavations.
- **Person:** Any individual or legal entity, public or private.
- **Practicable:** where possible in practice having due regard to limiting circumstances
- **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.
- **Survey Infrastructure: (New 02/2008)** Property boundary monuments and control survey monuments
- **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 facility is located, and in which special care is to be taken.

