UNDERGROUND INFRASTRUCTURE SAFETY IS A SHARED RESPONSIBILITY

BEST PRACTICES VERSION 3.0

DECEMBER 2013

British Columbia
BCCGA™
Common Ground Alliance

REGISTRATION CARD

Company or Organization _____

Role/Job_____

Industry Type:
___Contractor/Developer
___Occupant/Farmer
___Utility
___Government
___Other

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ACKNOWLEDGEMENTS

The British Columbia Common Ground Alliance wishes to extend its appreciation and gratitude to the people and organizations who have contributed to creating this book, Best Practices Version 3.0. The goal of this document is to provide British Columbia specific best practices for worker safety, damage prevention, and maintaining the integrity of underground infrastructure.

Special thanks to the Best Practices Committee members who contributed their time and knowledge to lead this process:

Committee Chair:
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- Trace Hobson, Badger Daylighting Inc.
- Brian Kidwell, EECOL Electric
- John Laxa, LineStar
- Will Meredith, GeoScan
- Keith Mitchell, Kiewit
- Brian Ramor, Think Green Landscaping
- Urvi Ramsoondar, BC Construction Safety Alliance

In addition to the committee, we acknowledge industry contributors and thank them for their input and feedback. Representatives include electrical, telephone, cable and gas utilities, municipalities, private contractors, construction companies, pipelines, locators, one-call centres, associations, and equipment suppliers.

We further thank the participating regulatory agencies such as WorkSafeBC, the British Columbia Safety Authority, the B.C. Oil and Gas Commission, the National Energy Board, and the BC Provincial Government.

TERMS AND CONDITIONS OF USE

The British Columbia Common Ground Alliance has created this book on best practices to serve as an educational guide and reference tool for prevention of damage to underground infrastructure. Given the size and diversity of the Best Practices, they have been broken down into the following topic specific modules:

1-0 Planning and Designing
2-0 One-Call Centre
3-0 Locating and Marking
4-0 Excavation
5-0 Mapping
6-0 Compliance
7-0 Public Education
8-0 Reporting and Evaluation

A number of stakeholders have volunteered their time and contributed to the development of these best practices through discussion, consensus, and collective judgment. These stakeholders from various industries brought different perspectives on relevant issues to help form the best practices.

In all fairness, the BCCGA must make these best practices subject to the following five limitations:

1. Although the BCCGA receives funding from several organizations, the BCCGA does not endorse any company, technology, technique, or product. No inference of endorsement shall be taken from any BCCGA Best Practice or from the BCCGA generally.

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5. The BCCGA best practices are a general guide. There may be particular settings and situations where industry or company practices, or where federal, provincial, or municipal laws and regulations may apply more appropriately.

INTRODUCTION

British Columbia has thousands of kilometres of pipelines, electrical and communication lines, water, sewer, and other underground facilities buried beneath its surface. Whether you are a ground disturber, contractor, facility owner/operator, or locator, everyone needs to be responsible for preventing the damage to these facilities. However, someone still needs to take the lead.

Established as a non-profit society in December 2005, the British Columbia Common Ground Alliance (BCCGA) promotes efficient and effective damage prevention for BC's vital underground infrastructure. Since January 2006, the BCCGA has been a regional partner of the Common Ground Alliance parent group based in Virginia, USA. BCCGA continues to grow, with more than 30 organizations participating as active members and sponsors that represent a wide cross section of stakeholders.

Over the years, these stakeholders have joined forces under the watchful eye of the BCCGA to actively promote the “Call or Click Before You Dig” campaign as well as other damage prevention practices. It is through the commitment and consensus of these members working together towards a safer province that the BCCGA has developed and published its third version of best practices for preventing damage to underground infrastructure in BC.

These best practices cover the type of activities that the BCCGA believes organizations will follow at an optimum level in order to prevent damage to BC's underground infrastructure. Although some stakeholders, but not all, are presently in a position to adopt these practices, the BCCGA anticipates that over time all stakeholders will make efforts toward following these practices. We must also remember these practices are not without their limitations. With more learning and advanced technology, these practices will evolve further.

The intent of the BCCGA is to make these best practices as easy to use as possible. However, we cannot do it alone. We welcome and appreciate your comments and suggestions on improving the content and format of this version. Industry stakeholders may also join in the Best Practices Committee meetings, and should know participation at this level is not restricted to BCCGA members.

To submit comments, join a Best Practices Committee meeting, or learn about the scope of the various Best Practices Committees, contact the BCCGA or visit www.commongroundbc.ca. For general information, please contact the following:

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1-0
PLANNING & DESIGNING
PRACTICE STATEMENTS AND DESCRIPTIONS

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1-0

PLANNING & DESIGNING

Planning and design are the first step in ground disturbance. Safe practices in planning and design can ensure safer practice throughout the project. Tools used in this stage include utility corridors, SUE, etc.

1-1 PLANNING UTILITY CORRIDORS

PRACTICE STATEMENT: Planners and designers should evaluate all applicable factors when determining the placement of underground utilities. Ideally speaking, existing utility corridors should be used to the fullest extent. In the case of entirely new installations, the planning and designing phase should take into consideration the creation of a common utility corridor for the current as well as the 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, planners and designers should assess the information developed in the context of the proposed installation to determine the safest, most efficient, and most effective configuration. With regards to entirely new installations in proposed corridors, it will be necessary to assess the information developed in the context of a common corridor configuration that accommodates all of the utilities involved. Planners and designers should also consider issues such as safety, setbacks, future operations and maintenance, preservation of boundaries, clearances, and future expansion.

Other options to consider for maximizing the effectiveness of the available area are to use specific planning practices, such as joint trenching and the development of Utilidors. Similarly, adopting standardized line locations could promote the safest, most efficient, and most effective installations.

The development of consistent provincial standards for the planning, design, and construction of common utility corridors also merits consideration. These standards 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 that 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 jurisdictions throughout North America. 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 has some of the following benefits:

- Accurate information regarding the location of underground utilities in a particular geographical area
- Safe, efficient, and effective installation, placement, operation, and maintenance of underground utilities
- Effective and efficient utilization of land
- Easier identification and location of underground utilities in future development projects, and
- Damage prevention to underground utilities

1-2 THE PROTECTION OF SURVEY INFRASTRUCTURE

PRACTICE STATEMENT: When designing the location for placement of a 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: Survey monuments are protected by both federal and provincial laws due to their significance.

The Criminal Code of Canada R.S. 1985, c. C-46 under Part XI, Sec. 442 and 443 states, “Everyone who wilfully 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.”

City of Winnipeg Survey Infrastructure Protection Program

The City of Winnipeg coined the phrase "Survey Infrastructure," which placed the survey fabric on par with the other municipal infrastructures (i.e., sewer and water, hydro and gas, etc.). It is critical to recognize that survey infrastructures are just as important and require the same amount of protection.

The BC Land Survey Act [RSBC 1996] Chapter 247 governs the parameters that should be taken into consideration when planning a development.

1-3 INCLUSION OF UTILITY INFRASTRUCTURE ON DEVELOPMENT PLANS

PRACTICE STATEMENT: Development plans that involve the development of real property should include the designation of existing and both proposed above and underground utility infrastructures. A development plan, for the purpose of this section, relates to official plans, re-zonings, draft plans of subdivisions and condominiums, and site plans.

PRACTICE DESCRIPTION: A development plan requires having certain information before it can be filed with the appropriate municipality prior to the development of land. The plan should include the locations of both the above and underground facilities that cross over the land described in the plan. This practice is to help notify developers and the public about the existence of infrastructure facilities. It would also alert facility owners/ operators of the need to communicate with the developers in order to facilitate planning for the lands that complements the utility infrastructure.

Facility and utility owners should maintain accurate and timely records of their abandoned and out-of-service plants. The development plans need to identify any of these types of plants that are no longer in use, along with the existing, future, and proposed facilities.

CURRENT PRACTICE: Submission requirements for site plan approvals should include the following existing and proposed utility information:

- The site plan should outline existing and proposed sanitary and storm water drains, catch basins, Siamese connections and curbing, hydrants, utility poles, pole anchors, and light standards, and
- The draft plan of the subdivision should cover municipal services that are available or will be available to the land that is proposed to be subdivided

BENEFITS: The requirement to have utility infrastructure locations identified on draft and site plans should ensure facility owners/operators become fully aware well in advance of the development and excavation activity that will impact on their facilities. This requirement should also facilitate the optimal use of the land being developed, and maintain the integrity of the utility infrastructure.

1-4 GATHERING INFORMATION FOR DESIGN PURPOSES

PRACTICE STATEMENT: The designer or engineer should use all available and reasonable resources for acquiring information about utility facilities in the area to be developed.

PRACTICE DESCRIPTION: The designer or engineer needs to gather all available information from the facility owners/operators during the planning or preliminary design phase of a project. Such information that would be necessary includes 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.

A means of gathering information is to contact the one-call centre, facility owners/operators, property owners, public utility commissions (PUCs), and government (municipal, provincial, and federal) departments and agencies. Another means would be to review the site for above ground evidence of underground utilities. Items such as permanent signs or markers, manhole covers, vent pipes, power and communication pedestals, and valve covers can all indicate evidence of an underground utility. If using the latter method, the designer should be purposeful in gathering the required information. The designer should use the information for the purposes of route selection and preliminary neighbourhood impacts, and for the evaluation of different design possibilities.

During the detailed design phase of a project, it is necessary to have precise information on the locations of utility facilities in the area. This knowledge ensures accuracy and minimizes the possibility of utility conflicts. A survey of utility infrastructure and documenting the methods used can help to obtain the required information.

CURRENT PRACTICE: To perform a survey of utility infrastructure requires following some of the basic practices. The results will be more effective if performing these steps in sequence. However, it may not be necessary to complete all the 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 location of existing and proposed underground facilities in the entire construction project area
2) Attend the job site to correlate the information already gathered about existing utilities 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 determine the exact locations of existing underground facilities (In this step, 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 non-destructive means, e.g., hydroexcavation.)

BENEFITS: Gathering underground facility information and incorporating it into the planning and design phase can be beneficial. It minimizes the hazards, cost, and work to produce the final project. Other benefits include the enhancement of safety, elimination of unexpected facility conflicts, and minimizing of facility relocations.

REFERENCE: The American Society of Civil Engineers has the standard guidelines for the gathering and depicting of existing subsurface utility data.

1-5 SUBSURFACE UTILITY ENGINEERING (SUE)

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, a brief summary of the Quality Levels are defined therein:

The four Quality Levels are as follows:

Quality Level D – Existing Utility Records: Information gathered solely from existing utility records can provide an overall sense of how much congestion there is around the utilities. The information, however, may be limited in terms of accuracy and comprehensiveness. Information at this level should be limited to project planning and route selection activities.

Quality Level C – Surveying Above Ground Facilities: Information gathered from the surveying of above ground facilities, such as manholes, valve boxes, pedestals, and so forth, is to enhance the information obtained at Quality Level D.

Quality Level B – Surface Geophysical Techniques: This method involves the use of surface geophysical techniques or "designating" (for example, electromagnetic measurements, ground penetrating radar, induced polarization, magnetometer, seismic surveys or shallow direct-current electrical resistivity sounding) to determine the existence and horizontal position of facilities, including those facilities found using the Quality Level C step. The two-dimensional mapping information obtained is often sufficient for excavation planning. The data can facilitate decisions regarding the placement of new structures or facilities to avoid conflicts with existing facilities.

Quality Level A – Non-destructive Excavation: The use of non-destructive excavation devices or "locating" at critical locations can determine the precise horizontal and vertical positions of existing facilities. This method can also determine the type, size, condition, material, and other characteristics of the facilities. A precise plan and profile information on the facilities can assist in making final design decisions. As well, a Subsurface Utility Engineer can guarantee the accuracy of the information gathered at this level.

1-6 IDENTIFYING EXISTING FACILITIES IN PLANNING AND DESIGN

PRACTICE STATEMENT: Designers should indicate existing utility facilities on drawings during the planning and design phases.

PRACTICE DESCRIPTION: During the planning and preliminary design phase of a project, the designer should indicate all existing facilities on the plans. These facilities could include hydro/power, gas, telecommunications, CATV, water mains, sewers, and so on. The plans should also include possible routes for the project in a manner corresponding to the known underground facility information. In addition, facility owners/operators should have the opportunity to provide relevant comments.

During the detailed design phase of the project, the project owner indicates on the plans the utility facility information, which are to include all known active, abandoned, out-of-service, future use, and proposed facilities. The project owner should also note on the plans the method used to gather the information. This allows both the designer and the contractor to know the quality level of the information. Additionally, the plans should include a summary showing the proposed facility route or excavation. Again, all affected facility owners/operators should have the opportunity to provide final comments and clarifications on the plans.

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

DESIGN PROCESS (1-7 TO 1-10)

1-7 UTILITY COORDINATION

PRACTICE STATEMENT: Project owners and facility owners/operators should communicate and coordinate with each other on a regular basis concerning current and future projects. As well, utility coordinating committees should be established and mandated to deal with specific projects and issues of concern.

PRACTICE DESCRIPTION: Project owners should circulate design drawings to facility owners/operators to allow them to identify the locations of their infrastructures and point out any potential conflicts. These drawings should have sufficient information of the proposed work to let facility owners understand the scope of the work and the impact the work will have on their

infrastructures. If the facilities require relocation, it will be critical to develop a realistic schedule that will allow time for the design, construction, and budget approvals for relocating the facilities.

Utility coordinating committees have the resources to develop solutions for problems associated with managing public and private infrastructure projects within the public road allowance. Problems can arise because of poor communication and coordination between the key parties involved in the design and construction of the projects. A lack of communication and coordination often leads to increases in project costs, project construction delays, and difficult working relationships because of the need to relocate existing infrastructure.

The frequency of these problems and their potential impact on project budgets can increase under the following conditions: density of the infrastructure; demand for occupancy and space within the road allowance; and poor quality as-built records of existing public and private infrastructure. A utility coordinating committee can lessen the frequency and financial impact of these problems through better communication processes, improved coordination of planned capital and operation works, and enhanced working relationships.

A successful utility coordinating committee possesses these key factors:

- Committee is founded and guided by the spirit of cooperation
- Committee operates under a Terms of Reference or Charter approved by the committee members
- Member organizations are committed to the responsibilities of the committee, and
- Designated representatives of each member organization have the necessary leadership, planning ability, and implementation skills

CURRENT PRACTICE: Some utilities in BC have initiated a process for the sharing of information known as a "single source management system." This system 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 mark-ups, cost efficiencies, and improved communication among those utilities.

BENEFITS: This practice promotes regular communication between utility owners and operators, municipalities, consulting engineers, and contractors.

It also improves the level of information regarding current and future projects, and helps to identify and resolve issues of mutual concern.

1-7-1 COMMUNICATIONS PROTOCOL – JOINT UTILITY COORDINATION

As communications among project owners and facility owners/operators are critical, the protocol should reflect the following characteristics:

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.

1-7-2 STAGES

Project owners and facility owners/operators need to communicate during these critical stages:

Long Range Planning – Development and approval of the strategic long-term capital plan.

Multi-year Program – Finalize and approval of the multi-year plan. Time frames for these plans may vary according to the project owner's overall planning framework.

Project Design Initiation – All parties define the scope of the project, including the start time for construction.

Detailed Design – Defining the exact details of the project and having the construction documents ready for tender.

Current Year Program – Approval and financing of the current year program for program construction.

Construction – Responding to any circumstances and situations during the construction period, e.g. where design alternations need to be made.

1-7-3 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.

1-8 UNDERGROUND FACILITIES SHOULD BE LOCATABLE

PRACTICE STATEMENT: The presence and type of underground facilities should be readily locatable. Using devices such as tone-able pipes, cables, tracer wires, locator balls, as well as permanent above and below ground markers, should easily identify the facilities.

PRACTICE DESCRIPTION: No underground facilities should be installed that cannot be readily found at a later date. Geophysical methods and permanent locator ball systems are just some of the existing means for locating utilities. Additionally, using above and below ground markers in combination of one another can help to identify and locate underground facilities.

Above ground markers can identify facilities but are not to circumvent the need to locate facilities prior to excavation. These markers should be developed during the design phase of a project and should include the company's name, type of facility, and emergency contact numbers. The construction plans should

specify the location and type of markers by using American Public Works Association colour standards.

PRACTICE EXAMPLES: During the planning phase, the designer needs to obtain a list of affected facilities. He or she should then contact the facility owners for the design and encroachment information. The facility owners/operators must specify in the design the marker locations for each encroachment during and after construction.

In the installation of additional underground facilities, the designer should obtain a list of affected facilities. A detailed marker system should be used to effectively mark the various facilities. Two types of detailed marker systems include tracer wire for non-metallic facilities and electronic or surface markers for facilities at excessive depths.

BENEFITS: One benefit is that the design has provisions to help in future locates. In addition, an effective marker system will assist facility owners/operators as well as first responders in situations where there is an incident near an underground facility or where there is more than one underground facility.

1-9 COMPLY WITH APPLICABLE CODES, REGULATIONS, AND STANDARDS

PRACTICE STATEMENT: The designer, when planning and designing the installation of new or replacement facilities, should comply with the following:

- Federal and provincial statutes, regulations, codes, standards, and guidelines
- Municipal by-laws
- Owner and operator standards, and
- British Columbia Common Ground Alliance best practices

PRACTICE DESCRIPTION: The designer of a facility project considers standards and practices and complies with the codes and regulations that apply to that particular facility and all adjacent facilities. Regulations, codes, standards, and other design documents generally specify depth of cover and horizontal and vertical clearances between adjacent facilities. To ensure compliance, the designer circulates the design to any of the appropriate stakeholders within the *Right of Way*. The stakeholders review the design according to the level of detail that accompanies it.

The designer has to consider the protection and temporary support of adjacent facilities. He or she also needs to consider any interference with existing cathodic protection and grounding systems. The designer specifies on which safety measures to take, the procedures for emergency notification, and the necessary repairs in the case of any damage to an adjacent facility. As well, it is essential that designers and facility owners make all parties aware of new and revised codes and standards that may affect the project.

APPLICABLE CODES AND STANDARDS

- National Energy Board Pipeline Crossing Regulations, Parts I and II
- Canadian Standards Association CSA – Z662: Oil and Gas Pipeline Systems
- Canadian Radio-television and Telecommunications Commission
- Canadian Electrical Code
- WorkSafeBC
- BC Oil & Gas Commission, and
- British Columbia Safety Authority

BENEFITS: The designer minimizes potential conflicts and damages as well as facilitate future locates when reviewing applicable regulations, codes, and standards.

1-10 CONSTRUCTABILITY REVIEW

PRACTICE STATEMENT: The facility project should be subject to a constructability review.

PRACTICE DESCRIPTION: Although constructability reviews occur throughout the design stage and prior to the finalization of the design, they should also occur during the project. The constructor, project designer and engineer, and the project owner all participate in this review. Other participants may include the facility owners/operators affected by the project. Participants can assess the constructability of the project design, evaluate project alternatives, review proposed schedules, and facilitate a more smoother, economical, efficient, and safer construction. This process results in a final design that is circulated appropriately for approvals.

PRACTICE EXAMPLE: The project design phase should have advanced to the point that a constructor has sufficient information to make educated comments

on the most efficient and cost effective approach to completing the project. The constructor also takes into account the scope of work, public and community relations, operational restrictions peculiar to the site, potential detours, and staging requirements. These factors may support and demonstrate the advantages of full road closures as opposed to staged construction that allows full public access to the site.

BENEFITS: Performing a constructability review will result in a more efficient construction, a more effective design, reduced costs, and improved safety.

PRE-BID AND BID (1-11 TO 1-13)

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 among qualified, competent, and experienced contractors should assure both quality and price, and should minimize the risk of damage to underground facilities.

PRACTICE EXAMPLE: Most large organizations involved in capital works have developed policies to qualify contractors. Often these policies entail establishing criteria in such areas as financing, insurance, occupational health and safety, and performance that must be met before participating in a bidding process.

BENEFITS: To allow qualified, competent, and experience contractors to compete in the bidding process may assure both quality and price, and minimize the risk of damages to underground facilities.

1-12 PRE-BID CONFERENCES

PRACTICE STATEMENT: Depending on the size and scope of a project, a pre-bid conference that involves all stakeholders should be held. Bids should be accepted from only those qualified contractors that attend the conference.

PRACTICE DESCRIPTION: There should be a pre-bid conference that involves the facility owners/operators who have facilities that the project design and proposed excavation will affect. As well, the project owner should require that all potential qualified contractors attend the conference. The conference needs to address, at the very least, the requirements of the project with regards to the protection, support, and safe maintenance of the facilities during the excavation and construction phases. The minutes of the conference should be recorded and circulated to all those that were in attendance.

PRACTICE EXAMPLE: A pre-bid conference usually involves the project owner, project design staff, facility owner and operator, and potential contractors. During the conference, contractors will become aware of the special requirements of the project. These would include certification, safety, and the regulatory environment.

BENEFITS: A notable benefit of a pre-bid conference is the opportunity for the owner, contractor, designer, and other interested parties to discuss the many aspects and issues of the proposed project. Such aspects could include:

- Clarification of scope
- Review of contract documents
- Regulatory requirements
- Schedules, and
- Damage prevention

A pre-bid conference ensures that all potential participants in the project will have the same understanding of the project requirements and complexities.

1-13 CONTACT DURING THE PRE-BID AND BID PHASES

PRACTICE STATEMENT: Once a project design is completed, the designer, engineer, or design engineer should be available to answer questions and clarify aspects during the pre-bid and bid processes.

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.

PRACTICE EXAMPLE: Contract documents should contain information that clarifies the purpose of the design and may also include background information in support of the design, geotechnical reports, hazard assessments, site specific considerations, project approval requirements, etc.

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.

CONSTRUCTION AND POST-CONSTRUCTION

1-14 CONTACT DURING CONSTRUCTION

PRACTICE STATEMENT: The designer, engineer and/or design engineer should be available during the entire construction for consultation with the contractor.

PRACTICE DESCRIPTION: During construction, the designer and contractor need to maintain contact. Design support should be 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 the 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.

BENEFITS: Potential problems are resolved more quickly, which minimizes the need to modify the project design, costs, and completion. This practice also facilitates the designer's progress inspections of the project.

1-15 AS-BUILT DRAWINGS AND AS-CONSTRUCTED DRAWINGS

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, and UCCs) and those parties should update their records accordingly. In this way, utility records should be maintained as current as possible.

PRACTICE DESCRIPTION: As-built and as-constructed drawings should be valid. The information on as-built and as-constructed drawings are to help with future locates and construction. All appropriate parties involved (i.e. municipalities, utilities, public works authorities, utility coordinating committees, and so on) should receive any information updates on the project and they should update their records accordingly. This practice is a way of keeping utility records as current as possible.

Installations should be in accordance with the approved construction plans. It is essential to approve, document, and record on the as-built and as-constructed drawings any deviations to these plans. It is also important to retain the drawings and make them available for future projects.

As-built and as-constructed drawings should have the following features:

- Any deviations in construction from the approved design
- Level of accuracy in the horizontal and vertical locations of the underground utility
- Methodology used to measure the accuracy (e.g., geodetic survey)) or relationship to topographical/physical features at the time of construction
- Date the drawings were prepared, and
- Method of construction (e.g., directional drilling)

CURRENT PRACTICE: All as-built and as-constructed measurements should be ready to be submitted. These measurements should be available upon completion of construction and prior to the final acceptance of the installation by the owner.

The measurements should note any deviations in the following areas:

- Horizontal and vertical alignment from the established baseline
- Location of valves
- Access chambers
- Manholes
- Service boxes, and
- Stub connections for services

The measurements should also note any of these applicable structural details:

- Final invert elevations
- Pipe sizes
- Grade changes
- Manholes, and
- Chambers

It will be necessary to note any information that may affect the future maintenance of any of the utilities noted in the drawings. All drawings should note these changes “As Recorded” with the date marked in a prominent location.

1-16 SEWER/WATER MAIN SERVICE CONNECTIONS

PRACTICE STATEMENT: Sewer laterals, water main service connections and other utility services should be installed and locatable from the sewer/water main to 1.5 metres beyond the property line in new subdivisions.

PRACTICE DESCRIPTION: For the purpose of health and safety, damage prevention, and construction efficiency, the sewer laterals and water service connections installed in new subdivisions should be extended from the sewer/water main to 1.5 metres beyond the property line and plugged with a water tight plug. This practice allows workers who are installing the connections from the stubs to the homes to establish a safe stable work environment and also minimize impact to the existing facility infrastructure. Caution, municipalities may have different standards and practices so verification with the municipality's requirements is necessary to ensure compliance.

1-17 SHARING OF SEWER MAIN AND LATERAL INFORMATION

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 from the municipality/developer all sewer main and lateral information including foundation drain collectors (FDC) pertaining to that project area. 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: 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 bore or lateral service has not been damaged.

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.

1-18 DEMOLITION PERMIT APPLICATION PROCESS

PRACTICE STATEMENT: The Municipality shall have a process requesting that the demolition permit applicant receives confirmation of all utility disconnects prior to issuing the demolition permit.

PRACTICE DESCRIPTION: The Municipality shall request that the applicant makes arrangements with the appropriate utilities for the termination and capping of all the water, sewer, gas, electric, telephone, cable or other facilities/services. Furthermore, the Municipality should indicate on the demolition permit that locates should be obtained from utilities prior to the demolition beginning.

2-0
ONE CALL CENTRE
PRACTICE STATEMENTS AND DESCRIPTIONS

British Columbia
BCCGA
Common Ground Alliance

2-0

ONE-CALL CENTRE

2-1 PUBLIC AWARENESS AND EDUCATION

PRACTICE STATEMENT: The one-call centre has a documented program in place for pro-active public awareness, education, and damage prevention activities.

PRACTICE DESCRIPTION: The one-call centre meets the following objectives:

- Encourage and promote the “Call Before You Dig” practice
- Raise awareness for the responsibility of safeguarding the public and workers
- Enhance awareness for protecting the integrity of buried infrastructure
- Foster a cooperative approach between the digging community and the owners of buried facilities toward damage prevention of buried facilities,and
- Promote the services the one-call centre provides

The one-call centre participates in any of these activities:

- Create promotional items and media advertising
- Attend safety meetings, seminars, and trade shows
- Develop contractor awareness programs
- Distribute one-call system education materials
- Maintain a database of active members of the local digging community
- Mediate relations and expectations of both the digging community and facility owners/operators, and
- Coordinate and participate in damage prevention and facility location committees

REFERENCES: One-call Common Ground Alliance best practices, currently distributed pamphlets, utility billing inserts, and recall items. Website with established links from member sites, participation in contractor events, trade shows, symposiums, and so on. Invite stakeholders to view the centre's operations.

2-2 DEFINED GEOPOLITICAL SERVICE AREA WITH NO OVERLAP

PRACTICE STATEMENT: The one-call centre is to serve British Columbia in its entirety. A ground disturber should need to only make one call for its members. As well, a facility owner or operator should need to only belong to a single one-call centre.

PRACTICE DESCRIPTION: The intent of the one-call centre program is to make it easier for ground disturbers and facility owners or operators to call in. Each specifically defined geopolitical service area has a single designated one-call centre and this centre should not coincide nor overlap with another area.

The one-call centre has two requirements in order to meet and implement this best practice:

- It should allow a ground disturber to use a single point of contact with which to submit and follow up on a notice of intent to excavate and notify affected facility owners or operators, and
- The program should also permit a facility owner or 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 responsibilities of the one-call centre and its members.

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 the 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 stakeholder representatives. Stakeholders come from a variety of industries, such as facility owners/operators, contractors, designers, project owners, and government representatives. Each stakeholder representative is knowledgeable in his or her 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: The one-call centre has only one toll free telephone number and one toll free fax number with which to receive locate requests. A caller can telephone or fax the centre free of charge from anywhere in North America. The one-call centre also maintains an email address as an alternate means of receiving locate requests.

2-6 HOURS OF OPERATION

PRACTICE STATEMENT: The one-call centre is available to process locate requests 24 hours a day, 7 days a week.

PRACTICE DESCRIPTION: The one-call centre has in place a process where a caller who has a locate request can contact the one-call centre, at anytime of the day or night, on any day of the year, and have that request processed.

2-7 VOICE RECORD OF ALL INCOMING CALLS

PRACTICE STATEMENT: The one-call centre maintains a voice recording of each voice transaction 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: The one-call centre retains voice recordings of all telephone calls regarding requests to locate facilities for a period of three years or as according to applicable statutes.

PRACTICE DESCRIPTION: A voice recording is a factual record of the communications that occurred between a caller and the one-call centre. The one-call centre must maintain these records and make them accessible until expiry as per the applicable statute of limitations in British Columbia. As these laws may change, there is not a specific time period set forth as a best practice. Unless there is notice by a party to the contrary, these records may be destroyed after the statute of limitations has expired. Until then, 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 or operators who are to receive notification for each locate request.

PRACTICE DESCRIPTION: This practice enhances the efficiency of the one-call process if the one-call centre is able to provide the locate request number and the names of the facility owners/operators that will be notified. When a ground disturber is given this information, he or she knows which owner or operator in the area of the planned excavation will be notified. This helps the ground disturber to determine if the facility owners or 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 that is determined by applicable statutes.

PRACTICE DESCRIPTION: In the case of a damage investigation, litigation, or other event, a copy of the location request ticket is often necessary. The one-call centre has the ability to produce a hard copy printout of the ticket, as necessary, for the appropriate statutory period.

2-11 DOCUMENTED OPERATING PROCEDURES, POLICIES, AND MANUALS

PRACTICE STATEMENT: The one-call centre has in place documented operating procedures, human resources policies, which include health and safety, and training manuals.

PRACTICE DESCRIPTION: Each one-call centre has documented policies, procedures, practices, and training manuals on its site. These documents will be dated, kept in a designated place or area, and available for reference.

2-12 DOCUMENTED OWNER VERIFICATION OF DATA

PRACTICE STATEMENT: The one-call centre returns the geographic description database documentation to the facility owners/operators. This process is to have them verify and approve that the information submitted is current and accurate. This practice occurs annually and after every change.

PRACTICE DESCRIPTION: It is important that all information on the existence of buried facilities is current and correct. This practice allows the one-call centre to produce accurate records as evidence. However, the one-call centre can only work with the data the facility owners/operators provide to them.

Whenever there is an addition or deletion made to the information by the facility owner or operator, it is entered into the database. The one-call centre sends the database documentation back as part of the formal agreement between the centre and the owner or operator. The intended owner or operator then verifies and approves that the information is current and accurate. This process occurs every year and after each change.

2-13 FLEXIBILITY FOR GROWTH AND CHANGE

PRACTICE STATEMENT: The one-call centre has an operating plan that is sufficiently flexible to accommodate growth and change.

PRACTICE DESCRIPTION: A successful one-call centre is flexible in its response to change by forming and maintaining a responsive governance. This governing body includes a Board of Directors and stakeholders that adequately represent the needs of all stakeholders.

The governing body drafts bylaws and operating procedures that reflect the current environment in which the one-call centre serves. These documents are reviewed on an ongoing basis to ensure they align with growth in the one-call industry. The governing body also conducts regular strategic planning sessions during which it reviews the current state of the one-call centre's major systems, programs, and outreach activities. These assessments help to identify stakeholder needs for future growth and development.

The Board members, stakeholder group representatives, and centre management teams stay current with the one-call industry by joining associations and attending conferences or other educational events. This participation helps them to better identify new opportunities for growth and change.

2-14 GROUND DISTURBER/OPERATOR MEETINGS INITIATED BY ONE-CALL

PRACTICE STATEMENT: The one-call centre has a process in place for receiving and transmitting meeting requests between the ground disturber and the facility owner(s) or operator(s). This process is for the purpose of discussing the location of facilities on large or complex jobs.

PRACTICE DESCRIPTION: The one-call centre has a process in place for relaying a ground disturber's request for an on-site meeting with a facility owner or operator. If a meeting is necessary to outline the limits and schedule of the work, the one-call centre indicates a request for a meeting. The ground disturber is to provide sufficient information that clearly identifies the boundaries of the proposed work site. A meeting request, however, does not necessarily eliminate or replace the need for a locate request.

2-15 ONE-CALL CENTRE ACCEPTS NOTIFICATION FROM DESIGNERS

PRACTICE STATEMENT: The one-call centre accepts design requests and is able to process them as designated by the facility owner or operator.

PRACTICE DESCRIPTION: Project designers have a need to access facility location information from facility owners/operators. This access is to facilitate damage prevention to buried facilities. Upon receiving the design request, the one-call centre provides a listing of facility owner(s) or operator(s) to the

designer directly. The one-call centre then processes the request to each facility owner or operator identified on the list.

2-16 LOCATE REQUEST

PRACTICE STATEMENT: The one-call centre takes no less than the following required information on a locate request:

- Caller's name and contact number
- Ground disturber's name (and company's name), address, and contact number(s)
- Specific location of the proposed excavation
- Start date and time of the proposed excavation, and
- Description of the excavation activity

PRACTICE DESCRIPTION: A locate request is a communication between a ground disturber and the one-call centre for locating underground facilities. The one-call centre needs at least a minimum amount of information in order to process this request. Any additional information on the locate request that is available will help to establish the specific location of the excavation site. Such additional information may include:

1. More detailed information on the specific location of the excavation:
    - Municipality or community
    - County, region, district, or township
    - Province
    - Street address
    - Street name
    - Postal code
    - Length and direction of the excavation and the nearest adjacent streets
    - Subdivision and lot number
    - Latitude and longitude coordinates[1]
    - Highway markers
    - Railroad and pipeline markers
    - General instructions and directions
    - Distance to nearest cross street
    - Contact number at dig site
    - Lot and concession
    - Map reference
    - Pole numbers
    - Any other related references

2. Intended start date and time of excavation
3. Excavating by hand or machine
4. Type of excavation activity (boring, blasting, trenching, and so on)
5. For whom the excavation is being done
6. Purpose of the excavation (i.e., what will be installed or built?)
7. Excavation on public property
8. Excavation on private property and where (front, rear, or side)
9. Is the pre-dig site marked by the ground disturber?
10. Depth of the excavation
11. Is a site meeting requested?
12. Any additional remarks

[1] Latitude and longitude coordinates or specific address of the dig site may be done automatically by the GIS subsystem or determined by a computer assisted customer 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.

2-17 PRACTICES TO REDUCE OVER-NOTIFICATION

PRACTICE STATEMENT: The one-call centre uses practices that reduce the number of transmitted notices to facility owners or operators to only that of the desired area of notification of reported excavation sites.

PRACTICE DESCRIPTION: The one-call centre has the technology that allows the facility owner or operator to determine its desired area of notification with the use of polygons. To reduce over-notifications, this technology should:

- Enable the one-call centre to define the proposed excavation site buffer to within approximately 250 metres (800 feet), wherever due diligence and mapping accuracy allows, and
- Provide the facility owner or 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, which enables the one-call centre's operations to continue in the event of a disaster.

PRACTICE DESCRIPTION: The one-call centre develops, implements, and maintains an effective disaster recovery plan. This plan enables the centre to continue its operations in the aftermath of a disaster that has affected the facilities. This plan also includes continued communications with local emergency services in order to provide safe access to the centre.

Under the disaster recovery plan, ground disturbers and underground facility owners/operators outside of the disaster affected areas can continue to conduct their operations with minimum to no delays in the services provided by the centre. The plan also makes provisions for the centre to process emergency locate requests for the areas affected by the disaster.

The one-call centre (primary centre) has an arrangement with another remote location (secondary centre), which is to serve as a back up to the primary centre. This arrangement covers the following items:

- **Telecommunications** — alternate routing schedules are in place and ready to be activated within minutes of the primary centre's failure
- **Hardware and software** — the secondary centre has compatible hardware to that of the primary centre and always has a copy of the primary centre's current software
- **Database** — the secondary centre receives the primary centre's database, including locate requests on a regular basis, preferably in real time
- **Staffing** — a portion of the secondary centre's staff is cross-trained for the primary centre's operations at all times, and
- **Simulated emergency testing** — at least once a year and on a random basis, the disaster recovery plan is implemented to make sure it is operational

2-19 REMOTE USER INTERFACE

PRACTICE STATEMENT: The one-call centre provides users with a means of direct electronic entry of locate requests of comparable ticket quality. Users are able to assist by entering their own information.

PRACTICE DESCRIPTION: The one-call centre has interactive data communications that allows qualified members and ground disturbers to enter data remotely. The remote user interface validates the information and allows the user to make corrections wherever necessary. The user is able to do this by referencing the same geographic database used at the one-call centre for receiving a voiced-in request. The intent of this process is to ensure and maintain ticket quality 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 as well as its 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, a valid address or 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 benefits are as follows:

- 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 ground disturber receives timely markings covering the area of excavation

In contrast, standardizing on a limited set of criteria reduces the flexibility of the system to serve the ground disturber and facility owner/operator. To avoid this barrier, the one-call centre invests in systems and processes that can incorporate 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. This practice assists in reducing over-notification.

2-21 SECURITY

PRACTICE STATEMENT: The appropriate physical and systems security, fire protection, and electrical protection are in place to protect the one-call centre and its critical components.

PRACTICE DESCRIPTION: The one-call centre is a critical link in the communications chain between the digging community and facilities. It needs to do whatever it can to provide adequate security to protect the centre since it may well need to be operational when faced with natural disasters or other threats. Security components may include:

- Physical security for the building and employees; through locked operations areas, lighting, employee key cards, and guard patrols
- Physical security for critical systems components, which may include locating the facilities well behind locked rooms or offices, and restricting access to only necessary personnel
- General fire protection for property and personnel
- Specialized fire and theft protection for critical systems components
- Telephone demarcation points in a protected area within the centre
- Passwords and protections to limit access to computers and other systems, and
- Offsite storage of duplicate database 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 interruption or degradation of services. Such a system can detect the malfunctioning component and initiate its replacement while remaining online and processing its normal operations. In the event of a failure or malfunction, this system maximizes the probability that the one-call centre can continue to properly process a locate request.

2-23 QUALITY STANDARDS

PRACTICE STATEMENT: The one-call centre has performance standards for the operation of the centre. This practice is for the purpose of promoting accuracy, cost effectiveness, and efficiency.

PRACTICE DESCRIPTION:

A. Customer Quality of Service Performance Measurements – It is a best

practice in the one-call centre industry to monitor the quality of service provided to the customer that calls the centre. Key measurements include:

1. Speed of Answer
   Process – Most call centres route incoming calls through an automatic call distributor (ACD) either via an on-the-premise private branch exchange (PBX) or a central exchange (Centrex) at the telephone company's central office. Both these devices provide reports that identify, on average, how long callers 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 entire day.

   Service Level – An objective service level should be set based upon customer satisfaction and economics. An ASA objective of 30 seconds or less is recommended.

2. Abandoned Calls
   Process – The PBX or Centrex also provides the data on abandoned calls. It will normally identify the number of calls abandoned and how long the callers waited before ending the call.

   Service Level – An objective service level should be set based upon percentage of calls. An abandonment rate of less than 5 percent 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 percent of the total incoming call volume.

4. Customer Satisfaction
   Process - A fundamental principal in measuring quality is that “the customer defines quality.” Customer satisfaction surveys of callers are conducted periodically.

   Service Level – An objective service level is set based upon the percentage of callers' responses. An objective of 99 percent 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 confirm 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 audits reports are sent to receiving locations daily.
    1. Average emergency ticket transmission time should be less than 5 minutes.

    2. Average priority notice ticket transmission time should be less than 15 minutes.

    3. Average standard ticket transmission time should be less than 30 minutes.

    4. The ticket information should be transmitted in an electronic data format that allows the receiving equipment to parse or 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 MAPPING

PRACTICE STATEMENT: The one-call centre maintains a database of current street centreline mapping, and updates it as new or revised mapping data becomes available to the centre.

PRACTICE DESCRIPTION: The one-call centre uses various official mapping sources to maintain an accurate or updated street centreline base map. The centre continues to update the map to account for new street names, addressed segments, as well as current and past place names. The map is refreshed at least twice a year and more frequently in areas where there is rapid growth.

2-25 RECEIVING LOCATE REQUESTS

PRACTICE STATEMENT: The one-call centre is the interface between the digging community, which includes all ground disturbers, and the 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 ground disturbers 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 ground disturber and registered facility owners.

2-26 MEMBERSHIP

PRACTICE STATEMENT: All owners of buried facilities 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 has a comprehensive marketing strategy to raise awareness in all facility owners of the benefits of having a membership with the centre. The process for joining is simple and barrier-free, and the services the centre offers are cost effective and meet the needs of facility owners.

If the one-call centre does not achieve satisfactory voluntary membership, the centre will work in cooperation with the BCCGA if it becomes necessary to form a multi-stakeholder task force in which to establish model regulations for the Province of British Columbia to consider.

2-27 GROUND DISTURBERS DUTY TO CONTACT

PRACTICE STATEMENT: Ground disturbers have a duty to contact the one-call centre to request locates prior to excavating.

PRACTICE DESCRIPTION: The one-call centre provides education to ground disturbers on why it is necessary to contact the centre before digging. The

centre employs best practices to ensure there is access to the centre at all times through a variety of means (i.e., phone, fax, email, remote entry, and so on). This practice is to also ensure the effectiveness and efficiency of the locate request process.

2-28 ADVISE GROUND DISTURBERS TO CONTACT NON-MEMBERS

PRACTICE STATEMENT: On every request by the ground disturber, the one-call centre advises that not all facility owners are members of the centre, and that the ground disturber must contact the non-members directly for locates before excavating.

PRACTICE DESCRIPTION: When a ground disturber submits a locate request, the one-call centre can only advise on the status of its members. In which case, the centre will inform the ground disturber that not all facility owners are members of the centre. Before digging, the ground disturber must contact any non-member directly for the dig site location. This best practice will continue until such time when all facility owners in British Columbia are members of the centre.

2-29 ACCEPT 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 personnel 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 ground disturbers using other common languages. The ticket documentation will always be processed in English.

2-30 THE ROLE OF ONE-CALL

PRACTICE STATEMENT: The one-call centre is the interface between the digging community (all excavators and ground disturbers) 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 website for members to post the status of their locate notifications on an individual ticket basis. The centre will accept requests from ground disturbers to reissue the notification to members who have not completed their locates by the work to begin date on the original request.

2-31 DIGGING ON PRIVATE PROPERTY

PRACTICE STATEMENT: The one-call centre reminds ground disturbers who are digging on private property to advise the centre if they are aware of any private lines situated on the property. It is the responsibility of the property owner to ensure its private lines are located before digging.

PRACTICE DESCRIPTION: The one-call centre issues a reminder to ground disturbers who are digging on private property to make the centre aware of any private lines that exist on the property. The centre will also advise that the ground disturber is responsible for ensuring 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. When there is knowledge of private lines buried within the area of the excavation site, the affected member may then work with the ground disturber to take whatever action is necessary.

2-32 BURIED FACILITIES NOT IDENTIFIED ON THE LOCATE SHEET

PRACTICE STATEMENT: The ground disturber contacts the one-call centre immediately upon discovering an unidentified facility within the excavation area.

PRACTICE DESCRIPTION: The one-call centre receives a detailed verbal description of the discovered unidentified facility from the ground disturber and then dispatches or forwards this information to the registered facility owner. This type of discovery constitutes an emergency notification.

3-0
LOCATING AND MARKING
PRACTICE STATEMENTS AND DESCRIPTIONS

British Columbia
BCCGA
Common Ground Alliance

3-0

LOCATING AND MARKING

3-1 USE OF RECORDS

PRACTICE STATEMENT: Facility locators use on-site facility records at all times. The order for relying on records should be:

1. On site records
2. Archive records
3. When no records are available, alternative save methods (i.e. electromagnetic or vacuum excavation)

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 accurate records is an effective method of identifying facilities as part of the locating process.

It may be necessary to delay the completion of the locate while archives are accessed, requiring immediate notification of all parties, under the following circumstances:

- Records are not available on-site and electromagnetic techniques cannot be used (for example, no tracer wire), and
- As-built/as-constructed records are available on-site but there exists no electromagnetic or alternative technique to physically locate the facility.

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.

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

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: A locator may note an error or omission during the course of a locating activity. Procedures should be in place to alert a facility owner/operator of the error or omission and to submit the change to the appropriate department or person in a timely manner. The facility owner/operator determines the method of notification, which includes the following information:

- Name (and company if contracted)
- Contact information of the person(s) submitting the change
- Location of change (either address or reference points)
- Size and type of facility
- Nature of the error or omission, and
- Sketch of the change in relation to other facilities

An error or omission may include the following but is not limited to:

- Missing or non-existent records
- Unmatched records used
- 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 damage to the facility at a later time.

3-3 COMMUNICATIONS

PRACTICE STATEMENT: Communication is established between all parties.

PRACTICE DESCRIPTION: One-call centres, facility owners/operators, and ground disturbers all have clearly defined processes in place to promote communication between all parties. In some cases, the complexity or duration of a project cannot provide a clear and precise understanding of the excavation

site and cannot be conveyed in writing on a locate request. When this occurs, a pre-location meeting is scheduled. This on-site meeting establishes the scope of the excavation.

If either of the locator(s) or ground disturber(s) requests this meeting, documentation between the parties should include the following information:

- Date
- Name (and company)
- Contact information for all parties
- List and 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 to be located are in writing and include all parties responsible for the excavation and marking of the excavation sites. Locators may also schedule meetings if the complexity of the markings require further explanation.

3-4 DAMAGE REPORTING

PRACTICE STATEMENT: A damaged facility or near miss is investigated and reported as soon as possible after the damage has occurred.

PRACTICE DESCRIPTION: Any time damage occurs, all parties should be informed and a proper investigation is to be performed. This investigation is to determine the party responsible and the root cause of the damage. The information gathered from the investigation is essential in preventing future occurrences of damage.

3-5 WORKLOAD PLANNING

PRACTICE STATEMENT: Forecasting and planning for predictable fluctuations in the workload 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. This practice is to ensure ticket requests are completed in a timely

manner. It also ensures that adequate personnel and equipment will be available to complete all locate requests. It should be noted this practice does not involve limiting the number of locate requests from ground disturbers.

3-6 TRAINING

PRACTICE STATEMENT: Locators are properly trained and the training is documented.

PRACTICE DESCRIPTION: Adopted for locator training are minimum training guidelines and practices that include the following components:

- 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/ Ground Disturber Relationships and Image
- Safety Procedures as per WorkSafeBC, British Columbia Safety Authority, BC Oil and Gas Commission, and National Energy Board
- Written and Field Testing
- Field Training, and
- Refresher Training

The National Utility Locating Contractors Association Locator Training Standards and Practices represent an accepted model within the locate industry. In addition, documentation of training is maintained to ensure facility locators have been properly trained. BCCGA and WorkSafeBC, in collaboration with other safety associations, have developed a BC-based introductory locating certification program.

3-7 LOCATING MULTIPLE FACILITIES

PRACTICE STATEMENT: Where practical, a single qualified locator is used for multiple facilities.

PRACTICE DESCRIPTION: This best practice does not suggest a single locator

is to locate all facilities. Rather, locating multiple facilities using a single locator may reduce the likelihood of errors and resulting damage. Three examples are as follows: a consortium of facility owners with an agreement to use one locator; multiple facilities having the same owner; or multiple facilities that are marked with the same or similar colour codes.

Using a single locator to mark multiple facilities provides several of the following advantages to both the facility and excavating communities:

- More responsive service to the excavation community
- Better communication with the excavating community (fewer points of contact)
- Increased safety due to less traffic on the road
- Improved worker safety
- Cost savings
- Reduced environmental impact, and
- Developed maps of multiple facilities

3-8 LOCATOR AND PUBLIC SAFETY

PRACTICE STATEMENT: Field locates are performed safely.

PRACTICE DESCRIPTION: It is the responsibility of the facility 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. Locators and/or employees are made aware of these hazards and properly trained in worker safety standards.

The following items should be considered as part of assessing and mitigating hazards on the job site when performing a locate:

- Communication between locator and other personnel at the job site, including the person responsible for safety on the worksite
- Locator should be aware of safety requirements and written emergency procedures to be followed on the project where applicable or establish his or her own
- Traffic control considerations, including vehicular movement and pedestrian activity
- Trip and fall hazards

- Sources of energy (overhead and other), and
- Environmental factors

3-9 LOCATE QUALITY

PRACTICE STATEMENT: Complete a visual inspection during the locating process

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PRACTICE DESCRIPTION: During the locating process, a visual inspection should be completed to include the following actions:

- Check all facilities within a facility owner/ operator service area (this is to evaluate the scope of the locate request)
- Identify access points such as dips, enclosures, manholes, meters, poles, risers, valves and pedestals
- Identify potential hazards, and
- Assure that plant facilities shown on available records match those of the site.

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

3-10 LOCATE STATUS

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 ground disturber. A positive response will include documentation and/or markings left on a job site, a callback, a fax, an email, or an automated response. This positive response allows the ground disturber to know whether all facility owners/operators have marked the requested area prior to the beginning of the excavation.

3-11 LOCATE METHOD PREFERENCES

PRACTICE STATEMENT: When locating a single target facility electromagnetically, an active/conductive locating method is usually preferable to a passive/inductive locating method.

PRACTICE DESCRIPTION: The preferred method of actively applying a signal onto a facility is to use direct connection. This method involves 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.

A direct connection usually provides the strongest signal on the line and is less likely to "bleed over" to adjacent facilities than other methods of applying a signal. Direct connection allows for a greater range of frequency and power output options. It is a good practice to use the lowest frequency possible at the lowest power output possible to complete the locate.

If direct connection is not possible, the use of an induction clamp (coupler) is the most effective method of applying a locate signal onto the target conductor. However, this method limits the choices of frequency and power outputs than offered by 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 for locating a single target facility is usually induction or broadcast mode on a transmitter. This method usually results in a weaker signal that may "bleed over" to another conductor in the area. There are situations where inductive locating gives the best results, such as on poor conductors with no access point. When searching an area for all conductors present, an inductive sweep using an ultra-high frequency is the preferred method to avoid damages.

When using any of the above three methods, the locator should trace the entire line from the point of signal application through the proposed work area.

ORIGIN/RATIONAL: It is very important that locators do not apply a signal application to a target underground facility and begin locating prior to isolating the grounding wire. Tracing continuously from the isolated grounding point of signal application past the end of the work area improves the accuracy of the locate.

Notable exceptions may include utility "Transmission" situations, where signal application opportunities may be limited (e.g. fibre optic networks, transmission pipelines and long distance power conductors). In these situations, to ensure that a reliable locate is achieved, attention should be paid to ensure a suitable signal launch is achieved. Subsequently, careful reference to distant locate signal characteristics should be made.

In cases where non-conductive utilities such as plastics cannot be located using electromagnetic means, radar-based methods such as Ground Penetrating Radar (GPR) and associated technologies can be used to determine the location of such utilities. It is important to note that these technologies are not applicable in all areas or conditions, because conductive soils and materials obscure radar signals. Users of these technologies should have the degree of knowledge and extensive training and experience required to operate the associated equipment and/or to interpret the results. Applicable radar frequencies range from 100 MHz to 2300 MHz, where higher frequencies provide higher resolution but shallower depth of penetration.

3-12 LOCATE RECORD

PRACTICE STATEMENT: Documentation of work performed on a locate is maintained.

PRACTICE DESCRIPTION: A locator always documents what work was completed on a locate request. This practice assists in the locate process. It makes the locator review what was located and verify that all facilities within the requested locate have been marked. Careful documentation helps to ensure there is an accurate record of the work completed by the locator. It also helps eliminate confusion over what work the ground disturber had requested.

3-13 THE LOCATED AREA

PRACTICE STATEMENT: The Located Area is properly established and identified on the Locate Form.

PRACTICE DESCRIPTION: The Located Area will be identified by a North, South, East, and West boundary and will be outlined and labelled 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 creates limits that are at least one metre from any

additional facilities to form a "buffer zone" around the Located Area. In all cases, the locator must clearly understand the scope and type of work to be performed prior to establishing the Located Area. Markings and sketched facilities do not extend beyond the Located Area either on the locate sheet or in the field.

3-14 ALTERNATE LOCATE AGREEMENTS

PRACTICE STATEMENT: Alternate Locate Agreements (ALAs), also referred to as variance agreements or permits, may be used providing the facility owner and ground disturber agree on the terms and conditions.

PRACTICE DESCRIPTION: An Alternate Locate Agreement (ALA) is a contractual agreement between a facility owner and a ground disturber that allows the ground disturber to proceed with 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. It also reduces the demand on existing locate providers and eliminates wait times and administration costs for the ground disturber.

The details of an ALA must be stated in writing and available on the project for review upon request. Such an agreement must also be communicated in writing to the Joint Health and Safety Committee, or health and safety representative on the project where applicable.

The ground disturber has the following responsibilities that the ALA would entail:

- Ensure all facility owners fulfill their locate requests and mark their services
- Ensure an ALA, where applicable and implemented, will not impede any safe operations regarding the utilities not covered by that ALA, and
- Maintain that the health and safety of the workers as well as public safety are safeguarded at all times

The ground disturber has a duty to ensure the excavation work is carried out in the following manner:

- In compliance with the legislative requirements, and
- In accordance with the ALA as stipulated between the ground disturber and the facility owner in question when and where applicable.

The facility owner has a duty to ensure the ALA terms and conditions will provide a level of safety equivalent to the standard locate process.

3-15 COLOUR CODE

PRACTICE STATEMENT: A uniform colour code and set of marking symbols is adopted throughout British Columbia.

PRACTICE DESCRIPTION: British Columbia adopts the standard of using a colour code to define the relevant facility types. This standard could resemble those accepted by the National Utility Locating Contractors Association or the American Public Works Association. Designated colours relate to specific types of underground facilities.

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

3-16 EXCAVATION SITE CONDITIONS

PRACTICE STATEMENT: Facilities are identified adequately for conditions.

PRACTICE DESCRIPTION: Facility locators match the markings to the existing and expected surface conditions. Markings may include use of, or in combination of, paint, chalk, flags, stakes, brushes, or offsets. Conditions that

can affect markings however are rain, snow, vegetation, high traffic, construction, and so forth. Paint marks will be a length of 30cm to 90cm and approximately 3 cm wide. All facility locators have the proper training to identify varying surface and environmental conditions that exist in the field and which marking methods to use.

Field marks should be placed at a minimum of 3-metre 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 40 centimetres (or 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:

Chart on pg 43 of ORCGA

3-17 MULTIPLE FACILITIES IN "JOINT USE" TRENCH

PRACTICE STATEMENT: Multiple facilities in a "joint-use" trench are marked individually and with corridor markers.

PRACTICE DESCRIPTION: The number of facilities marked on the surface is to equal the number of facilities buried below. All facilities within the same trench should be individually marked and identified. However, in situations where two facilities share the same colour code (i.e., telephone and CATV), both facilities should be identified and the marks placed on a parallel. There should be enough distance between the markers to readily identify each of them. In circumstances where a single facility owner/operator may not readily know the total number of lines buried in the same trench, a corridor marker is to be used. The corridor mark indicates the width of the facility.

3-18 FACILITY IDENTIFICATION

PRACTICE STATEMENT: The owner or operator of a facility is identified.

PRACTICE DESCRIPTION: The facility owner/operator is identified by the markings placed at the time the facility is located. This practice is to prompt a positive response for all located facilities within the requested area.

The National Utility Locating Contractors Association (NULCA) Marking Standards recommend, "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 material size and type of the facility (when available) should be identified on the locate form.

3-19 IDENTIFICATION OF DEMARCATION POINT

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.

PRACTICE DESCRIPTION: When locating and marking the underground plant of the facility owner, the locator indicates the demarcation point of the facility being located on the locate sheet. This symbol (as above) is 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 the utility owned facilities. The ground disturber 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.

3-20 LOCATE REPORT

PRACTICE STATEMENT: A written report which may be referred to as the Locate Report of Buried Plant Locate Report of Locate Sheet should be issued by the locator in order to provide details and instructions for the locate and to confirm that the locate has been completed.

PRACTICE DESCRIPTION: In order to complete the locate process it is necessary to provide sufficient information that parties relying on this for excavation purposes will be able to correctly interpret the marks in the field and

be aware of the instructions, warnings, and limitations of the locate. This information should be provided in a Locate Report that is legible and that groups similar types of information in a logical and consistent order.

While the exact appearance, formatting, inclusions, exclusions and order of elements may vary in a Locate Report, these should be similar to and consistent with the following generic format, even in emergency situations where all information provided is hand written.

3-21 MARKING OF NEWLY INSTALLED FACILITIES

PRACTICE STATEMENT: Markings are placed immediately after construction to identify the location of newly installed facilities.

PRACTICE DESCRIPTION: Newly installed facilities are often at risk as locators and excavators may not be aware of the recent installation, especially if the installation has taken place immediately before or after the completion of a locate. Markings such as paint and/or special flags warning that new facilities have been installed should be placed as soon as the construction is completed. This practice increases the chances of the excavator or locator being made aware or the installation, which can reduce the chances of the facilities being damaged.

4-0
EXCAVATION
PRACTICE STATEMENTS AND DESCRIPTIONS

British Columbia
BCCGA
Common Ground Alliance

4-0

EXCAVATION

4-1 ONE-CALL /PRIVATE OPERATOR LOCATE REQUEST

PRACTICE STATEMENT: The ground disturber notifies the facility owner or operator through the one-call centre to request the location of underground facilities at each site. Unless otherwise specified by law, the ground disturber must contact the centre at least three business days in advance of excavation activities.

In BC, it is important to note that not all facility owners are members of One-Call. Ground disturbers are responsible to research and contact all facilities/operators that could be present in their ground disturbance worksites.

PRACTICE DESCRIPTION: Increased participation in a one-call notification system improves communication between ground disturbers and facility owners/operators and also helps to reduce damage to facilities. Ideally, it would be mandatory for all utility owners to have membership in this system.

Regulation in the province requires that ground disturbers provide a minimum of three business days notice before excavation. The one-call centre believes that to excavate without giving prior notice can pose a risk to public safety, ground disturbers, and the environment. It can also disrupt the vital services that facility owners provide.

REFERENCES: Existing British Columbia acts and regulations.

4-2 PRIVATELY OWNED FACILITIES

PRACTICE STATEMENT: Prior to excavating, the ground disturber 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 his or her 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 (i.e. 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: Existing British Columbia acts and regulations.

4-3 WHITE LINING

PRACTICE STATEMENT: When the excavation site cannot be identified clearly or adequately on the locate ticket, the ground disturber uses white pre-marking or lining to designate the route and/or area to be excavated before the arrival of the locator.

PRACTICE DESCRIPTION: The excavation route is marked with white paint, flags, stakes, or a combination of these. This marking is to outline the excavation site prior to notifying the one-call centre and/or private operator and before the locator arrives on site. With the use of white pre-marking or lining, ground disturbers can clearly communicate to facility owners/operators or their locators where the excavation is to take place. Note, however, the BCCGA does not recommend this practice during the winter months or where snow is prevalent.

REFERENCE: The National Transportation Safety Board (U.S.) conducted a 1997 safety study, "Protecting Public Safety through Excavation Damage Prevention," which found pre-marking is a practice that helps prevent excavation damage.

4-4 LOCATE REFERENCE NUMBER

PRACTICE STATEMENT: The ground disturber receives and maintains a reference number from the one-call centre that verifies that the locate was requested.

PRACTICE DESCRIPTION: Each call from a ground disturber that is processed by the one-call centre is assigned its own message reference number, which is contained on all locate request messages. The ground disturber records this number and uses it as proof of notification to one-call members. The computer-generated request identifies the date, time, and sequence number of the locate request.

Every locate request ticket, or notification, has its own number that separates it from all other tickets. This practice allows the ticket to be kept in the archives and recalled for later use.

4-5 PRE-EXCAVATION MEETING

PRACTICE STATEMENT: When necessary, the ground disturber or the locator may request a pre-excavating meeting at the site of the proposed excavation just prior to the actual marking of the facility locations. This type of meeting is important in the case of a major or unusual excavation.

PRACTICE DESCRIPTION: Pre-excavating meetings among the ground disturber, facility owner/operator, and locator are to facilitate communications, coordinate the markings with the actual excavation, and assure identification of high priority facilities. It is recommended to arrange a meeting for any major or large project.

These types of projects could include road, sewer, water, or other projects that cover a large area. It could also include projects that progress from one area to the next, or are located near critical or high priority facilities, such as high-pressure gas, high voltage electrical, fibre optic communications, and major pipe or water lines.

REFERENCE: Existing National Energy Board regulations and existing practices among ground disturbers, utility companies, and locators.

4-6 FACILITY RELOCATION

PRACTICE STATEMENT: The ground disturber coordinates work with the affected facility owner or operator in all cases that require the temporary or permanent interruption of services of a facility.

PRACTICE DESCRIPTION: The facility owner or operator and the ground disturber actively participate in the relocation of a facility that requires any temporary or permanent interruption to that facility. This practice is to ensure the protection of facilities through a joint effort that may involve a preplanning conference call or meeting.

REFERENCE: Existing practices among ground disturbers, utility companies, and project owners.

4-7 SEPARATE LOCATE REQUESTS

PRACTICE STATEMENT: Every ground disturber on the job has a separate one-call centre reference number and an appropriate locate form before excavating.

PRACTICE DESCRIPTION: Several ground disturbers may be performing work on a job site. At the same time, the construction schedule may involve various types of excavation activities and may require specialty contractors to work simultaneously. As such, all ground disturbers should obtain their own separate locates before excavating. This practice ensures that affected underground facility owners or operators have appropriately marked the specific areas.

If there are multiple users on the same project who rely on a single locate, the ground disturber is responsible for ensuring the locate is appropriate for the intended excavation. In doing so, the ground disturber must consider the following conditions:

- Limits of the located area
- Depth of the excavation
- Ticket life, and
- Existence of any facilities installed since the locate was performed

REFERENCE: Existing provincial law and acts

4-8 ONE-CALL 24/7 ACCESS

PRACTICE STATEMENT: The ground disturber has access to the one-call centre 24 hours per day, 7 days a week.

PRACTICE DESCRIPTION: Utilities service the public needs 24 hours a day, 7 days a week. Similarly, utilities require coverage from the one-call centre for the same amount of time. There are times and conditions, such as city and road congestion, and off peak utility service hours that require ground disturbers to work during off hours. Although most ground disturbers are on site during regular work hours, having access to the centre at all hours to call in future work locations allows for more flexible work schedules.

CURRENT PRACTICE: There are two separate deficiencies in this practice. First, not all utilities have become members of the one-call centre. Second, at the moment, not all locates are available 24 hours a day, 7 days a week for all utilities.

4-9 POSITIVE RESPONSE

PRACTICE STATEMENT: The ground disturber receives at least a written notification from the underground facility owner or operator in response to a locate request.

PRACTICE DESCRIPTION: A positive response is the action a facility owner or operator takes after receiving a notification of intent to excavate by a ground disturber. The facility owner or operator is required to take one of two actions. The first is to mark the underground facilities at the worksite identified on the locate sheet provided to the ground disturber by using flags, markings, or other acceptable methods. The other action is to notify the ground disturber verbally and in writing that the situation is "all clear." The positive response should be given within three business days of the locate request or by a date that the locator and ground disturber can agree upon.

A conflict exists if there are underground facilities near the proposed excavation or demolition work. It is until the one-call centre, facility owner, or facility operator determines that a conflict does not exist that the ground disturber is to receive a written notification the area is "all clear."

At times, the ground disturber may have received an "all clear" response, but has knowledge that an underground facility does in fact exist in the proposed excavation or demolition area. In this case, the ground disturber notifies the one-call centre and the facility owner or operator of this fact. The priority would be for the one-call centre and the facility owner or operator to make sure these facilities are marked before the excavation or demolition work begins.

An important note, the ground disturber should maintain written records of all locates requested and received.

CAUTION: In BC, not all facility owners are members of BC One Call and not all facility owners provide locates. It is important to check with both BC One Call and the non-member facility owners to determine their procedures and requirements.

4-10 FACILITY OWNER OR OPERATOR FAILURE TO RESPOND

PRACTICE STATEMENT: The ground disturber calls the one-call centre again when the facility owner or operator fails to provide a positive response.

PRACTICE DESCRIPTION: It is important for the ground disturber to follow up with the one-call centre when the following two circumstances arise. First, the facility owner or operator fails to respond to the timely request for a locate by the ground disturber within the time specified by provincial requirements. Second, the facility owner or operator that does locates, notifies the ground disturber that the underground facility cannot be marked within the time frame nor the mutually agreed upon date.

The one-call centre contacts the facility owner or operator to determine the reason for failing to respond or the delay, and raises the status of the locate to an overdue locate. Where practicable, the facility owner or operator responds with the locate and supporting documentation within two hours.

Essentially, the ground disturber and facility owner/operator are to work together to ensure that facilities are marked in an acceptable time frame to allow for the protection of the underground facilities.

4-11 LOCATE VERIFICATION

PRACTICE STATEMENT: Prior to excavation, the ground disturber verifies that the limits of the locate markings correspond with the limits of the proposed excavation.

PRACTICE DESCRIPTION: Before excavation begins, the ground disturber arrives at the excavation site and ensures the limits of work area are clearly identified on the one-call/private operator submission form. The ground disturber is responsible for ensuring that all utilities are marked, which includes corresponding the markings with the colour codes. To the best of his or her ability, the ground disturber also checks for unmarked facilities that are readily visible. Such signs as pedestals, risers, meters, new trench lines, and service feeds from buildings and homes can all indicate the existence of an underground facility.

When there are readily visible signs of an unmarked facility and the as-built drawings supplied are incomplete, inaccurate, or has a discrepancy, the ground

disturber contacts the project owner in order to have the facility located or can contact the locator directly. If the locate is not corrected within four hours, the ground disturber can elevate the status of the locate to an overdue locate to the one-call centre.

SUGGESTED PRACTICE: A responsible ground disturber uses a pre-excavation checklist. Insurers recommend all ground disturbers use some form of a pre-excavation checklist.

4-12 WORKSITE REVIEW WITH COMPANY PERSONNEL

PRACTICE STATEMENT: The ground disturber or an authorized person (i.e. foreman or site superintendent) reviews the location of underground facilities with site personnel prior to starting the work.

PRACTICE DESCRIPTION: The sharing of information and safety issues during an on-site meeting between the ground disturber and his or her crew helps to avoid confusion and unnecessary damage to underground facilities.

REFERENCE: Existing practice by ground disturbers under the Workers Compensation Act, and as per WorkSafeBC.

4-13 CONTACT NAMES AND NUMBERS

PRACTICE STATEMENT: The authorized person at each job site, as designated by the ground disturber, has access to the contact names and numbers of all facility owners/operators as well as the one-call centre. These contact names and numbers will be displayed on the locate sheet or excavation checklist.

PRACTICE DESCRIPTION: There may be situations on the job site when it is critical to immediately notify facility owners/operators, the one-call centre, or local emergency personnel. In order to avoid delays, the ground disturber ensures all designated site personnel have all the appropriate contact names and numbers.

4-14 FACILITY AVOIDANCE

PRACTICE STATEMENT: The ground disturber exercises reasonable care and practices to avoid damaging underground facilities.

PRACTICE DESCRIPTION: Safety is the first priority on any construction project. Ground disturbers that use caution around underground facilities contribute significantly to the safe excavation of existing facilities.

REFERENCE: As per the Occupational Health and Safety Regulation, the Workers Compensation Act, and WorkSafeBC.

4-15 FEDERAL AND PROVINCIAL REGULATIONS

PRACTICE STATEMENT: The ground disturber adheres to all applicable federal and provincial occupational health and safety regulations and legislation.

PRACTICE DESCRIPTION: It is important for best practices to include references to worker safety and training. In order to protect their employees from injury and illness, ground disturbers are required to comply with federal and provincial occupation health and safety regulations. Each employee should receive training on how to recognize and avoid conditions that are unsafe. They should also have knowledge on the applicable regulations to his or her work environment in order to control or eliminate any hazards or exposures that may cause injury or illness. As such, as part of the safety training, the employees will be informed of the applicable regulations to the protection of underground facilities, workers, and the public.

REFERENCE: As per federal and provincial acts and regulations and the existing practices by ground disturbers, facility owners, and facility operators.

4-16 MARKING PRESERVATION

PRACTICE STATEMENT: Where practicable, the ground disturber protects and preserves the staking, marking, or other designations for the underground facilities. This practice continues until the markings are no longer required for proper and safe excavation. If any facility mark is removed or no longer visible, the ground disturber stops the excavation, notifies the one-call centre/private operator and the locator to arrange to have the facility re-marked (Refer to Module 3: Locating and Marking)).

PRACTICE DESCRIPTION: In the case of long complex projects, the marks for identifying underground facilities may need to be in place for a period longer than the locating method can withstand. As a result, paint, staking, and other

marking techniques can last only as long as the weather and other variables will allow. When a mark is no longer visible, but the work around the facility needs to continue, the ground disturber requests for a remark to ensure the protection of the facility.

REFERENCE: The existing practices of ground disturbers and facility owners and operators.

4-17 EXCAVATION OBSERVER

PRACTICE STATEMENT: The ground disturber assigns an observer to assist the equipment operator during the operation of excavation equipment around known underground facilities.

PRACTICE DESCRIPTION: An observer is a worker who watches the excavation activity for the purpose of warning the equipment operator during excavation around a utility. This practice is to prevent causing damage to the facility and is a common practice among ground disturbers and large facility owners/operators.

4-18 EXCAVATION TOLERANCE ZONE

PRACTICE STATEMENT: The ground disturber observes the tolerance zone, which is the space in which the line or facility is located.

PRACTICE DESCRIPTION: The tolerance zone covers the width of one metre from the centerline of a located cable or conduit and one metre from either side of the outside edge of the underground facility on a horizontal plane. The ground disturber takes special care of this zone, but this practice is not intended to pre-empt any existing federal or provincial regulations.

REFERENCE: Existing guidelines for excavating within the vicinity of underground facilities.

4-19 EXCAVATION WITHIN TOLERANCE ZONE

PRACTICE STATEMENT: The ground disturber exercises the necessary care to protect any underground facility in or near the excavation area when excavation is to take place within the specified tolerance zone.

PRACTICE DESCRIPTION: The ground disturber must consider various geological conditions and weather-related factors when excavating within a tolerance zone. Based on these variables, the ground disturber may wish to consider using these methods: hand digging, wherever practical; hydroexcavation; and pneumatic hand tools.

In general, methods that are safe, prudent, and non-invasive are low-risk practices for manually exposing a facility. Other considerations include the use of mechanical methods with the approval of the facility owner or operator and other technical methods that may be in development.

Hand digging and non-invasive methods are not required for pavement removal. Some guidelines, however, specifically allow the use of power excavating equipment for excavating in the area of utilities. This type of equipment can be used for the removal of pavement and sidewalks, but not curbs nor base materials.

REFERENCE: Existing excavating guidelines as set by federal and provincial authorities and practiced by various utility owners and operators.

4-20 UNIDENTIFIED FACILITIES

PRACTICE STATEMENT: Upon the discovery of an inaccurately marked or unidentified underground facility, the ground disturber notifies the facility owner or operator either directly or through the one-call centre.

PRACTICE DESCRIPTION: All excavating activity in the vicinity of a facility must stop when a ground disturber finds an inaccurately marked or unidentified facility. The ground disturber must then notify the facility owner or operator. Following this notification, the ground disturber may only proceed with the excavation if the work can be done without damaging the facility. If the excavation is to continue, a non-invasive excavation practice should be employed (i.e. hydroexcavation and/or hand digging). In all cases, the ground disturber must protect the facilities from damage and avoid damaging and interfering with the other facilities.

REFERENCE: Existing practices by diligent and responsible ground disturbers.

4-21 EXPOSED FACILITY PROTECTION

PRACTICE STATEMENT: Ground disturbers support and protect exposed underground facilities from damage.

PRACTICE DESCRIPTION: Protecting exposed underground facilities is as equally important as preventing damage to facilities when excavating around the utility. This practice helps to ensure the utility does not get damaged, while at the same time protect the employees who are working in the area of the exposed facility.

The soil around the facility may no longer be able to support nor protect the facility, causing it to shift, separate, or become damaged. To prevent this, the ground disturber can protect the exposed facility by adding a support or brace. Methods include shoring the facility from below or providing a timber support with hangers across the top of an excavation.

The ground disturber must ensure to instruct workers not to climb on, strike, or try to move exposed facilities. These actions can lead to the following results:

- Damage to protective coatings
- Bending of conduits
- Separation of pipe joints
- Damage to cable insulation and fibre optics, and
- Affect the integrity of the facility in some way

REFERENCE: Existing acts and regulations.

4-22 LOCATE REQUEST UPDATES

PRACTICE STATEMENT: It is a best practice to define the life of a ticket. If the excavation continues past the date shown on the ticket, the ground disturber contacts the one-call centre in order to refresh the ticket.

PRACTICE DESCRIPTION: The maximum life of the ticket should be 30 calendar days from the date the locate was requested (unless otherwise specified by federal or provincial law). If the excavation activity has not **started** within 14 calendar days of placing the request or the excavation activity needs to **extend beyond** 30 calendar days from the date the locate was requested the ground disturber will need to refresh the ticket through the one-call centre.

There are several reasons for needing to refresh a locate ticket:

- Facility markings are only temporary
- A job may not be completed before the ticket date
- New facilities may have been installed in the proposed excavation area after the original notification, and
- The excavation may cover a large area

In the case of an excavation that covers a large area and will progress from one area to another over a period of time, the excavation work is to be broken into segments. The ground disturber, facility owner or operator, and the locator need to agree on these segments. This practice is to allow for the markings to coordinate with the actual excavation.

Many facility owners/operators do not perform their own locates. Instead, they use a contracted facility locator. However, the locator may not be aware of the work planned in the near future. When the ground disturber refreshes a locate ticket, it gives the locator the opportunity to identify newly placed facilities.

Refreshing a locate ticket allows facility owners or operators another chance to identify the location of their facilities. This practice helps them to avoid possible damage and a disruption of service in case the facility had been marked incorrectly or missed on a previous locate.

REFERENCES: Existing regulations and practices among ground disturbers, facility owners and operators, and locators.

4-23 FACILITY DAMAGE NOTIFICATION

PRACTICE STATEMENT: The ground disturber who discovers or causes damage to an underground facility notifies the facility owner or operator that is identified on the locate form. The ground disturber reports immediately all breaks, leaks, nicks, dents, gouges, grooves, or other damages to facility lines, conduits, coatings, or cathodic protection.

PRACTICE DESCRIPTION: Damage to a facility dramatically increases the possibility of facility failure or endangerment to the surrounding population. Even though the facility may not fail immediately, the ground disturber should notify the facility owner or operator to allow for the opportunity to inspect the damage and make the appropriate repairs.

REFERENCE: Existing practices by diligent and responsible ground disturbers.

4-24 NOTIFICATION OF EMERGENCY PERSONNEL

PRACTICE STATEMENT: The ground disturber immediately notifies the appropriate emergency personnel and the facility owner or operator if damage to a facility results in the following cases: escape of any flammable, toxic, or corrosive gas or liquid; or endangerment of life, health, property, or the environment.

PRACTICE DESCRIPTION: Until emergency personnel arrive on site, the ground disturber takes the necessary actions to protect workers and others in immediate danger, the general public, property, and the environment. The ground disturber should base these actions on his or her knowledge, training, resources, experience, and understanding of the situation. The ground disturber remains on the site to convey any relevant information that could help the emergency personnel safely mitigate the situation.

For the ground disturber to notify the proper authorities to manage the situation minimizes the danger to life, health, and property. Emergency personnel, first responders, and local authorities have access to resources to employ evacuation procedures that may not be available to the ground disturber nor the underground facility owner or operator.

REFERENCE: Existing regulations and guidelines by federal and provincial authorities and practices by diligent and responsible ground disturbers.

4-25 EMERGENCY EXCAVATION

PRACTICE STATEMENT: In an emergency excavation situation, the ground disturber notifies the one-call centre, and the facility owner/operator to request an emergency locate.

PRACTICE DESCRIPTION: Provincial regulations require that ground disturbers determine the location of buried facilities in the area before commencing work, which includes any emergency situation.

REFERENCE: Existing provincial regulations and practices among ground disturbers and facility owners/operators.

4-26 BACKFILLING

PRACTICE STATEMENT: The ground disturber protects all facilities from damage when backfilling an excavation.

PRACTICE DESCRIPTION: THE EXCAVATOR SHOULD PROVIDE SUITABLE BEDDING MATERIAL TO SURROUND AND PROTECT THE FACILITY(S). The ground disturber ensures to take extra caution to remove large rocks, sharp objects, and large chunks of hard packed clay or dirt. Refuse or pieces of abandoned lines are not to be backfilled into the trench. Ground disturbers should also be placing and compacting bedding material to the facility owner or municipal authority's requirements. This practice is to help avoid damaging a facility during the backfill process.

REFERENCE: Existing federal and provincial regulations and existing practices among ground disturbers.

4-27 AS-BUILT DOCUMENTATION

PRACTICE STATEMENT: The contractor who installs an underground facility notifies the facility owner or operator if the actual placement of the facility is different from the placement identified in the plans.

PRACTICE DESCRIPTION: Facility owners and operators must maintain accurate records of the locations of their facilities. As such, the contractor that installs a new facility that deviates from the planned installation will be required to notify the facility owner or operator of this change. After receiving this notification, the facility owner or operator has the responsibility of updating their records. This update is to allow for an accurate locate of the facility in the future.

The changes in the plan can be either or both horizontal and vertical distances from the specified plans. In either case, the facility owner or operator should establish standards, which require notification if the change is beyond specific tolerances; for example, a change in depth of 150 millimetres or more and a lateral measurement change of more than 300 millimetres.

REFERENCE: Existing practices among diligent and responsible ground disturbers and facility owners/operators.

4-28 VACUUM EXCAVATION DEFINITION

PRACTICE STATEMENT: Hydroexcavation is defined as a mechanical means of soil extraction through a 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: Hydroexcavation is a non-invasive means of extracting soil through a vacuum while using water or air jet devices for breaking ground. This is a safe method of excavating around utilities if the equipment has been designed and engineered to do so. When preparing a hydroexcavation, considerations should include: variable pump adjustments and thresholds, shoring and backfilling, dig tube segregated ends, neoprene lance ends, neoprene dig tube ends, appropriate boiler temperature, equipotential bond mat, and correct training on utility excavations.

4-29 OPERATOR COMPETENCY – VACUUM EXCAVATING

PRACTICE STATEMENT: All operators of hydroexcavation equipment have the knowledge, training, and experience to perform the work. Operators are also familiar with the Workers Compensation Act, WorkSafeBC regulations, and have knowledge of all potential or actual danger to health and safety in the workplace.

PRACTICE DESCRIPTION: To operate hydroexcavating equipment, operators will have the necessary minimum training as recognized by industry. Operators will also have knowledge of (1) defined work practices, and (2) specific procedures as recommended by manufacturers of the equipment.

REFERENCE: Training guidelines as outlined by equipment manufacturers and facility owners.

4-30 SAFE OPERATION OF VACUUM EXCAVATION EQUIPMENT

PRACTICE STATEMENT: Hydroexcavation equipment is to be operated in accordance with recognized practices and procedures that provide the necessary levels of worker and public safety and prevent damage to underground utilities.

PRACTICE DESCRIPTION: Providing that the hydroexcavating equipment has been designed and engineered for excavation as per the manufacturer, it can be used to excavate safely around utilities. To ensure the safe operation of the equipment, ground disturbers must have at least the minimum set of documents in place:

- Company safety program
- Written job procedures for hydroexcavation, and
- Contractor's equipment specifications and/or job procedures

The first two documents must be available and accessible for review upon request by a representative of a facility owner.

4-31 FROZEN GROUND EXCAVATION

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

PRACTICE DESCRIPTION: Using conventional mechanical excavation equipment to excavate in the tolerance zone in frozen ground may damage a buried facility surrounded by frozen ground. This practice may cause damage by either direct contact to the underground plant or by moving the frozen ground that encases the underground plant. The preferred method would be to use a hydrovac with heated water (less than 45 degrees Celsius at the wand tip).

REFERENCE: This is a practice many ground disturbers currently use.

4-32 UTILITY OWNER ACCEPTANCE OF VACUUM EXCAVATION PRACTICES

PRACTICE STATEMENT: The ground disturber contacts the utility owner to determine what the restrictions are for using hydroexcavation practices around the utility plant.

PRACTICE DESCRIPTION: Each utility has its own specific criterion for safe excavating practices. This criterion includes having restrictions on the use of hydroexcavation methods. If the ground disturber wishes to use this method, he or she should contact the utility owner to find out which specific criterion is

acceptable before starting the excavation. The utility owner may have certain procedures and operating criteria that the ground disturber needs to follow.

As utility owners have differing views on safe excavating practices, they all recognize the benefits of damage prevention. However, it may be necessary for utility owners to work together to establish a common set of standards, processes, and procedures that all damage prevention stakeholders can accept and adopt.

4-33 PROTECTION OF SURVEY INFRASTRUCTURE

PRACTICE STATEMENT: Every ground disturber is responsible for recognizing and ensuring the integrity of survey infrastructure.

PRACTICE DESCRIPTION: Every ground disturber 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, “Everyone who wilfully 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.”

2. Petroleum and Natural Gas Act (British Columbia)

3. Geophysical Exploration Regulation, Section 7- Survey monuments (British Columbia)

4-34 EXCAVATION AND PUBLIC SAFETY

PRACTICE STATEMENT: Excavations are performed safely.

PRACTICE DESCRIPTION: It is the responsibility of the facility owner/operator and ground disturber to establish when and how to perform the excavation. It would also mean the establishment of appropriate measures that conform to federal, provincial, local and industry standards. As well, all hazards associated with the excavation are identified. Employees are also made aware of these hazards and properly trained in worker safety standards. In addition, appropriate safeguards are put in place to protect the public.

The following items should also be considered in performing an excavation safely:

- Soil classification
- Traffic control, including passing vehicles and pedestrians
- Construction vehicular movement
- Trip and fall hazards
- Adjacent structures and/or facilities
- Maintaining clear distances on top of excavations for materials and equipment
- Sources of energy (overhead and other), and
- Environmental factors

4-35 PRE-DEMOLITION VERIFICATION PROCESS

PRACTICE STATEMENT: The excavation/demolition contractor shall have a process to verify all utility disconnects and their termination points, prior to demolition.

PRACTICE DESCRIPTION: The excavator/demolition contractor shall receive and review the demolition permit and ensure that all utilities have been capped or terminated. Furthermore, the contractor shall verify the termination points as required (may include utility locates, site inspection, obtaining confirmation/as built drawings from utilities).

5-0
MAPPING
PRACTICE STATEMENTS AND DESCRIPTIONS

British Columbia
BCCGA
Common Ground Alliance

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MAPPING

5-1 ONE-CALL CENTRE RESPONSIBILITIES AND USE OF MAPPING

PRACTICE STATEMENT: The one-call centre uses a land base in its mapping system that is accurate and updated when new information becomes available from source suppliers. Facility owners/operators provide regular updates of their notification mapping coverage to ensure the most current information is utilized in the system. The land base used is available to the public, and is able to produce a ticket for the smallest practical geographical area that utilizes latitude and longitude co-ordinates to describe the location.

PRACTICE DESCRIPTION: The land base should be precise, current, and contain the most complete coverage available. It should be geographically correct to a reasonable degree as well as cost effective. The information from the land base should permit for two way conversion and/or exchange of data. The user should only need to utilize a single standard geographic reference.

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

The mapping system should have the capacity to produce a ticket for the smallest practical geographical area suitable to the requirements of the member of the one-call centre. The system should also have the flexibility to handle the various sources of information contained.

The land base should be made available for public viewing (ground disturbers, project owners, homeowners, etc.) to validate limits of dig areas. The land base and database should be also available to the members of the one-call centre in order to update membership database information.

5-2 LOCATOR RESPONSIBILITIES AND USE OF MAPPING

PRACTICE STATEMENT: Locators use mapping as a resource to find an excavation site and to determine the general location of the buried facility. The locator notifies the facility owner/operator as well as the one-call centre of any discrepancy over the map and the location of the facility.

PRACTICE DESCRIPTION: Locators should have the proper training to read facility distribution maps and associated map symbology in order to determine the location of buried facilities. The locator will use both locating equipment and mapping to provide the locate. If the locating equipment determines that the mapping and the location do not coincide, the locator must notify the facility owner/operator. The locator must also make the one-call centre aware of the discrepancy.

CURRENT PRACTICE: The locator can contact the one-call centre as well as the facility owner/operator to log the discrepancies. Additionally, most utilities have internal processes in place for updating facilities mapping when notified of a discrepancy.

5-3 GROUND DISTURBER RESPONSIBILITIES AND USE OF MAPPING

PRACTICE STATEMENT: The ground disturber provides the one-call centre with accurate location information.

PRACTICE DESCRIPTION: The ground disturber is responsible for providing accurate excavation location information to the one-call centre. Information should include street address, street intersections, legal description, and other acceptable latitude and longitude coordinates if feasible. Refer to Best Practice 2-16 for a list of requirements.

If the ground disturber is unable to provide the location, the ground disturber must coordinate with the one-call-centre to establish the location. This practice is to establish the excavation area and provide a description of it on the locate form. Sometimes, it may be necessary for the ground disturber to coordinate with the facility locator to establish this location.

5-4 OWNER / OPERATOR RESPONSIBILITIES AND USE OF MAPPING

PRACTICE STATEMENT: The facility owner or operator collects detailed location information on existing and newly constructed facilities and provides mapping data to the one-call centre and locator on a consistent basis.

PRACTICE DESCRIPTION: The facility owner/operator is to provide the one-call center and locator with data (i.e. electronic or paper records, fiche, or other indexing of underground facilities), which should enable the following actions:

- Proper ticket creation and notification of excavation activities near the facility owner/operator's infrastructure, and
- The locator to accurately mark the underground facility

Facility owners are encouraged to provide digital information.

The facility owner/operator should ensure as-built drawings are of sufficient detail. The drawings should also show an accurate relationship to some defined reference system so that the location of the plant can be re-established at a later date (i.e. physical permanent structure, survey monuments, and horizontal and vertical coordinates).

Facility owners are be responsible for verifying any discrepancies reported to them as part of editing their mapping databases.

The facility owners/operators should apply the mapping system standards consistently across their facilities. Various plant owners/operators, however, have standards that may 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 his or her longitudinal utility:

- Any new construction into the electronic mapping database in an as-built state at the time of installation.
- The location of abandoned or sold facilities is retained in the database.
- The electronic mapping database includes the following detailed information:
    - Engineering stationing and milepost/marker post location, with latitude and longitude co-ordinates. Common mapping coordinate systems that allow conversion to latitude and longitude are used.

- Alignment of the utility with engineering stationing at each running line change or PI (point of inflection) including signs and markers.
- Bridges, culverts, and rivers.
- All road crossings, overhead viaducts and underpasses, including name of the street (public or private) and mile marker/marker post designation.
- Small scale maps that show the overall utility route.
- Physical characteristics and attributes of the system, such as pedestal, pole, transformer, meter numbers, anode bed, size, material, product, and pressure.
- The number of utility lines or conduits owned by the facility owner/operator in a corridor, or the size of the duct package/bank.
- Records processed by Subsurface Utility Engineering on the actual locations prior to design of new installations.

CURRENT PRACTICE: The one-call centre should be able to receive either a digital or hard copy of the information. However, the onus remains on the centre members to provide updates in a facility owner designated format. The facility owner/operator uses this format to provide facility information to locators. In addition, centre members who wish to exchange digital information can use a standard "common file" for spatial information.

REFERENCE:

Port Alberni, BC, Engineering Specifications Manual, Section B-2 As-Built Records. See Engineering Services at www.city.port-alberni.bc.ca.

Nanaimo, BC, Manual of Engineering Standards and Specifications. See Infrastructure Planning under Engineering/Public Works department at www.nanaimo.ca.

5-5 PROJECT OWNER RESPONSIBILITIES AND USE OF MAPPING

PRACTICE STATEMENT: The project owner provides accurate information on the scope of the work and determines the starting and ending points of the excavation area. Providing the basic coordinates should define the centerline or area of construction.

PRACTICE DESCRIPTION: The project owner is responsible for providing the ground disturber with accurate location information on the proposed excavation area as well as the scope of the work. The information on the excavation activity should include a street address and intersection, starting and ending points, and a legal description. It should also include on which side of the property the excavation is to take place, the distance of the excavation area from the nearest intersection, and the latitude and longitude coordinates (in one-call centre format) of the excavation area.

CURRENT PRACTICE:

- Project owner provides information to ground disturber that is referenced to the call centre map.
- "Starting and ending points" tend to be descriptions and not co-ordinates; however, a 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 or may not be tied to universal survey control points.

5-6 AVAILABILITY OF LAND BASE TO THE PUBLIC

PRACTICE STATEMENT: The one-call centre should make the land base available to the public.

PRACTICE DESCRIPTION: The public (ground disturbers, project owners, homeowners, and so forth) should have viewing access to the land base, wherever they are legally entitled to. This access is to allow them to retrieve information about locates. Members of the one-call centre should also have access to the land base as well as the database for the purpose of updating member database information.

6-0
COMPLIANCE
PRACTICE STATEMENTS AND DESCRIPTIONS

British Columbia
BCCGA
Common Ground Alliance

6-0

COMPLIANCE

6-1 PUBLIC EDUCATION

PRACTICE STATEMENT: Public education programs are used to promote compliance. Annual programs integrate recommendations from investigations of violations having occurred in the prior year, in order to assure the optimal effectiveness of current year programs.

PRACTICE DESCRIPTION: The BCCGA develops and promotes public education programs on excavation compliance. These programs are to educate all stakeholders of existing damage prevention practices, laws, and regulations. The BCCGA will document, publish, and promote the programs through the most effective means as per its Education and Communication Committee.

Individual stakeholders are encouraged to provide feedback or other educational programs in line with the goals and objectives of the BCCGA. The public education programs on compliance have the following intentions: to create diligence surrounding excavation activity in the province; and, for the BCCGA to address in its annual public awareness campaigns and education program curricula current worker and public safety issues known to the BCCGA.

REFERENCE: BCCGA DigSafe Series

6-2 ENFORCEMENT EDUCATION

PRACTICE STATEMENT: Education is a mandatory alternative or supplement for the penalties to offenders of damage prevention laws and regulations.

PRACTICE DESCRIPTION: Mandatory education is an effective alternative after a violation of the damage prevention best practices, laws, or regulations has occurred. Making education mandatory as an enforcement tool promotes compliance with damage prevention best practices.

REFERENCE: Any one or combination of the following entities — BCCGA, British Columbia Safety Authority, WorkSafeBC, BC One Call or, where

appropriate, the facility owners — will deliver educational seminars to individual companies where the BCGGA and the company agree the seminar is an appropriate tool. Where the company demonstrates appropriate levels of safety, this education seminar may act to avoid an elevated enforcement action such as an administration penalty or prosecution.

6-3 INCENTIVES

PRACTICE STATEMENT: Damage prevention programs include incentives to promote compliance with laws and regulations.

PRACTICE DESCRIPTION: These programs have the endorsement of all stakeholders and members of the BCCGA. Non-members are also encouraged to promote the programs in the spirit of diligence and safety.

Ground disturber focused incentives can include, but are not limited to, the following:

- Ease of access to BC One Call
- One Call membership and participation considerations
- Representation on BC One Call
- Safety and liability protection
- Reasonable enforcement of regulations
- Preferred access to contract designers and contractors for bidding
- Preferred access to contract bidding, and
- Insurance benefits

In greater detail, these incentives will lead to the following outcomes:

Safety and Liability	Demonstrated adherence to the best practices will provide increased safety and liability protection for all industry members.
Recognition Program	The BCCGA will recognize compliance related improvements among excavating firms at its annual symposium. The media attention will also add to the recognition.
Preferred Access to Contract Bidding	This preferred access is to provide incentives to ground disturbers that demonstrate compliance to best practices. It is recommended municipalities and those who hire excavation contractors are to structure their contract awarding process to accomplish compliance.

Insurance Benefits

To provide incentives to follow best practices, it is recommended construction insurance companies in the province develop a system that allows them to provide financial incentives for companies with a demonstrated, defensible, formalized, and documented safety-related education process.

Reasonable Enforcement of Regulations

Reasonable enforcement of regulations refers to actions by enforcement authority officials and enforcement processes. These actions aim to arrive at fair 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.

Preferred Access to Design and Administration Consultants

To provide incentive to consultants who demonstrate compliance to Best Practices, it is recommended that Municipalities and others who employ design and administration consultants ensure they build a process into their contract awarding process which accomplishes this. This process may include such items as:

- Appropriate use of SUE
- Appropriate use of pre-engineering process encompassing notification of utilities, drawing circulation and tender document inclusions
- Vetting contractors through a preferred access process
- Inclusion of appropriate contract language that recognizes the ORCGA's Best Practices and requests compliance

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

Cost Benefits

Best Practices are always thought to be the best alternative and as such have an inherent cost benefit

REFERENCE: The regulatory agencies, British Columbia Safety Authority and WorkSafeBC, have agreed to apply reasonable enforcement of regulations as stipulated.

6-4 PENALTIES

PRACTICE STATEMENT: Compliance programs include penalties for violations of the damage prevention laws or regulations.

PRACTICE DESCRIPTION: There are specific provisions within the context of the regulations for penalties for failure to comply with the damage prevention laws and regulations. There is a penalty system that will include enforcement education as an alternative or supplement to other penalties. This penalty system also has a tiered structure to account for the level of severity or repeat offenses (e.g., Legal Orders, Tickets, and Administrative Penalties). Violations could entail actual infrastructure damage as well as near-miss situations. The BCCGA should assess and integrate the key learnings from these analyses into its public awareness and education programs. The penalty system, however, 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).

REFERENCE: Regulation 20.79 (WorkSafeBC), Safety Standards Act and Gas Safety Regulation (British Columbia Safety Authority)

6-5 ENFORCEMENT BY EXISTING AUTHORITY

PRACTICE STATEMENT: Statutes specify an authority body and gives it the resources to enforce the law.

PRACTICE DESCRIPTION: Enforcement authorities have the resources to enforce the damage prevention laws and regulations. Experience has shown enforcement of laws and regulations that did not identify a specific authority have not been effective. An authority of such has the following characteristics:

- A process for receiving reports of violations from any stakeholder
- An operating budget source other than revenue from fines, 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

REFERENCE: BC Safety Authority, Oil and Gas Commission, and WorkSafeBC are examples of organizations with all the noted characteristics above.

6-6 STRUCTURED REVIEW PROCESS

PRACTICE 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 first tier (informal) hearings
- Possible outcomes of first tier hearings, and
- Appeal rights following a second tier (formal) hearing

7-0
PUBLIC EDUCATION
PRACTICE STATEMENTS AND DESCRIPTIONS

British Columbia
BCCGA
Common Ground Alliance

7-0

PUBLIC EDUCATION

7-1 KNOW THE AUDIENCE AND THEIR NEEDS

PRACTICE STATEMENT: An effective damage prevention education program includes identification of target audiences and their individual needs. The target audience must be identified in order to effectively educate about damage prevention and influence damage prevention habits. It is necessary to establish the training needs of the audience and to tailor a communications package to those training needs.

PRACTICE DESCRIPTION: The fundamental reason for conducting education and public awareness campaigns is to change behaviour.

An extensive and diverse group of individuals and organizations stand to benefit from damage prevention training. It then becomes necessary to identify who needs to receive the training and awareness information. The following steps may prove useful in determining that need:

- Examine the major problem areas
- Determine if there are any historical trends in damage related information
- Categorize incidents by (1) frequency of occurrence, and (2) severity of occurrence, and
- Rank and prioritize incidents to identify which target audience needs to receive training

Setting a goal that depicts the outcome of the training as part of developing the training information can be beneficial. Consider the following tips:

- Clearly outline and define the problem areas. Identify any components, directly or indirectly, that have not been working satisfactorily.
- Establish what is needed to prevent further problems. For example, what roles, responsibilities, or behaviours need to be changed?
- Decide on which new behaviours need to come into effect. What must take place in order to correct or change the current problem situation?
- Ensure to identify and reinforce the mutual benefits of a behaviour change.

Education and promotional materials need to be as effective as possible. Try to structure all crucial messages in a compelling, interesting, and memorable way. To fully connect with the audience, consider these common presentation features:

- Timing of the event, as some audiences are more alert or prefer morning sessions as opposed to other times of the day or evening
- A complimentary meal in conjunction with the education session adds to the social or networking aspect of the event
- Guest speakers help grab the attention of the audience
- Visuals, such as videos, are effective education tools
- A well-packaged presentation is effective at contractor and trade shows, and
- Use of a variety of mediums is effective in training presentations (combine visuals, hands-on, and interactive methods)

7-2 DEVELOP AND USE A MARKETING PLAN

PRACTICE STATEMENT: Develop a marketing plan that will take into account the training needs of the targeted audience, available resources, communications media outlets, and timeframes.

PRACTICE DESCRIPTION: A marketing plan enables better implementation, control and continuity of advertising and promotional strategies, and ensures the most effective and efficient use of 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

PRACTICE STATEMENT: Use good project management practices 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 outlines:

- 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, and
- How the awareness campaign or project should be done

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

7-4 CREATE A DAMAGE PREVENTION MESSAGE THAT "STICKS"

PRACTICE STATEMENT: When promoting damage prevention, create a message that will "stick."

PRACTICE DESCRIPTION: Create a message that is memorable by using creative material, such as visuals, props, and sound clips. Deliver the message in a unique venue or setting with an engaging presenter.

The message should incite action. The objective is to put new behaviours into practice quickly and easily. The message should "stick" with the audience long after leaving the session.

7-5 PROMOTE THE DAMAGE PREVENTION MESSAGE

PRACTICE STATEMENT: Promote the damage prevention message by finding creative ways to persuade the target audience to a) listen attentively to the message, b) retain the message, and c) alter behaviour because of the message.

PRACTICE DESCRIPTION: A solid advertising campaign can be effective at securing the attention of a broader audience. 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 (based on specific geographical area, market sector, or demographics). Other examples of media 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 sources, such as public service

announcements made by newspaper, radio, or television. Partnering websites and social media are other advertising channels to promote damage prevention.

Multiple stakeholders with similar goals and messages can partner together to reduce costs and maximize impact.

Free items given to participants at 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 the home or office.

CURRENT PRACTICE: Direct mail 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 on their properties.

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. to 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 post a "call before you dig" message on their vehicles, which takes advantage of the free damage prevention advertising from the circulation of the vehicles.

7-6 ESTABLISH STRATEGIC RELATIONSHIPS

PRACTICE STATEMENT: Establish and nurture strategic working relationships to assist in the promotion of damage prevention. Since some promotion activities can be expensive, partnering with other stakeholders can reduce costs.

PRACTICE DESCRIPTION: Strategic relationships can be nurtured with others who have shared or similar issues, interests, and needs. Relations could include industry associations, equipment manufacturers, and trade groups. Stakeholders at a distance, which may include government agencies,

emergency responders, and media outlets, are also important for promoting damage prevention.

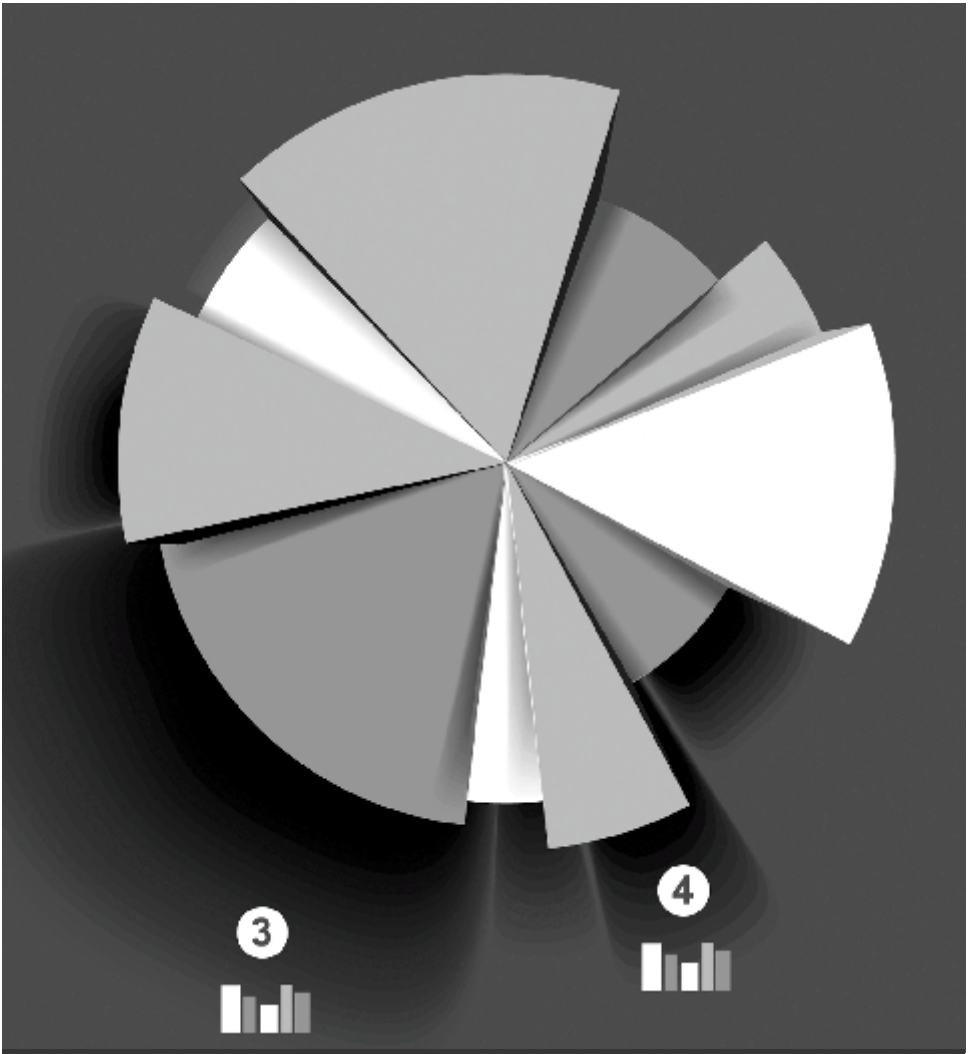
7-7 MEASURE RESULTS AND USE THEM TO IMPROVE

PRACTICE STATEMENT: Critically review the results and outcomes of the various initiatives. The purpose of a review is to determine successes and failures, followed by continuous program improvement to implement any lessons learned.

PRACTICE DESCRIPTION: A review of the marketing plan assists in establishing the framework for future plans. The review can entail the following practices:

- Gauge audience response to structured training, familiarization and awareness initiatives
- Survey recipients (via direct mail, telephone, etc.) to determine if behaviours have changed, and to what extent
- Quantify the change in behaviour by reviewing damage statistics and identifying if event, frequency, and cost impacts have changed, and
- Identify and address the gaps in the damage prevention program to establish a practice of continuous improvement

Aspects of the marketing plan that are effective can be enhanced and further utilized. As well, aspects that are less effective can be improved or abandoned. Furthermore, additional training needs can be established.



8-0
REPORTING & EVALUATION

PRACTICE STANDARDS AND DESCRIPTIONS

British Columbia
BCCGA
Common Ground Alliance

8-0

REPORTING & EVALUATION

8-1 REPORTING INFORMATION

PRACTICE STATEMENT: All stakeholders have the opportunity to report information. Damage Information Reporting Tool (DIRT) is the preferred method of choice.

PRACTICE DESCRIPTION: Facility owners/operators, locators, ground disturbers, and other appropriate stakeholders can report qualified information on an incident that led to, or could have led to, damage to an underground facility.

8-2 STANDARDIZED INFORMATION

PRACTICE STATEMENT: It is essential to report standardized information.

PRACTICE DESCRIPTION: The requested data is standardized and consists of essential information. An analysis of this information should determine the events that led to, or could lead to, a damaged facility. As such, the collected data may include information on the damage, downtime of the facility, and incidents that were near-misses.

8-3 NON-COMPLIANT STAKEHOLDER

PRACTICE STATEMENT: The non-compliant stakeholder group is identified.

PRACTICE DESCRIPTION: It is important to identify any stakeholder group that is non-compliant. This group can be targeted for education and training in order to ensure compliance.

8-4 ACCURACY OF INFORMATION

PRACTICE STATEMENT: The person that does the reporting provides detailed information.

PRACTICE DESCRIPTION: If all of the requested data is not available, the person who is reporting the information provides the most complete information as possible.

8-5 CHANGES IN REPORTING FORMAT

PRACTICE STATEMENT: The requested information may change.

PRACTICE DESCRIPTION: It is possible that the necessary additional or different data for the evaluation process may change the requested information. In this case, it may be necessary to revise the report to adapt to the changes in the regulations or statutes, the evolution of industry technology, and the awareness of root causes as needed.

8-6 SIMPLE PROCESS FOR COLLECTING DATA

PRACTICE STATEMENT: A simple one-page form for collecting data is adopted..

PRACTICE DESCRIPTION: If possible, limit the reporting form to a simple single page. This form should contain a list of standardized questions. Facility owners/operators, locators, ground disturbers, and other appropriate stakeholders will adopt or develop this list of questions. On the form, limiting the number of hand-written responses required makes it easier to answer the questions. As well, using check boxes or other simple answering techniques will help the person filing a report and make the evaluation process much simpler.

All anonymous data collected will be uploaded for geographical and general assessment & analysis.

A sample Damage Information Reporting Tool data collection form can be found in appendix C.

8-7 TRAINING PROCESS FOR COLLECTING DATA

PRACTICE STATEMENT: Training for collecting data is provided.

PRACTICE DESCRIPTION: There will be training available on how to complete and submit the data.

8-8 COMMON DATABASE IN PLACE

PRACTICE STATEMENT: An organization is identified to receive the data.

PRACTICE DESCRIPTION: A common database is in place and maintained. The Common Ground Alliance's Damage Information Reporting Tool (DIRT) is the currently recommended database used.

8-9 DATA EVALUATION PROCESS

PRACTICE STATEMENT: An independent committee evaluates the data.

PRACTICE DESCRIPTION: An independent committee, with representation from all interested stakeholders, provides assistance in evaluating of the data.

8-10 PURPOSE OF DATA COLLECTION

PRACTICE STATEMENT: Data collection is to improve damage prevention efforts and to raise awareness of underground damage.

PRACTICE DESCRIPTION: The purpose of data collection is to assess and improve underground damage prevention efforts. It is not to be used to penalize nor punish. Instead, it is for the purpose of raising 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 and made available to all industry stakeholders.

8-12 ROOT CAUSE

PRACTICE STATEMENT: Root causes are identified.

PRACTICE DESCRIPTION: It is important to identify the root causes of damages including near-misses of damages.

8-13 QUANTIFYING RESULTS

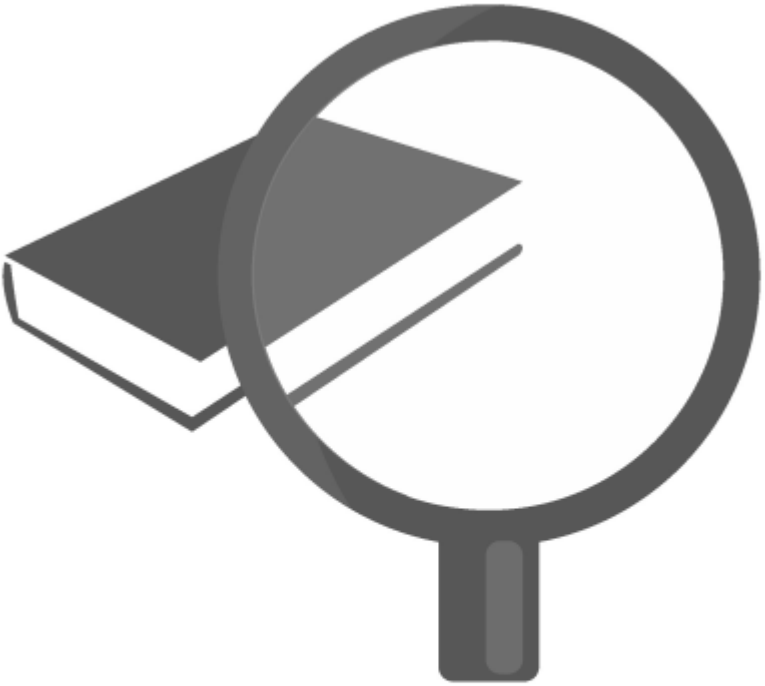
PRACTICE STATEMENT: Results are quantified against a standardized risk factor.

PRACTICE DESCRIPTION: Results are quantified against a standardized risk factor. This risk factor considers how much exposure to potential damage a stakeholder has. Factors such as the number of kilometres of line installed or the number of one-call notification tickets may determine the amount of risk involved. For example, a risk factor may compare how many times damage to underground facilities has occurred in a certain period of time versus the total number of 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 BCCGA or other similar Common Ground Alliance affiliated organizations. Upon these assessments, the Best Practices committee will make recommendations to address the trends and the Education Committee will set up programs to convey the messages.



Glossary

British Columbia
BCCGA
Common Ground Alliance

GLOSSARY

ABANDONED LINE OR FACILITY: An abandoned line or facility is any underground or submerged line or facility that is no longer in use.

ALTERNATIVE DISPUTE RESOLUTION (ADR): A process or procedure other than litigation that disputing parties use to agree upon in order to resolve a dispute. The parties mutually agree on whether the resolution will be binding or not. ADR includes, but may not be limited to, an advisory board, arbitration, mini-trial, mediation, partnering, and standing neutral.

ALTERNATE LOCATE AGREEMENT (ALA): A contractual agreement between a facility owner and a ground disturber that allows the ground disturber to proceed with excavation work without receiving a traditional field locate.

ATTRIBUTE: An attribute is a characteristic that helps to describe the data.

AS-BUILT DRAWING: An as-built drawing is a detailed depiction of a facility as it is installed in the field.

BACKFILL: Backfill is a process of filling the void or hole as created by the excavation.

BUSINESS DAY: A business day is any day of the week except for Saturday, Sunday, and statutory provincial and federal holiday.

CATHODIC PROTECTION: Cathodic protection is a process to prevent or stop corrosion on a buried or submerged structure by means of electrically reversing the natural chemical reaction. Some methods include, but are not limited to, installation of a sacrificial anode bed, use of a rectifier based system, or any combination of these methods with or without other similar systems. The process involves installing wiring between the buried or submerged structure and all anodes and rectifiers. Wiring is also installed to test the stations that measure the effectiveness of the cathodic protection system.

CEC: Commission for Environmental Cooperation.

COMPLIANCE: Compliance is the process of adhering to applicable codes and regulations.

CRTC: Canadian Radio-television & Telecommunication Commission.

CSA: Canadian Standards Association.

DAMAGE: Damage is any impact or exposure to an underground facility that consequently requires repairs. Circumstances such as a weakening in the facility or the destruction (partial or complete) of the facility may have led to the damage in the areas that include, but is not limited to, the protective coating, lateral support, cathodic protection, or the housing for any of the line, facility, or device.

DAMAGE INFORMATION REPORTING TOOL (DIRT): This tool is a secure web application for collecting and reporting underground damage information. This system allows a user to do any of the following actions: submit damage and near miss reports; browse the files submitted by his or her organization; administer role-based company and user information; edit personal profiles; change or retrieve password; and submit feedback and questions.

DAMAGE REPORTING: This process is the immediate reporting to the one-call centre and facility owner/operator upon the discovery or occurrence of any damage during the course of an excavation or demolition work. Damage reporting also includes alerting the occupants of the premises of any emergency that may have been created or discovered nearby. If necessary, this involves the contacting of first responders as quickly as practicably as possible.

DAYLIGHTING: This process is the uncovering and exposing of underground utilities and pipelines using hydroexcavation.

DEMARCATION POINT: The demarcation point (DM) is the point at which the facility owner no longer has ownership of a distribution system, including connection assets. Privately owned infrastructure may continue from this point onward if the system is not owned by or known to the facility owner.

DEMOLITION WORK: Demolition work is the partial or complete destruction, by any means, of a structure that is provided service by, or is adjacent to, an underground line or facility.

DESIGNER: A designer is an architect, engineer, or other person who prepares or issues a drawing or blueprint for a construction or other project that requires excavation or demolition work.

ELECTRONIC/DIGITAL MAPPING DATA: Electronic/Digital mapping data is geospatial data that is in a format a computer system can recognize.

EMERGENCY: With reference to underground facilities, an emergency is an unforeseen event or occurrence that involves a clear and imminent danger to life, health, or property. It also means the interruption of essential utility services or the blockage of transportation facilities that require immediate action.

EMERGENCY NOTICE: An emergency notice is a communication for the need to excavate immediately. This need may be due to a sudden or unforeseen occurrence, or national emergency that involves a clear and imminent danger to life, health, environment, or property. The one-call centre receives the communication in order to alert the underground facility owner and operator involved.

EMERGENCY RESPONSE: An emergency response is an action taken by a facility owner or operator to an emergency notice.

EXCAVATE OR EXCAVATION: Excavate or excavation is the movement of earth, rock, or other material below the existing grade. Such an operation may involve the use of explosives, or mechanical or non-mechanical equipment. This activity includes, but is not limited to, auguring, blasting, boring, digging, ditching, dredging, drilling, driving-in, grading, plowing-in, pulling-up, ripping, scraping, trenching, and tunnelling.

FACILITY OWNER OR OPERATOR: This refers to any entity (person, utility, municipality, authority, political subdivision, and so on) that owns, runs, or controls the operation of an underground facility.

FACILITY: A facility is an underground or submerged conductor, pipe, or structure that is used to provide service, such as electric or communications. A facility includes, but is not limited to, traffic control loops and similar underground or submerged devices. A facility is also an underground or submerged pipe (including any appendages and accessories) that is to carry, provide, or gather gas, oil or oil products, sewage, storm drainage, water, or other liquid service (including, but is not limited to, irrigation systems).

GEOSPATIAL DATA: Geospatial data is information that identifies and relates the geographical location (in terms of latitude and longitude). The data also identifies the characteristics of natural or constructed features and the boundaries on the earth. Geospatial data includes facility location information and notification areas.

GEOGRAPHIC INFORMATION SYSTEM (GIS): This system consists of an organized collection of computer hardware, software, and geographic data used to capture, store, update, maintain, analyze, and display all forms of geographically referenced information. Key components of a GIS are an integrated computer system, user, and geospatial data.

GLOBAL POSITIONING SYSTEM (GPS): This system consists of using a number of satellites to provide the precise position, velocity, and time information to users anywhere on the planet. Through a process called triangulation, a GPS receiver is able to determine location information by collecting signals from three or more satellites. These hand-held receivers can be accurate within 100 metres of a true position. Most sophisticated receivers can provide sub-meter accuracy.

GRADE (NOUN): The surface elevation.

GRADE (VERB): The act of changing the surface elevation.

GROUND DISTURBANCE: This term refers to any work, operation, or activity on or under the existing surface that results in a disturbance or displacement of the soil or ground cover. The disturbance may include but is not limited to the following activities: digging; excavation; trenching; vertical drilling; topsoil stripping; land levelling; tree planting; subsoil aeration; mechanical rock picking; rutting and driving fence posts; bars; rods; pins; or anchors.

GROUND DISTURBER: A ground disturber is the person who proposes or engages in an excavation or demolition work, either for him or herself, or for another person.

GROUND PENETRATING RADAR (GPR): GPR is a geophysical method that uses radar pulses to create a three-dimensional view of underground materials.

GROUNDING SYSTEM: This system consists of one or more ground conductors or ground rods that provides a low resistance path to earth ground potential through a mechanical connection to structures, conductors, and equipment.

HYDROEXCAVATION: Hydroexcavation is a non-invasive means of extracting soil through a vacuum while using water or air jet devices for breaking ground.

LAND BASE: Land base is electronic mapping data that depicts earth surface features and is tied to real-world geographic coordinates, such as latitude and longitude.

LATITUDE: Latitude is a coordinate that refers to the distance measured north or south of the equator.

LINE: Line has the same connotation as facility.

LOCATE (VERB): The action of an underground plant owner/operator (or its agent) of providing information to a ground disturber enabling for the determination of the location of a facility.

LOCATE (NOUN): The provision of location information by an underground facility owner (or its 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/REPORT: A locate form is the accompanying documentation on a locate that 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 locate request is the process of communications between a ground disturber and a one-call centre to fulfill the request to locate an underground facility.

LOCATE TICKET: A document for a locate request created by a one-call organization or a plant owner or their target agent marked with a unique identification number.

LONGITUDE: Longitude is a coordinate that refers to the distance measured east and west of the meridian line (Greenwich).

MARKING STANDARDS: Marking standards are the methods as per the guidelines of the American Public Works Association that a facility owner or operator uses to indicate the existence of a line or facility.

MEMBER DATABASE: A member database is a structured collection of data or information defined for a specific use, user, system, or program. The format of the database may be hierarchical, network, relational, semantic, or sequential in nature.

MEMBERSHIP: Membership refers to a person or group that voluntarily participates in a one-call notification centre because the person or group has an interest in the protection of lines or facilities, or a statutory responsibility to protect lines or facilities.

NOTICE: A notice is the timely communication that a ground disturber or designer gives in order to alert the one-call centre that a facility owner or operator intends to excavate.

NOTIFICATION AREA: The notification area is the geographic limits of coverage where a facility owner/operator has facilities and wishes notification of excavation activities.

NOTIFICATION PERIOD: The notification period is the amount of time that begins when the notice is given and that ends when the work to excavate may start.

ONE-CALL NOTIFICATION CENTRE: A one-call centre is an entity that administers a system through which a person can make a single phone call, send a fax, or use other forms of communications for the purpose of notifying facility owners/operators that there are proposed excavations.

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

PRACTICABLE: Practicable is where possible in practice having due regard to limiting circumstances.

PLANNING: The process of planning is a phase at the beginning of a project where information is gathered and decisions are made. This phase may be in regards to the route or location of a proposed excavation based on constraints. Such constraints could include the locations of existing facilities, potential conflicts, and the relative costs of relocating existing facilities or more expensive construction for the proposed facility.
a facility is located, and in which it is necessary to take special care.

PLAT: A plat is a map or representation on paper that outlines the subdividing of a piece of land into lots, streets, alleys, and so forth.

POSITIVE RESPONSE: A positive response is a communication with a ground disturber that takes place prior to excavation. This action is to ensure all contacted facility owners/operators (typically via the one-call centre) have located their underground facilities and have appropriately marked any potential conflicts within the areas of planned excavation.

PRE-MARKING OR POSITIVE SITE IDENTIFICATION: These are markings used in accordance with the American Public Works Association guidelines to identify the proposed excavation site or work area.

SUBSURFACE UTILITY ENGINEERING (SUE): This term refers to an engineering process for accurately identifying the quality of the underground utility information needed for excavation plans and for acquiring and managing that level of information during the development of a project.

SURVEY INFRASTRUCTURE: Survey infrastructure refers to property boundary monuments and control survey monuments.

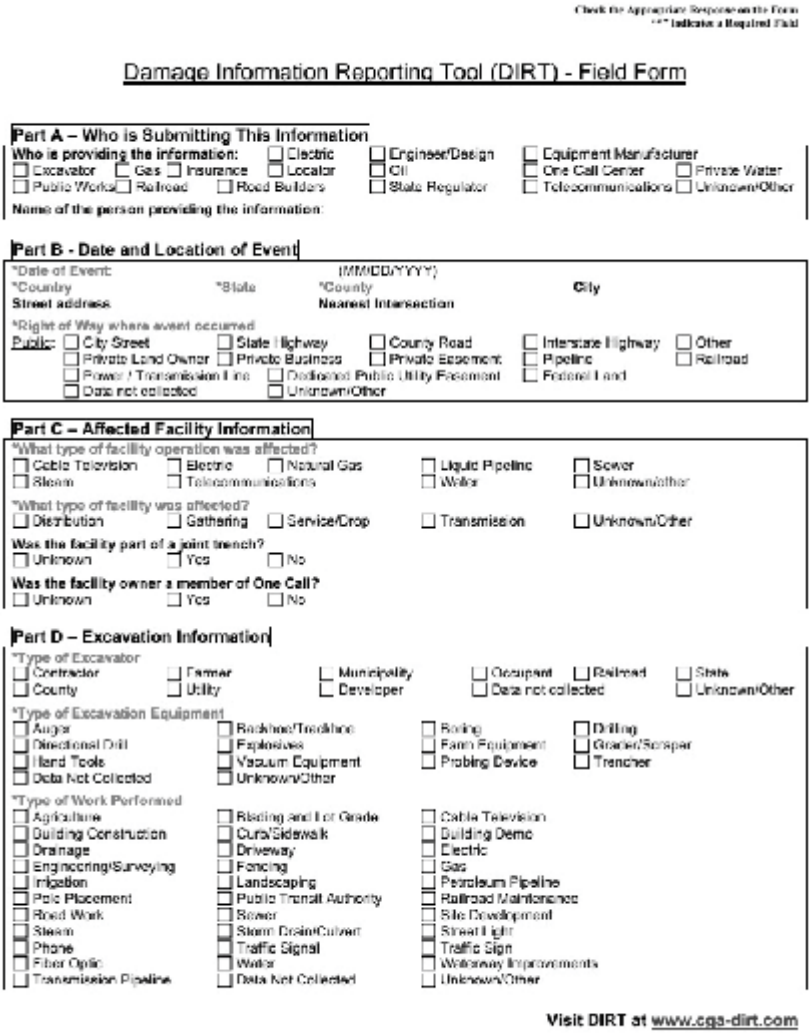
TEST HOLES: The process of test holes is a means of exposing a facility by using a safe method or practice (non-destructive) to determine the precise horizontal and vertical position of an underground line or facility.

TOLERANCE ZONE: Tolerance zone is the space in which a facility is located, and in which it is necessary to take special care.

APPENDIX B: UNIFORM COLOUR CODE

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

APPENDIX C: DIRT REPORTING FORM



Check the Appropriate Response to Form
"*" Indicates a Required Field

Damage Information Reporting Tool (DIRT) - Field Form

Part A – Who is Submitting This Information

Who is providing the information: ☐ Electric ☐ Engineer/Design ☐ Equipment Manufacturer
☐ Excavator ☐ Gas ☐ Insurance ☐ Locator ☐ Oil ☐ One Call Center ☐ Private Water
☐ Public Works ☐ Railroad ☐ Road Builders ☐ State Regulator ☐ Telecommunications ☐ Unknown/Other

Name of the person providing the information:

Part B - Date and Location of Event

*Date of Event: (MM/DD/YYYY)
*Country *State *County City
Street address: Nearest Intersection:

*Right of Way where event occurred
Public: ☐ City Street ☐ State Highway ☐ County Road ☐ Interstate Highway ☐ Other
☐ Private Land Owner ☐ Private Business ☐ Private Easement ☐ Pipeline ☐ Railroad
☐ Power / Transmission Line ☐ Dedicated Public Utility Easement ☐ Federal Land
☐ Data not collected ☐ Unknown/Other

Part C – Affected Facility Information

*What type of facility operation was affected?
☐ Cable Television ☐ Electric ☐ Natural Gas ☐ Liquid Pipeline ☐ Sewer
☐ Steam ☐ Telecommunications ☐ Water ☐ Unknown/other

*What type of facility was affected?
☐ Distribution ☐ Gathering ☐ Service/Drop ☐ Transmission ☐ Unknown/Other

Was the facility part of a joint trench?
☐ Unknown ☐ Yes ☐ No

Was the facility owner a member of One Call?
☐ Unknown ☐ Yes ☐ No

Part D – Excavation Information

*Type of Excavator
☐ Contractor ☐ Farmer ☐ Municipality ☐ Occupant ☐ Railroad ☐ State
☐ County ☐ Utility ☐ Developer ☐ Data not collected ☐ Unknown/Other

*Type of Excavation Equipment
☐ Auger ☐ Backhoe/Trackhoe ☐ Boring ☐ Drilling
☐ Directional Drill ☐ Explosives ☐ Farm Equipment ☐ Grader/Scraper
☐ Hand Tools ☐ Vacuum Equipment ☐ Probing Device ☐ Trencher
☐ Data Not Collected ☐ Unknown/Other

*Type of Work Performed
☐ Agriculture ☐ Blasting and Bar Grade ☐ Cable Television
☐ Building Construction ☐ Curb/Sidewalk ☐ Building Demo
☐ Drainage ☐ Driveway ☐ Electric
☐ Engineering/Surveying ☐ Fencing ☐ Gas
☐ Irrigation ☐ Landscaping ☐ Petroleum Pipeline
☐ Pole Placement ☐ Public Transit Authority ☐ Railroad Maintenance
☐ Road Work ☐ Sewer ☐ Site Development
☐ Steam ☐ Storm Drain/Culvert ☐ Street Light
☐ Phone ☐ Traffic Signal ☐ Traffic Sign
☐ Fiber Optic ☐ Water ☐ Waterway Improvements
☐ Transmission Pipeline ☐ Data Not Collected ☐ Unknown/Other

Visit DIRT at www.cga-dirt.com

Check the Appropriate Response on the Form
"*" Indicates a Required Field

Part E&F – Notification, Locating and Marking

*Did the excavator notify the one call notification center?
☐ Yes ☐ No
If Yes which One Call center
If Yes, please provide the One Call ticket number

*Type of Locator
☐ Utility Owner ☐ Contract Locator ☐ Data Not Collected ☐ Unknown/other

*Were facility marks visible in the area of excavation?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/other

*Were facilities marked correctly?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/other

Part G – Excavator Downtime

Did Excavator incur down time?
☐ Yes ☐ No

If yes, how much time?
☐ Unknown ☐ Less than 1 hour ☐ 1 to 2 hours ☐ 2 to 3 hours ☐ More than 3 hours Exact Value _____

Estimated cost of down time?
☐ Unknown ☐ $0 to 5000 ☐ $5000 to 25,000 ☐ $25,000 to 50,000 ☐ Over $50,000 Exact Value _____

Part H – Description of Damage

*Was there damage to a facility?
☐ Yes ☐ No (i.e. near miss)

*Did the damage cause an interruption in service?
☐ Yes ☐ No

If yes, duration of interruption
☐ Data Not Collected ☐ Less than 1 hour ☐ 1 to 2 hrs ☐ 2 to 4 hrs ☐ 4 to 8 hrs ☐ 8 to 12 hrs ☐ 12 to 24
☐ 1 to 7 days ☐ 2 to 3 days ☐ more than 3 days ☐ Unknown Exact Value _____

Approximately how many customers were affected?
☐ Zero ☐ One ☐ 2 to 10 ☐ 10 to 50 ☐ 50 or more ☐ Unknown Exact Value _____

Estimated cost of repair/restoration
☐ $ 0 to 5,000 ☐ $5,000 to 25,000 ☐ $25,000 to 50,000 ☐ $50,000 or more ☐ Unknown Exact Value _____

Number of people injured
☐ Unknown ☐ Zero ☐ One ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____

Number of fatalities
☐ Unknown ☐ Zero ☐ One ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____

Part I – Description of the Root Cause

*Please choose one

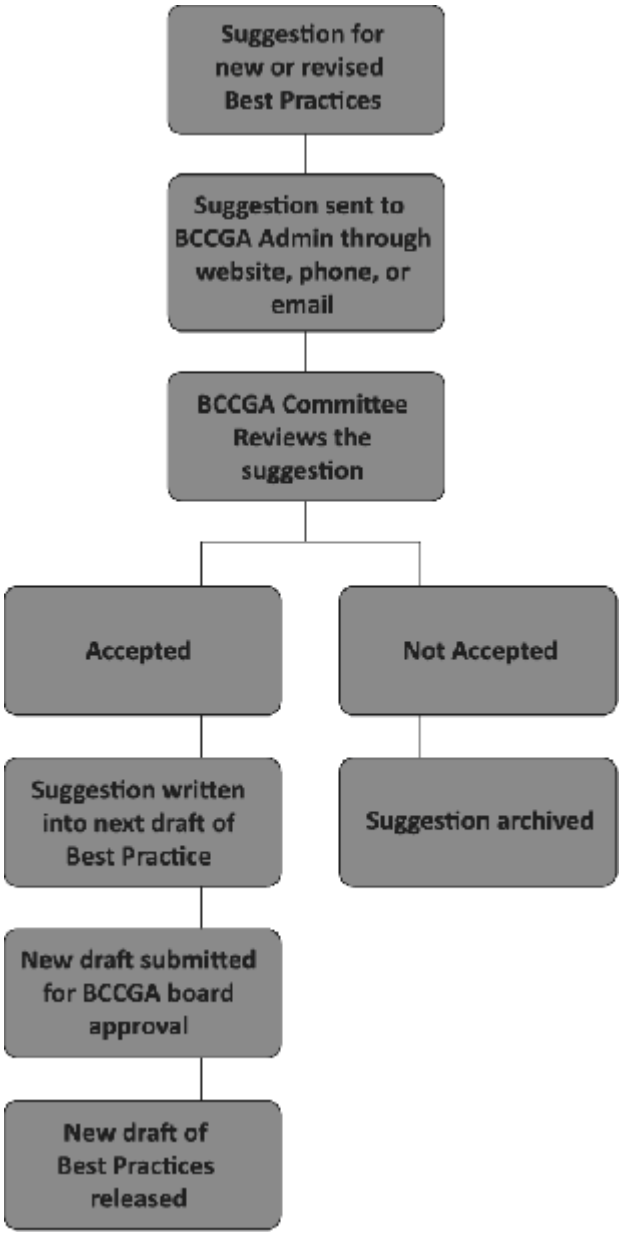
☐ Facility was not located or marked
☐ One call notification center error
☐ Facility could not be found or located
☐ Incorrect facility records/maps
☐ Deteriorated facility
☐ Excavation practices not sufficient
☐ None of the above. Please Explain
☐ Facility marking or location not sufficient
☐ No notification made to the one call center
☐ Abandoned facility
☐ Wrong information provided
☐ Notification to one call center, made but not sufficient
☐ Previous damage ☐ Data Not Collected

Part J – Additional Comments

APPENDIX D: OTHER REFERENCES

- The Oil and Gas Activities Act
- National Energy Board Act
- National Energy Board - Regulatory Document Index
- WorkSafe BC - Occupational Health and Safety Regulations
- WorkSafe BC - Workers Compensation Act
- WorkSafe BC - WCB Standards
- British Columbia Safety Authority - Safety Standards Act and Gas Safety Regulation

APPENDIX E: SUGGESTING A NEW OR REVISED BEST PRACTICE



British Columbia Common Ground Alliance
Best Practices Version 2.0

British Columbia has thousands of kilometres of pipelines, communication and electrical lines, water, sewer, and other underground facilities buried beneath its surface. Whether you are an excavator, contractor, facility owner/operator, or locator, everyone needs to be responsible for preventing the damage to these facilities. It became necessary for those with an interest in protecting underground infrastructure to work together to develop safe and consistent practices.

The British Columbia Common Ground Alliance, with the guidance of its partners and the consensus and commitment of its stakeholders, developed and published its first version of best practices to serve as an educational and reference tool. These best practices cover the type of activities that the BCCGA believes organizations will follow at an optimum level in order to prevent damage to the province's underground infrastructure. We must remember, however, that with more learning and advanced technology, these best practices will evolve further.

The BCCGA is a unique consensus-driven organization with a direct conduit to regulatory innovation. It works to offer practical tools and to foster an environment in which anyone who is a resident or conducting business in British Columbia is aware of and compliant of its best practices.

1-800-995-8823

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British Columbia
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Thank you to our valued partners!

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CLAC
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