

1.0 INTRODUCTION

Trenching and excavation work present serious hazards to all workers involved. Cave-ins pose the greatest risk and are more likely than some other excavation-related incidents to result in worker fatalities. Employers must ensure that workers enter trenches only after adequate protections are in place to address cave-in hazards.

2.0 SCOPE

This standard applies to all employees working in or near excavation and trenching work.

3.0 REFERENCES

NB OHS General Regulation 91-191	New Brunswick Occupational Health and Safety Regulation 91-191 Part XV: Section: 180-188
HSEE-03-01	Hazard Identification, Assessment and Mitigation
HSEE-03-16	Fall Protection
HSEE-03-17	Confined Space

4.0 TERMS AND DEFINITIONS

Excavation	any man-made cut, cavity, trench or depression in the ground, formed by the removal of earth.
Trench	an excavation in which the depth exceeds the width.
Ground Disturbance	any work, operation or activity that results in a disturbance of the earth, including excavating, digging, trenching, ploughing, drilling, tunneling, auguring, backfilling, blasting, topsoil stripping, land leveling, peat removing, quarrying, clearing and grading.
Supervisor	a person who is authorized by an employer to supervise or direct the work of the employer's employees regardless of title, this could be a lead, senior, foreman, etc.

5.0 ROLES AND RESPONSIBILITIES

5.1 Supervisor

- as this is a high risk activity all work conducted inside the trench must be directly supervised by a competent person
 - assign a competent employee who is responsible for inspecting the trench and capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to workers, and who is authorized to take prompt corrective measures to eliminate them.
 - ensure that shoring, bracing or caging for an excavation or trench is certified as adequate by an engineer and shall make the proof of the certification available to a WorkSafeNB officer on request.
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- Ensure that the location of any underground utility services (natural gas, electrical, sewage, waterlines, telecommunications, etc.) is determined before beginning an excavation or trench.
- Acquaint employees with the hazards and control measures associated with their work.
- Provide the information and instruction necessary to ensure their health and safety.

5.2 Employee

- Follow safe work procedures
- Do not work inside trenches if they are not adequately protected from cave-ins and other risks.
- Wear all required personal protective equipment provided by the employer, such as hard hats, safety boots and safety glasses.
- Conduct daily checks on temporary structures for possible defects.
- Be aware of all potential health and safety hazards/risks and the controls put in place to prevent them.
- Be aware of hazards in excavations including soil conditions.
- Report promptly to the employer or supervisor any hazardous situations of equipment and work site.

5.3 Engineer

- When shoring, bracing, trench box or caging are required, ensure they are certified by an engineer before use and shall make the proof of the certification available to a WorkSafeNB officer on request.

6.0 STANDARD

General

Excavation and trenching are among the most hazardous construction operations. The expectation of underground utility owners and WorkSafeNB is that to ensure the protection of employees and the equipment of the utility, locations must be determined before the ground disturbance. The requirement under the OHS Act for employers and contractors to obtain locates in other circumstances is found in Sections 9(1)(a) and 10(b) of the OHS Act.

NEVER enter an excavation that is not safely shored, sloped, braced or caged. If there is a cave-in, even a small one, **GET OUT OF THE TRENCH AND STAY OUT** until the excavation has been made safe!

6.1 Pre-planning (Hazard Assessment)

Working in trenches and excavations is hazardous to both the workers who work inside them, and to workers on the surface. Where there is a lack of a work method, a Hazard Assessment must be completed during the planning stage. Some of the hazards include:

- Cave-ins or collapses that can trap workers.
- Equipment or excavated soil falling on workers (e.g., equipment operated, or soil/debris stored too close to the excavation).
- Falling into the trench or excavation.
- Flooding or water accumulation.
- Exposure to a hazardous atmosphere (e.g., gas, vapour, dust, or lack of oxygen).
- Contact with buried service lines such as electrical, natural gas, water, sewage, telecommunications, etc.
- Contact with overhead electrical lines.
- Slips, trips and falls as workers climb on and off equipment, or from inappropriate access and egress methods.
- Being struck by moving machinery, or by falling or flying objects.
- Hazards related to materials handling (e.g., lifting, struck by, crushed between, etc.).

6.2 Installation

- Keep excavated material at least 1.2 m away from the edge of an excavation or trench.
- Ensure that utility poles, posts and similar structures are supported or removed if they are within 3 m of an excavation or trench that is more than 1.2 m deep.
- Remove any loose material that may fall into the excavation or trench.
- Ensure that there is a competent employee working on the surface who can observe the employees working in the excavation or trench.
- Ensure that an adequate barrier (jersey barrier) is set up around the excavation or trench so as to protect employees working in the excavation or trench from vehicular traffic.

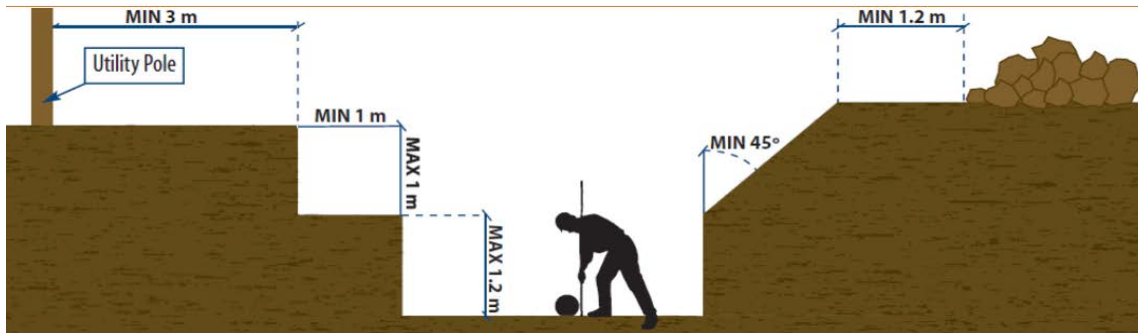
6.3 Access / Egress

Whether the trench is sloped, shored, or protected by a trench box, you need a way to climb in and out of it safely.

An employer shall ensure that an employee does not, and no employee shall, enter an excavation or trench 1.2 m or more in depth unless

- the walls of the excavation or trench are supported by shoring, bracing or caging, the excavation or trench is cut in solid rock or the excavation or trench is sloped or benched to within 1.2 m of the bottom of the excavation or trench with the slope not exceeding 1 m of vertical rise to each 1 m of horizontal run,
 - loose material that may fall into the excavation or trench has been removed, and
 - a ladder that extends at least 1 m above the excavation or trench is installed no more than 15 m from where the employee is working or some other safe means of access and egress is provided.
 - Trenches must be provided with ladders in the areas protected by shoring or trench boxes. The ladder must be securely tied off at the top, extend above the shoring or box by at least 1 m (3.3 feet) and be inspected regularly for damage.
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- A ladder should be placed as close as possible to where you are working and never more than 15 m (50 feet) away.



6.4 Shoring, Bracing, Caging

An employer shall ensure that the walls of an excavation or trench are supported by shoring, bracing or caging except when the excavation or trench

- is less than 1.2 m deep,
- is cut in solid rock,
- is sloped or benched to within 1.2 m of the bottom of the excavation or trench with the slope or bench not exceeding 1 m of vertical rise to each 1 m of horizontal run, or
- is one that an employee is not required to enter.

Where the walls or crests of an excavation or trench are cut in solid rock and are not stable, an employer shall ensure that the walls and crests are adequately supported by rock bolts, wire mesh, shoring or a method that provides equivalent support.

Where powered mobile equipment or a mobile crane is used near the edge of an excavation or trench, an employer shall ensure that any shoring, bracing or caging for the excavation or trench is adequate to support the increased pressure.

An employer shall ensure that shoring, bracing or caging for an excavation or trench is certified as adequate by an engineer and shall make the proof of the certification available to an WorkSafeNB officer on request.

6.5 Hazardous Gases

Precautions must be taken to prevent the accumulation of hazardous gases in an excavation or trench and that adequate ventilation is provided.

Where an employee may be exposed to a hazardous gas or to an oxygen deficient or oxygen rich atmosphere in an excavation or trench, an employer shall ensure that testing is carried out in accordance with Corporate H&S Standard HSEE-03-17 Confined/Enclosed Space, before the employee enters the excavation or trench.

6.6 Underground Locates

Before excavating, underground locates must be done to identify buried service lines such as electrical, natural gas, water, sewage, telecommunications, etc.

If the accuracy of the underground locate is in question or if there are buried utilities, you must daylight the underground facilities.

Note: Verify that the underground locates have not expired as most have expiration dates.

6.7 Mobile Equipment

An employer shall ensure that an operator of powered mobile equipment or a mobile crane does not lower material into an excavation or trench, and no such operator shall lower material into an excavation or trench, unless

- the operator has unrestricted visibility, or
- a signaler is used to direct the movement of the material.

An employee shall not move under or stay under any material being lowered into an excavation or trench.

6.8 Inspections

Inspecting protective systems in trenches is everyone's responsibility and should be checked regularly by a competent person.

In trench boxes, look for:

- Deformed plates
- Bent or distorted welds in sleeves and struts
- Missing struts
- Bent struts
- Holes, bends, or other damage to plates
- Inspection tags (engineer stamped)

After installation continuously inspect:

- areas near shoring where water may have seeped in. The combination of water and granular soil can lead to washout. This undermines the trench wall and has killed and injured workers on several occasions.
- trench boxes for damage, cracks in welds, and other defects.
- the box regularly and often to make sure that it is not shifting or settling more on one side than the other. This can indicate the movement of soil or water underneath. If the box is shifting or settling, get out and tell your supervisor about it.
- the ground around trenches should be inspected for tension cracks. These may develop parallel to the trench at a distance of about one-half to three-quarters of the trench depth.

Note: If you find cracks in the ground, alert the crew and double-check your shoring or trench box.

Note: It's dangerous to overlook damage or defects. Report any of these conditions to your supervisor.

6.9 Training

- Trenching Awareness course

7.0 APPENDIX

N/A

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Director of Total
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