

# **CITY OF SURREY**

## **Excavation Safe Work Practices And Site Preparation**



**JULY 2010**

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**BE SMART  
WORK SAFE**

**“Safety is everybody’s business”**

*This is a living document and ongoing improvements will be made to improve the health & safety of all employees, volunteers and contractors.*

Updated document will be posted as revised on the City of Surrey intranet under Health & Safety.

This document does not replace the Workers’ Compensation Act or WorkSafeBC OH&S regulation.

This document is designed to complement the City of Surrey Health & Safety program Handbook.

**For information on:**

**City Occupational Health & Safety programs, safety issues and questions**

**Call:  
Sam Chauhan  
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604-591-4658  
778-846-0673**

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### WORKSAFEBC OHS - SLOPING & BENCHING REQUIREMENTS IN LIEU OF SHORING

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# Excavation

## Safe Work Practices And Site Preparation

### **PURPOSE**

Excavation and trenching are among the most hazardous work undertaken by the City of Surrey. This document outlines general requirements and specific safe work practices to ensure the health and safety of employees who work in or around excavations as part of their job duties. These safe work practices are also designed to protect the general public who work or travel in the vicinity of excavations.

### **OBJECTIVE**

A Construction Safety Checklist Form must be completed and communicated to all workers prior to the start of any excavation for the purpose of an infrastructure installation or repair. At the job site, workers must review the information on the Form, assess the job site for any hazards that may not have been identified and sign the Form once they are satisfied the information is correct.

Before a worker enters any excavation over 1.2 m (4 ft) in depth or, while in the excavation, a worker approaches closer to the side or bank than a distance equal to the depth of the excavation, the sides of excavation must be sloped, benched, shored or supported in accordance with Part 20 of the WCB Occupational Health & Safety Regulation or with the specifications and requirements of a registered professional engineer.

### **HAZARDS**

Hazards that workers may be exposed to when excavating around underground utilities include:

- Electrocutation
- Explosive, flammable, combustible gases or fluids
- Toxic gases & vapours
- Drowning
- Cave-ins
- Contaminated soils (PCB's may be present in coal-tar coating around natural gas pipelines)
- Moving heavy equipment/machinery around excavations
- Vehicular traffic
- Silica / Asbestos

### **SUPERVISION**

Site Supervisors (ie. Foreman/Chargehand/Trades Improver) shall be familiar with the actual and potential hazards associated with this work. Site Supervisors must ensure that workers under their direction and control are aware of the dangers associated with the work and perform their work in a safe manner. Site Supervisors shall ensure the requirements of this procedure, related elements of the Occupational health & Safety regulation, and applicable industry best practices are applied at all times. Site Supervisors must hold a pre-job meeting with the crew to discuss the hazards and control measures for the work to be done. Site Supervisors are responsible to ensure the workers under their direction and control sign-off the site preparation form under the communication section prior to the commencement of the work.

## WORKER RESPONSIBILITY

Each employee is responsible to carry out their work in accordance with the established safe excavation practices outlined in this document. Employees must also use and or wear protective equipment, devices and clothing as required for the hazards of the work. It is every employee's responsibility to ask questions about anything they do not understand or safe work procedures that are not clear.

If any worker believes that there is a risk of injury to themselves, a co-worker or damage to a utility or piece of equipment, it is their duty to stop work immediately and correct the situation including contacting their supervisor to determine the next course of action. Workers must sign-off the site preparation form under the communication section prior to the commencement of the work.

## EXCAVATION SAFE WORK RULES

1. Before excavating or drilling with powered tools and equipment, the location of all underground utilities in the area must be accurately determined; mark location on asphalt to identify location of underground utilities and any danger to workers from the utility must be controlled. (see page 6 ).  
Call BC One Call to:
  - Tell you which members may have underground facilities in the proposed excavation area
  - Transmit the information about the proposed activity to the member companies
  - Inform you about your liability and provide you with a ticket number to confirm your request
  - Advise you to contact any other parties who may have underground facilities in the excavation area, as all facility owners are not members of BC ONE CALL. You must contact these non members directly.

Each member company will then contact you with information about where their facilities are buried in the proposed excavation area. **Always wait for a response from all facility owners in the proposed excavation site before digging.** Give the utility a **minimum of three full working days'** notice for planned work.

2. Mechanical digging is not permitted within the "no mechanical dig zone boundary limit" (1m (3ft. 3in.) in any direction from the utility or its marked location) until it is exposed by hand digging or hydro-excavating at a sufficient number of locations to determine its exact positions and depths. Once the utility or service is adequately exposed, mechanical digging is permitted up to 0.3m (12in.) of the utility.
3. Pointed tools must not be used for probing to locate underground gas lines or electrical utilities.
4. Traffic around the site must be controlled, and barricades, signs, and/or flag persons used as needed to control both vehicular and pedestrian traffic.
5. Excavated material must be kept back a minimum distance of 0.6 m.(2 feet) from the edge of a trench excavation and 1.22 m (4 feet) from any other excavation. Excavated material must not be piled so it endangers workers.
6. The sides of an excavation must be scaled and trimmed or otherwise stabilized to prevent slides of material or falls of rock which could endanger workers.
7. Trees, utility poles, rocks or similar objects adjacent to an area to be excavated must be removed or secured if they could endanger workers.

8. Safe access must be provided in the immediate area where workers are employed in trenches over 1.22 m (4 ft deep). Ladders must extend from the bottom of the excavation to at least 0.9 m (3 ft) above ground.
9. If an excavation is a hazard to workers, it must be effectively covered or guarded.
10. A worker must be designated as a spotter at all times when mechanical digging is undertaken. The spotter must maintain visual contact with the equipment operator and the excavation at all times watching for underground utilities. The spotter must signal the equipment operator to stop digging immediately if any unexpected utilities are encountered.
11. All workers must maintain a safe distance from the radius of the backhoe bucket. Workers must never walk under a loaded bucket due to the danger of falling debris, hydraulic failure or operator error. Eye contact is required to be made with the operator prior to entering the hazard bite zone (radius of backhoe/excavator swing radius).
12. All equipment and machinery must maintain a safe distance from overhead hazards. The "Limits of Approach" as outlined in the WCB OSHR Section 19.23. Table 19-1 must be adhered to when working in close proximity to power lines.

**Table 19-1: General limits of approach**

Voltage Phase to phase	Minimum distance	
	Meters	Feet
Over 750 V to 75 kV	3	10
Over 75 kV to 250 kV	4.5	15
Over 250 kV to 550 kV	6	20

**If the minimum distance in Table 19-1 cannot be maintained because of the circumstances of work or the inadvertent movement of persons or equipment, an assurance in writing must be signed by a representative of the owner of the power system. The "assurance in writing" form is referred to as a WCB form 30M33.**

13. Water must not be allowed to accumulate in an excavation if it might affect the stability of the excavation or endanger workers. Surface water must also be prevented from eroding the slopes of the excavation.
14. If unexpected contact is made with a utility, the accidental contact procedures must be followed as specified in this document.
15. If the excavation work is not complete at the end of the day, the excavation must be covered, fenced or otherwise made safe for the public.
16. **Workers are not allowed to cut into abandoned gas lines or damaged conduit. Workers must not open BC Hydro High Voltage Vaults.** Permission and direction must be obtained from the utility owner with regards to handling damaged or abandoned conduit. Document the name and contact information of the utility representative that provides the City with guidance and direction.

17. When cutting Asbestos containing pipe, Asphalt or Concrete workers must suppress the dust by using wetting techniques and wear an appropriate personal protective equipment ie. respirator, tyvek suit (disposable coverall), etc. Please see the Silica exposure control program for further details. Please review Engineering Operations AC pipe cutting safe work procedures.
  
18. A Notice of Project must be filed 24hrs prior to a planned excavation / construction project if (a) the total cost of labour and materials for the work exceeds \$100 000, or the construction project includes a trench more than 1.2 m (4 ft) in depth and over 30 m (100 ft) in length or includes another type of excavation more than 1.2 m (4 ft) in depth, which a worker may be required to enter.

## SLOPING AND SHORING REQUIREMENTS

1. Before a worker enters any excavation over 1.2 m (4 ft) in depth or, while in the excavation, approaches closer to the side or bank than a distance equal to the depth of the excavation, the excavation sides must be sloped or supported as specified by a professional engineer or geoscientist, or the sides of the excavation must be:
  - a) Sloped to safe angle - no slope can be steeper than 0.9 m (3 ft) horizontal to 1.22 m (4ft) vertical (see Appendix ),
  - b) Benched - bench width shall not be less than 1.5 times the height of its rise below (see Appendix B),
  - c) Supported in accordance with the minimum requirements of section 20.85 of the Regulation, or
  - d) Supported by manufactured or prefabricated trench boxes or shoring cages, or other effective means.

If the end of a trench over 4 feet in depth is not adequately sloped, end shoring must be installed unless:

- a) A worker in the trench is not required to approach closer to the end of the trench than a distance equal to the depth of the trench at that end,
  - b) Where, for the prevailing soil conditions at the end of the trench, the permissible spacing of uprights equals or exceeds the width of the trench, or
  - c) Otherwise authorized in writing by a professional engineer.
2. A safety spotter must be designated to each excavation while a worker is in the excavation to identify any potential hazard that may occur while the work is being performed. Equipment Operators and Truck Drivers may be designated as spotters, they must remain in a position while designated as the spotter to observe and communicate at all times with the excavation worker.
  3. Any engineered excavation support system must have certified design documentation available on site. It must also be inspected daily and maintained in a fully effective condition.
  4. Shoring is installed from the top down and removed in the reverse order.
    - Workers are not allowed in an unsupported trench to compact backfill.
    - Workers must not enter an excavation to remove shoring materials if ground conditions have deteriorated so as to make entry for shoring removal unsafe.
  5. Excavation support systems must be installed so that they are firmly in contact with the face of the excavation. This can be achieved by back filling or blocking.
  6. Shoring must extend above the top of the excavation by at least 0.3 m. (1 ft.) and must be as close to the bottom of the trench as is possible but in no case more than 0.6 m. 2 ft. from the bottom. A exception is given to the 0.3 m (1 ft.) extension above the ground for excavation using road plates.
  7. When a combination of sloping and shoring is used the minimum amount of shoring must be equivalent to the standard for the overall depth of the excavation (see Appendix C).

## CONSTRUCTION SAFETY CHECKLIST FORM

A Construction Safety Checklist must be completed for all jobsites involving mechanical digging. A communication jobsite meeting must be held with all site workers prior to the start of any excavation.

It is the responsibility of all workers participating in the excavation to sign the form once they have reviewed it at the site and are satisfied that the information is correct. If any information is unclear or not understood, employees must contact their supervisor for clarification prior to commencing work at the site. The form must remain at the site for the duration of the work for all subsequent workers arriving after the start of the excavation to review and sign. All forms are to be submitted to the foremen for review once the job is completed.

### **Note:**

Where a cut is made for the purpose of a utility repair, the construction safety checklist form is required to be completed prior to the removal of the asphalt.

## SITE SAFETY

It is essential that the health and safety of the general public who work or travel in the vicinity of the excavation be taken into account. The excavation site should be barricaded off and made highly visible. If possible, keep the road and sidewalks clear of debris for vehicle and pedestrian traffic. A detour needs to be provided if a sidewalk is closed. Orange cones should be placed over tripping hazards such as exposed valves. If the excavation work is not complete at the end of the day, the excavation must be covered, fenced or otherwise made safe for the public.

## EXPOSING UNDERGROUND UTILITIES

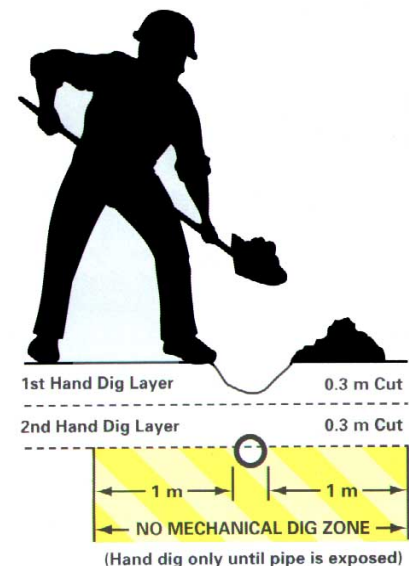
The “No Mechanical Dig Zone Boundary Limit” is defined to be equal to the diameter of the conduit or cable plus one meter in any direction of the utility. Within 1 m. (3ft. 3 in.), the utility must be located by hand digging or hydro-excavating. Once the utility has been exposed in a sufficient number of locations to determine its routing, mechanical digging may resume up to 0.3m (1ft.) from the utility.

### **Mechanical digging is not permitted:**

- to dig within the “no mechanical dig zone boundary limit” until the utility is exposed.
- within 0.3m (1ft.) of a utility at any time.

### **Hydro-excavating is permitted:**

- within the “no mechanical dig zone boundary limit” and to expose the utility.



## **WORKERS ARE NOT TO CUT INTO ABANDONED GAS LINES, DAMAGED CONDUIT, SHAKE DAMAGED UTILITIES AND OPEN BC HYDRO HIGH VOLTAGE VAULTS.**

If the BC One Call information package indicates that the abandoned gas line has been cut at the Main you must still Contact utility owner for direction.

Contact BC Hydro or other utility owners for site evaluation and location determination if utility information is conflicting.

## **EXCAVATION PARALLEL TO A BURIED FACILITY**

Quite often, construction activities such as road construction or curb and gutter replacement require excavation parallel to a buried facility. The excavator is cautioned that buried facilities, particularly shallow utilities - telephone, cable TV, electric and natural gas - are not necessarily installed in a straight alignment.

1. Determine the location of the utility with Electronic Locating Device (Metro Teck, M-scope, Rigid),
2. Mark the asphalt
3. Be Careful /Gentle
4. Ensure that the soil is native
5. Have locator on site – get depth reading
6. Ensure that 0.3m is maintained from the excavator bucket and location of parallel buried facility
7. **Dig very cautiously to depth of parallel utility**
8. Use locator to verify distance of trench side to the parallel gas utility
9. Once the location is verified by the detector you can proceed
10. Confirm continuous running line with locator every 10 meters

**Note:** When locating gas utility, please remember that it is the tracer being located and not Polyethylene gas pipe

## **HYDRO EXCAVATION**

- If it is not practical to hand dig, hydrovacing or airvacing may be considered. Hydrovacing is the use of pressurized water to liquefy and loosen soil which is then removed from the excavation by the use of on-truck vacuum systems and hoses. Facility owners may allow hydrovacing as a method of exposing their buried facilities under certain conditions such as certification of operators, maximum pressure, maximum temperature or type of nozzle.
- Hydrovacing is faster and easier than hand digging and is helpful when the excavation is complex and involves multiple lines. Hydrovacing may not work in all situations, and may be expensive. When assessing an excavation technique, you must consider avoiding damage to the coating of facilities as well as the methods of soil disposal.
- Hydrovacing in the vicinity of a buried utility without locates constitutes a ground disturbance with mechanical excavation equipment. Requests for locate information is still required.

## **MARKING UNDERGROUND UTILITIES**

Before excavating or drilling with powered tools and equipment, the location of all underground utilities in the area must be accurately determined and marked.

The thickness of the markings should be 0.5 m. – 0.6 m. (18"-24") in length and 50 mm. (2") in width. The utility should be indicated by initials or by name in letters (150 mm. (6") high on the locate marking. On long locates the facility owner should be indicated every 100'. If the surface over the buried line is to be removed, supplemental offset markings may be used. Offset markings should be on a uniform alignment and must clearly indicate that the actual facility is a specific distance away.

## PERMITS

A work permit is required from Terasen Gas for any activity or work that:

- crosses under or over an Intermediate Pressure (IP) or Transmission Pressure (TP) gas pipeline.
- is within 3m. (10ft.) of the outer surface of the pipeline within the public right of way.

## ABANDONED UTILITIES

If you unexpectedly come across an underground utility that was not previously located, **Stop digging**, review BC One Call maps and City maps to determine if the utility locate was accidentally missed. Call Supervisor for instructions.

Workers are NOT allowed to cut conduit until the Utility owner advises that it is safe to do so and that they authorize the City to perform the task. Violation of this requirement will result in a severe discipline up to termination of employment.

## HAZARDOUS ATMOSPHERES

Atmospheric testing must be conducted in excavations over 1.22m (4 ft.) deep where hazardous atmospheres could reasonably be expected to exist (e.g. landfill areas, near hazardous substance storage or gas pipelines).

## INSTRUCTION OF PROFESSIONAL ENGINEER OR GEOSCIENTIST

Excavation work must be in accordance with the written instructions of a professional engineer if:

- a) The excavation is more than 6 m (20 ft) deep,
  - b) Support structures other than as specified in Section 20.81 of the WCB OSHR are used in the excavation,
  - c) An improvement or structure (building) is adjacent to the excavation,
  - d) The excavation is subject to vibration or hydrostatic pressure likely to result in ground movement hazardous to workers, or
  - e) The ground slopes away from the edge of the excavation at an angle steeper than 0.9m (3 ft.) horizontal to 0.3m (1 ft) vertical.
-

# Construction Safety Check List



A Construction Safety Check List shall be completed for each project and communicated to all workers prior to the start of any construction. This check list must remain at the site for all workers to review. The information identified on this form must be reviewed and understood by all employees working at the job site. All subsequent workers arriving after the start of the project must also review and understand information on this document. If any information is unclear or not understood, employees must contact their supervisor for clarification prior to commencing work at the site.

Project Information			
Project Title / Descript.:			Start Date:
Work Order #:		Site-Supervisor/Foreman:	
Equipment Operator:		Crew Supervisor / Chargehand:	
Location:	WorkSafeBC: Notice Of Project# _____		

Site Hazards, Control Measures and PPE - Check Applicable Boxes					
<input type="checkbox"/>	Underground/Overhead Hazards	<input type="checkbox"/>	Asbestos Pipe	<input type="checkbox"/>	Small Powered Equip
<input type="checkbox"/>	Fire or explosion	<input type="checkbox"/>	Work from height	<input type="checkbox"/>	Slopes / Rollover
<input type="checkbox"/>	Gases, Dusts, Fumes, Vapours	<input type="checkbox"/>	Adjacent Structure	<input type="checkbox"/>	Poor lighting/visibility
<input type="checkbox"/>	Slipping- maintain housekeeping	<input type="checkbox"/>	Spoil placement	<input type="checkbox"/>	Ladder – rails and rungs- good
<b>Personal Protective Equipment:</b> Hardhat <input type="checkbox"/> Hi-Vis Vests <input type="checkbox"/> Safetyboots <input type="checkbox"/> Gloves <input type="checkbox"/> Safety Eyeware <input type="checkbox"/> Respirator <input type="checkbox"/>					
<b>Working Around Heavy Equipment Discussed:</b> <input type="checkbox"/> Eye Contact / Aware of position and traffic					
<b>Environmental:</b> Water accumulation –continuous dewatering <input type="checkbox"/> Cold/Heat Stress <input type="checkbox"/>					
<b>Overhead Hazards:</b> Communicated with operator <input type="checkbox"/> 30M33 <input type="checkbox"/> Clearance Controls Established <input type="checkbox"/>					
<b>Traffic Control:</b> Adequate signs posted <input type="checkbox"/> Barricades <input type="checkbox"/> Traffic Control Persons ( ) <input type="checkbox"/>					
<b>Cave-In protection:</b> Sloped at angles <input type="checkbox"/> Benching <input type="checkbox"/> Shoring <input type="checkbox"/> Professional Engineer/Geoscientist <input type="checkbox"/>					
<b>Hazardous atmosphere:</b> –use gas detection follow Confined Space Entry procedures <input type="checkbox"/>					

Utility Locations BC ONE CALL ■ AS-BUILTS ■ UTILITY DETECTOR ■				
Utilities Mains/Services	Utility in or near construction / excavation		Located & Marked /Scoped Utility (Place check mark)	Comments
	Yes	No		
BC Hydro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Terasen Gas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Trans-Mtn. Pipe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fiber Optic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Telephone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Street Lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sewer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other (i.e. Irrigation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

All underground utilities will be **double checked** during the initial locating, scoping and marking. Due to the time that can elapse from the initial locating, scoping and marking of utilities to the construction period, the utilities within the daily construction and excavation limits will also be checked daily before the start of any construction. All locates will be conducted using the as-built drawings provided by the Utility Companies. The consultant's design drawings shall not be used for locating utilities. Before excavating or drilling with powered tools and equipment, the location of all underground utility services in the area must be accurately determined, and any danger to workers from the services must be removed. All utilities must be located and exposed by hand digging or hydro-excavating. Supervisors / Crew to check off on the Gas / Utility as-built record table to confirm that the services have been located and gas meters on all buildings shall be located and confirm with BC One Call gas as-built service location information.

<b>Completed by:</b> _____ <b>Site Supervisor</b>	<b>Date:</b> _____
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Submit copy of completed check list to manager prior to construction.

## Utilities – Accidental Contact Procedures

May 2010

### **Purpose:**

The purpose of this safety procedure is to:

- Prevent injuries to workers resulting from accidental contact with underground utilities
- Prevent economic loss resulting from accidental contact with underground utilities
- Provide the appropriate response to accidental contact with underground utilities

### **For accidental contact with:**

- Terasen Gas Utility page 1,2
- BC Hydro Electrical Utility page 3
- 7 Steps to Electrical Safety page 4
- Street Lighting Utility page 5
- Communication Utility page 6

### **Section Manager/Manager OHS contact WCB**

**page 7**

Incident Report - Damage To Utility

page 8

## **Accidental Contact with a Gas Utility**

### **Gas line has been struck, jarred, or pulled, or if the wrapping or surface of a pipe has been damaged:**

1. Stop work immediately in the area around the damaged gas line.
2. Turn off vehicles, machinery and eliminate all sources of ignition.
3. Check for the smell or sound of escaping gas in the area. **If gas is detected, proceed to the steps outlined in the next section.**
4. Call the Eng. Ops. Radio Room/Dispatch (604-590-7226) and request Terasen to attend the scene.
  - **Terasen Emergency Line: 1-800-663-9911 or 604-576-7000**
5. Notify the crew supervisor(s)/foreman/chargehand of the incident.
6. If safe to do so, cordon area off with vehicles, barricades, tape, etc.
7. Do not backfill! Terasen must physically check the integrity of the piping system and repair the damage.
8. Work must not resume at the damaged gas line location until Terasen has confirmed that the site is safe for the intended work. Only the City of Surrey (COS) crew foreman/chargehand or project supervisor can authorize the crew to resume work in the excavation.
9. The COS supervisor(s)/foreman must conduct an accident/incident investigation and submit a damage to utility report to Occupational Health and Safety in Human Resources.

**Gas is escaping from a ruptured line:**

1. Stop work immediately and shut down the project.
2. Turn off vehicles, machinery and eliminate all sources of ignition.
3. Evacuate the area – move people upwind if possible – and prevent cars and bystanders from entering.
4. Call the Radio Room (**604-590-7226**) and request Terasen, Fire-Rescue, Manager, Occupational Health & Safety and Eng. Ops. Section Manager to attend the scene.
  - **Terasen Emergency Line: 1-800-663-9911.**
  - **Surrey Fire-Rescue:**
    - **Emergency: 911**
    - **Fire Dispatch: 604-543-6700**
    - **Manager, Occupational Health & Safety: 778-846-0673**
    - **Section Manager: #**
5. Notify the crew supervisor(s)/foreman/chargehand of the incident.
6. If safe to do so, cordon area off with vehicles, barricades, tape, etc.
7. Do not attempt to make temporary repairs or operate any underground gas valves.
8. Work must not resume until Terasen has confirmed that the site is safe for the intended work. Only the COS crew foreman/chargehand or project supervisor can authorize the crew to resume work in the excavation. If safe to do so, please take pictures of damaged utility.
9. COS Supervisors must complete an accident/incident investigation and submit a report to Occupational Health and Safety in Human Resources

*Warnings:*

- Dead gas mains may contain residual natural concentrations in the explosive range for natural gas (5-15% methane in air).
- Polyethylene gas lines generally have a static charge build-up, making it dangerous for unqualified workers to try to stop a gas leak in an excavation involving this type of pipe.

## **Accidental Contact with a BC Hydro Electrical Utility**

(e.g. broken conduit, pulled cable, wires down)

1. If a cable is accidentally contacted, stop work immediately. Treat all electrical components as if they are “live” – do not approach them. **Do not take any steps.** Ensure people keep people well back (stay 10 meters/33 feet away).
2. If you must move on energized ground, shuffle or hop away to a minimum distance of 10 meters/33 feet while keeping your feet together and touching each other never allowing the heel of one foot to go beyond the toe of the other.
3. Call the Eng. Ops. Radio Room (**604-590-7226**) and request BC Hydro, Manager, Occupational Health & Safety, Section Manager and Fire-Rescue to attend the scene.
  - **BC Hydro Trouble Centre: 604-430-2722.**
  - **Surrey Fire-Rescue:**
    - **Emergency: 911**
    - **Dispatch: 604-543-6700**
    - **Manager, Occupational Health & Safety: 778-846-0673**
    - **Section Manager: #\_\_\_\_\_**
4. Notify the crew supervisor(s)/foreman/chargehand of the incident.
5. Move the digger bucket clear of the cable to break contact and stay out of the trench.
6. If the machine can't be moved, keep workers 10 meters (33 feet) away and have the operator remain in the vehicle.
7. If the operator is in danger by remaining in the machine, i.e., an uncontrolled fire, vehicle rollover, the operator should jump off the machine keeping his feet together. Never contact the machine and the ground at the same time.
8. Once clear of the machine, shuffle or hop away to a minimum distance of 10 meters/33 feet while keeping your feet together and touching each other never allowing the heel of one foot to go beyond the toe of the other.
9. If safe to do so, cordon area off with vehicles, barricades, tape, etc.
10. Work must not resume until BC Hydro has confirmed that the site is safe for the intended work. Only the COS crew foreman/chargehand or project supervisor can authorize the crew to resume work in excavation.
11. COS Supervisors must complete an accident/incident investigation and submit a report to Occupational Health and Safety in Human Resources.

### *Warnings:*

If there is an electrical fire, do not use water to control it. Water conducts electricity.

Electricity. Don't take it for granted.



# 7 Steps to Electrical Safety

Learn BC Hydro's Seven Steps to Electrical Safety.

There's a lot to live for.



## 1 Ten Metres to Safety

Stay back at least 10 metres (33 feet) from any fallen power line or exposed underground cable.



## 2 Look Up and Live

Look up, check and keep equipment clear of overhead power lines.



## 3 Know Your Limits

When using equipment in the vicinity of power lines, always maintain the limits of approach: from 3-7 metres (10-20 feet) depending on the voltage.



## 4 Don't Hang Around Operating Equipment

Stay at least 10 metres (33 feet) from operating equipment, in case it contacts an energized line.



## 5 Shuffle or Hop - Don't Step

If your vehicle makes contact with an energized line, remain inside until help arrives. If you must get out due to fire, jump out with your feet together. Then shuffle away, keeping both feet close together. Never contact the ground and your vehicle at the same time.



## 6 Call Before You Dig

To avoid contacting underground power lines, before you dig, call "BC 1 Call" at 1 800 474-6886.



## 7 Don't Become a Victim

Always call local emergency personnel when someone is injured in an electrical accident.

**BC hydro** 

[www.bchydro.com](http://www.bchydro.com)

## **Accidental Contact with Street & Traffic Lighting Utility**

(e.g. broken conduit, wires down)

1. If the cable is accidentally contacted, stop work immediately and shut down the project. Treat all electrical components as if they are “live” – do not approach them. **Do not take any steps.** Ensure people keep people well back (stay 10 meters/33 feet away).
2. If you must move on energized ground, shuffle or hop away to a minimum distance of 10 meters/33 feet while keeping your feet together and touching each other never allowing the heel of one foot to go beyond the toe of the other.
3. Call the Eng. Ops. Radio Room and request Traffic Operations Section to have Cobra Electric attend the scene.  
*Note: Radio Room is to inform Traffic Operations.*
  - **Traffic Operations Section – 604-591-4205 (8:30am-4:30pm)-Rhonda Hallett**
  - **Cobra Electrics- 604-594-1633**
  - **After hours – 604-591-4338- follow prompts.**
4. Notify the crew supervisor(s)/foreman/chargehand of the incident.
5. Move the digger bucket clear of the cable to break contact and stay out of the trench.
6. If the machine can't be moved, keep workers 10 meters (33 feet) away and have the operator remain in the vehicle.
7. If the operator is in danger by remaining in the machine, i.e., an uncontrolled fire, vehicle rollover, the operator should jump off the machine keeping his feet together. Never contact the machine and the ground at the same time.
8. Once clear of the machine, shuffle or hop away to a minimum distance of 10 meters/33 feet while keeping your feet together and touching each other never allowing the heel of one foot to go beyond the toe of the other.
9. If safe to do so, cordon area off with vehicles, barricades, tape, etc.
- 10. Work must not resume until the crew foreman/chargehand or project supervisor confirms that the site is safe for the intended work.**
11. COS Supervisors must complete an accident/incident investigation and submit a report to Occupational Health and Safety in Human Resources

### *Warnings:*

If there is an electrical fire, do not use water to control it. Water conducts electricity.

## **Accidental Contact with Communications Utility**

(Telus, Shaw, Fibre Optic or Copper Cable)

1. If a communications cable is accidentally contacted, stop work immediately and shut down the project.
2. Call the Radio Room and request that the communication company attend the scene.
3. Notify the crew supervisor(s)/foreman/chargehand of the incident.
4. If the identification of the communication utility cannot be determined, the project must be shut down until the excavation is deemed safe to work.
5. Work may only resume if the site is deemed safe by the COS supervisor(s)/foreman/chargehand, project supervisor or section manager.
6. COS Supervisors must complete an accident/incident investigation and submit a report to Occupational Health and Safety in Human Resources
  - **Shaw – -8am-4pm- 604-629-3162**
  - **Telus – 611**
  - **Risk Management – 604-591-4738 – Jeff Schaafsma**

**Section Manager or Manager, Occupational Health & Safety contact WorkSafeBC immediately when:**

The occurrence of any accident that

- (a) resulted in serious injury to or the death of a worker,
- (b) involved a major structural failure or collapse of a building, bridge, tower, crane, hoist, temporary construction support system or excavation,
- (c) involved the major release of a hazardous substance, or**
- (d) was an incident required by regulation to be reported.

(2) Except as otherwise directed by an officer of the Board or a peace officer, a person must not disturb the scene of an accident that is reportable under subsection (1) except so far as is necessary to

- (a) attend to persons injured or killed,
- (b) prevent further injuries or death, or
- (c) protect property that is endangered as a result of the accident.

*Note: A major release does not only mean a considerable quantity, or the peculiar nature of the release, such as a gas or volatile liquid, but, more importantly, the seriousness of the risk to the health of workers. Factors that determine the seriousness of the risk include:*

- The degree of preparedness of the department to respond to the release,
- The necessity of working in close proximity to the release,
- The atmospheric conditions at the time of the release, and,
- The nature of the substance.

A major release can be considered to have occurred if:

- The incident resulted in an injury that required immediate medical attention beyond the level of service provided by a first aid attendant, or injuries to several workers that require first aid, or
- The incident resulted in a situation of continuing danger to workers, such as when the release of a chemical cannot be readily or quickly cleaned up, or
- The release is due to exposures not normal to the operation or not under immediate control

Situations that should be considered a "Major Release" include the following if:

- High voltage line contact
- It was necessary for people to be evacuated from buildings,
- Gas seeped into sewers or drains,
- Any person required medical treatment,
- The gas leak ignited,
- Workers entered the gas envelope when the atmosphere contained flammable gas or vapor concentrations in excess of 20% of the LEL; and
- A non-gas company worker entered an excavation, after a contact, to attempt to stop or slow the flow of gas.

**1. WorkSafeBC-Prevention Division Contact Number – 604-276-3100 ( 8:30am-4:30pm)**

**After hours emergency number- 1-866-922-4357 Fraser Valley Tel-serve-passes message to WorkSafeBC duty manager.**

**CITY OF SURREY**

**INCIDENT REPORT - DAMAGE TO UTILITY**

B.C. GAS	<input type="checkbox"/>	TIME: _____ AM/PM	DATE: _____
B.C. HYDRO	<input type="checkbox"/>	EQUIPMENT: C.O.S. _____	
CABLEVISION	<input type="checkbox"/>	HIRED: _____	
TELUS	<input type="checkbox"/>		
OTHER	<input type="checkbox"/>	_____	

**DESCRIPTION OF INCIDENT & DAMAGE UTILITY:**

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(ATTACH PHOTOGRAPH IF POSSIBLE)

ADDRESS: \_\_\_\_\_

WORK ORDER # \_\_\_\_\_

FOREMAN OR CHARGEHAND: \_\_\_\_\_

PROJECT DESCRIPTION: \_\_\_\_\_

UTILITY COMPANY NOTIFIED: YES \_\_\_\_\_ NO \_\_\_\_\_ ATTACH THEIR REPORT

UTILITY COMPANY REFERENCE AND CONTACT NUMBER \_\_\_\_\_

RADIO ROOM & MANAGER NOTIFIED YES \_\_\_\_\_ NO \_\_\_\_\_

ATTACH DIAGRAM SHOWING LOCATION OF SERVICE

**What could have been done to prevent this incident?**

(please refer to other side for assistance)

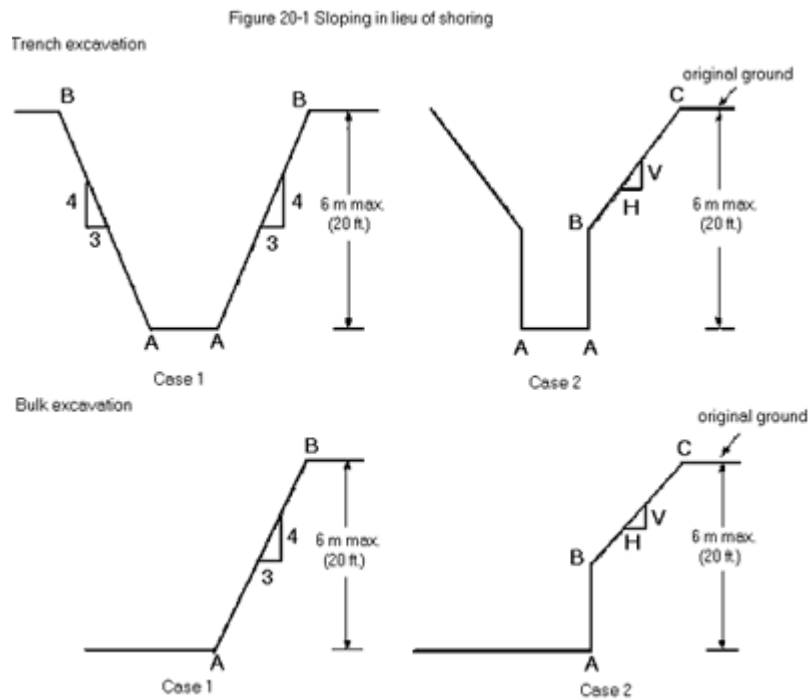
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FACTORS TO CONSIDER:

- NO PLAN AVAILABLE THAT SHOWS UTILITY LOCATION
- DID NOT LOCATE UTILITY PRIOR TO EXCAVATION – LACK OF PLANNING
- OPERATOR ERROR
- DID NOT HAND DIG WHEN REQUIRED
- UTILITY IN WRONG LOCATION
- UNFORESEEN UNDERGROUND OBSTACLES
- OTHER:

## APPENDIXES

### Appendix– Sloping in lieu of shoring



Case 1 (trench or bulk excavation) - maximum slope of excavated face, shown as line AB, in hard and solid soil is 3 horizontal to 4 vertical.

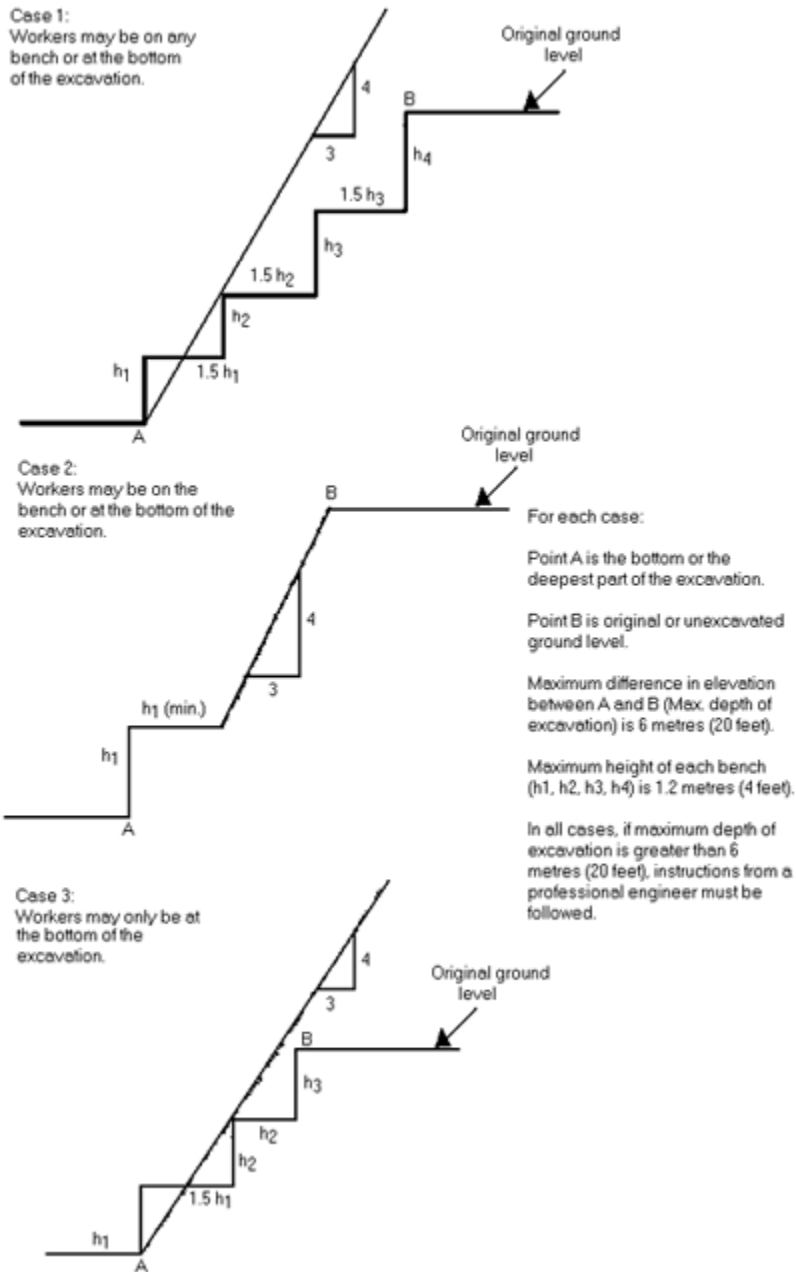
Case 2 (trench or bulk excavation), maximum height of vertical portion, shown as line AB is 1.2 meters (4 feet).

For Case 2 (trench or bulk excavation), the maximum permissible slope of the excavated face BC for the corresponding height of the lower vertical cut AB is as follows:

Height of line AB		Maximum slope of line BC (in hard and solid soil)
centimeters	feet	
up to 30	up to 1	1 horizontal (H) to 1 vertical (V)
30 to 60	1 to 2	3H to 2V
60 to 90	2 to 3	2H to 1V
90 to 120	3 to 4	3H to 1V

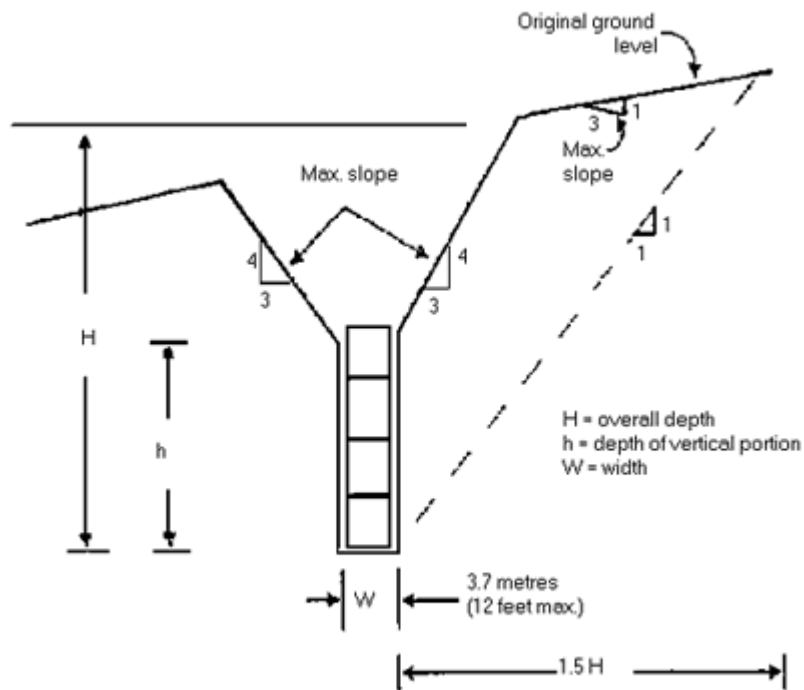
Appendix- Benching in lieu of shoring

Figure 20-2: Benching in lieu of shoring



Appendix - Combined supporting and sloping

Figure 20-3: Combined supporting and sloping



Shoring must be adequate for excavation depth H.  
Depth H cannot exceed 6 metres (20 feet).