Trenching is a high-risk work activity in Ontario. Workers continue to be seriously injured or killed because proper procedures were not put in place or followed.

Last summer, the Ontario Ministry of Labour (MOL) conducted a two-month blitz on trenching hazards. MOL inspectors made 994 field visits to 862 workplaces and issued 1,683 orders—151 of which were stop-work orders.

These were the most frequent issues they found:
- Trenches that were 1.2 m (4 ft) or deeper did not have the proper support systems to prevent the walls from collapsing.
- Material, excavated soil, and equipment was not kept at a safe distance from the upper edge of the trench wall.
- Workers were not wearing hard hats to protect against falling debris.
- Workers did not have a safe way to enter or exit the trench (e.g., a ladder).
- Written emergency procedures were not posted at the project.

Legislation
A trench is a type of excavation where the depth of the hole exceeds the width. The health and safety requirements for trenching can be found in the Excavations section (Part III) of the Construction Projects regulation (213/91, s. 222 to 242).

The legislation defines the different soil types. Each type has different shoring and timbering requirements to prevent the trench walls from collapsing. Some trenches may require an engineered, hydraulic, or prefabricated support system designed by a professional engineer.

Soil types
The type of soil in the trench will determine its strength and stability. Identifying soil types requires knowledge, skill, and experience. Even hard soil can contain faults that make it unstable when excavated. Be aware that soil types and conditions can change within a short period of time (due to weather conditions) or over short distances.

Cave-ins
Even after you determine the soil type, other factors can affect the stability of trench walls. These include moisture, vibration, weather, surcharge (heavy loads placed near the trench), previous excavation, and being too close to existing foundations.

There are three basic methods of protecting workers against trench cave-ins:
1. Sloping
2. Trench boxes or shields
3. Shoring.
This system must be designed by a professional engineer and the design drawings kept on site.

Sloping
Sloping can reduce the risk of a trench collapsing by cutting back the walls at specific angles, depending on the soil type. Sloping is also used with shoring or trench boxes to cut back any soil above the protected zone.

Type 1 and 2 soils require walls to be sloped at a 45-degree angle beginning 1.2 m (4 ft) above the bottom of the trench. This works out to 1 m back for every 1 m up (i.e., a 1-to-1 gradient).

Type 3 soil also requires a 1-to-1 gradient, but from the bottom of the trench.

Type 4 soil requires a 1-to-3 gradient from the bottom of the trench. That’s 3 m back for every 1 m up.

Safe work practices
• Never work alone in a trench.
• Always have a ladder or other safe way to enter and exit a trench. Ladders must be securely tied off at the top and extend at least 1 m (3 ft) above the shoring or trench box. Keep the top and base of the ladder free of debris and puddles of water.
• Keep trenches dry. If required, use a pump and wear rubber boots.
• Keep a level area 1 m from the upper edge of each trench wall clear of equipment, excavated soil, and building materials. This will prevent material and equipment from falling into the trench. Also, the weight can put pressure on the trench wall, causing it to collapse.
• Use barricades, barriers, or signallers to help equipment operators stay clear of trenches. This will protect workers from being struck by moving machinery.
• If a person could fall into a trench that is more than 2.4 m (8 ft) deep, provide a barrier at least 1.1 m (42 in) high at the top.
• Never enter a trench deeper than 1.2 m (4 ft) unless the walls are sound, made of solid rock, properly sloped or shored, or protected by a trench box.
• Wear a hard hat and eye protection to prevent injuries from falling and flying objects.
• Ensure that all gas, electrical, and other services around the excavation area are located and marked. Most locates can be arranged by contacting Ontario One Call at on1call.com
• If a utility service poses a hazard, it should be shut off. If it can’t be shut off, ask the utility owner to supervise the work.

How IHSA can help
Visit the Trenching and Excavation topic page on the ihsa.ca website. It contains safety information and links to products and downloadable resources.