



Pro Rescue Services

TRENCH SAFETY AWARENESS



Examples of trench/excavation collapse

Sheer Wall Collapse



Examples of trench/excavation collapse

Slough In Collapse



Examples of trench/excavation collapse

Trench Wall Crack

Background



We had a client that asked if we could provide some training on working safely in and around trenches/excavations. They stated that they commonly work in excavations and would like to know if there were any improvements they could make, as well as receiving some training on how to get an injured worker out of a trench safely.

We conducted the first training session with our client and did identify some issues with the shoring being used improperly. In addition we found that there had not been much preparedness done in the case of a trench collapse.

Background



The very next day another excavation/trenching contractor had a trench collapse at their worksite which resulted in a worker being completely buried in the trench.

Both of these contract companies work for one of Pro Rescue Services clients that is a large utilities provider in the Edmonton area. The utilities provider asked the contract company that had experienced the trench collapse if we could assist and they readily accepted.

As with the earthworks company we had provided training to, we also identified many shortfalls in the way trenches/excavations were being handled.

Substandard findings



These contractors provide support on existing water distribution lines and some sewer lines. These lines are typically in areas (residential) where cutting back a trench is not an option so securing the trench must be completed for entry.

One of the most important things found was improper shoring placement in trenches. All contractors were utilizing air-shoring with uprights and stringers to support their excavations. Workers were installing shoring struts from the bottom of excavations, up!

Soil conditions change from one excavation to another, however most are not "hard and compact".

Substandard findings



The companies mostly had their own upright panels and stringers for use in trench shoring, but rented the air-shoring that was used. Two different brands were used, those being Airshore and Proshore.

These type of shoring struts are air-actuated, it was found that regulators were coming from the rental providers set too high. The contractors were in effect shocking their excavations when shooting these struts into place. This action in itself could have created a trench to become unstable or collapse.

The placement of the shoring struts was almost always found to be too far apart from one another or in the case of the end of trenches, missing all together. Also struts placed on panels instead strong backs.

Substandard findings

No structural nail or structural screw being used to hold in the base plate. This was resulting in already placed struts falling out of place when additional struts were shot into place. This problem was even worse due to the higher than recommended pressure struts were being put into place at.

There was no understanding of second collar pins on struts locking system. These second pins are intended for vertical use or in applications with heavy side load.

There were many instances where trenches were found with uprights not close together, large voids behind uprights and also very large sections of the trenches left unprotected where utility lines were running through the side of the trench.

Rescue from shored trench



Not intended for rescue from “collapsed trench”!

Some had equipment for rescue from shored trench, some did not. In all cases there were not adequate plans established for rescue.

Training centered around how to get injured worker out, how to safe out the area to ensure no damage to trench during emergency, how to safe out equipment, control of general public in residential areas, assistance with responding municipal services.

Rope Rescue System



Trench Collapse Situation



Trench Collapse Situation.

A contractor was conducting hydrovac work on the edge of a shored trench. The trench section that workers were intended to enter and work inside, was protected by an engineered shoring box.

The hydrovac operator was standing on the outside of the shoring box, essentially on the edge of the excavation. The ground beneath the worker collapsed and the worker fell in and was completely covered.

Another worker happened to look over and saw the hydrovac operator was not there, he went over to look.

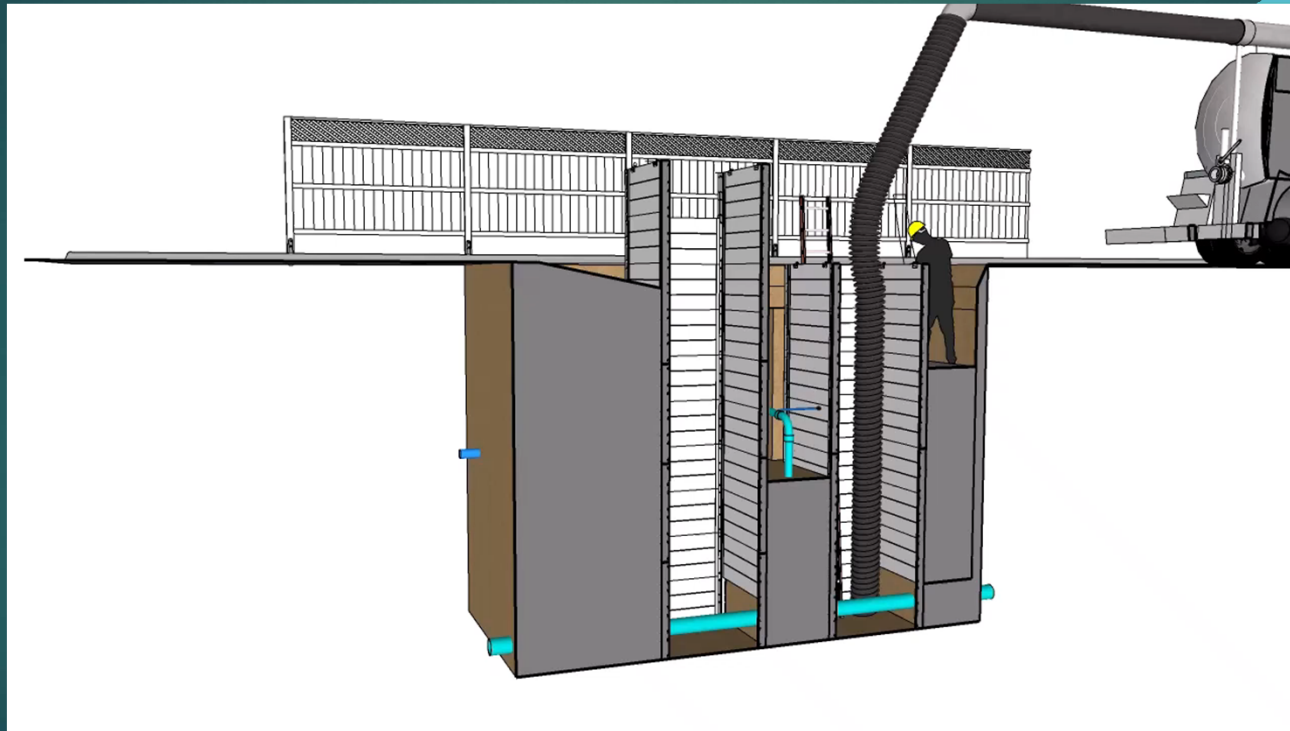
Trench Collapse Situation.

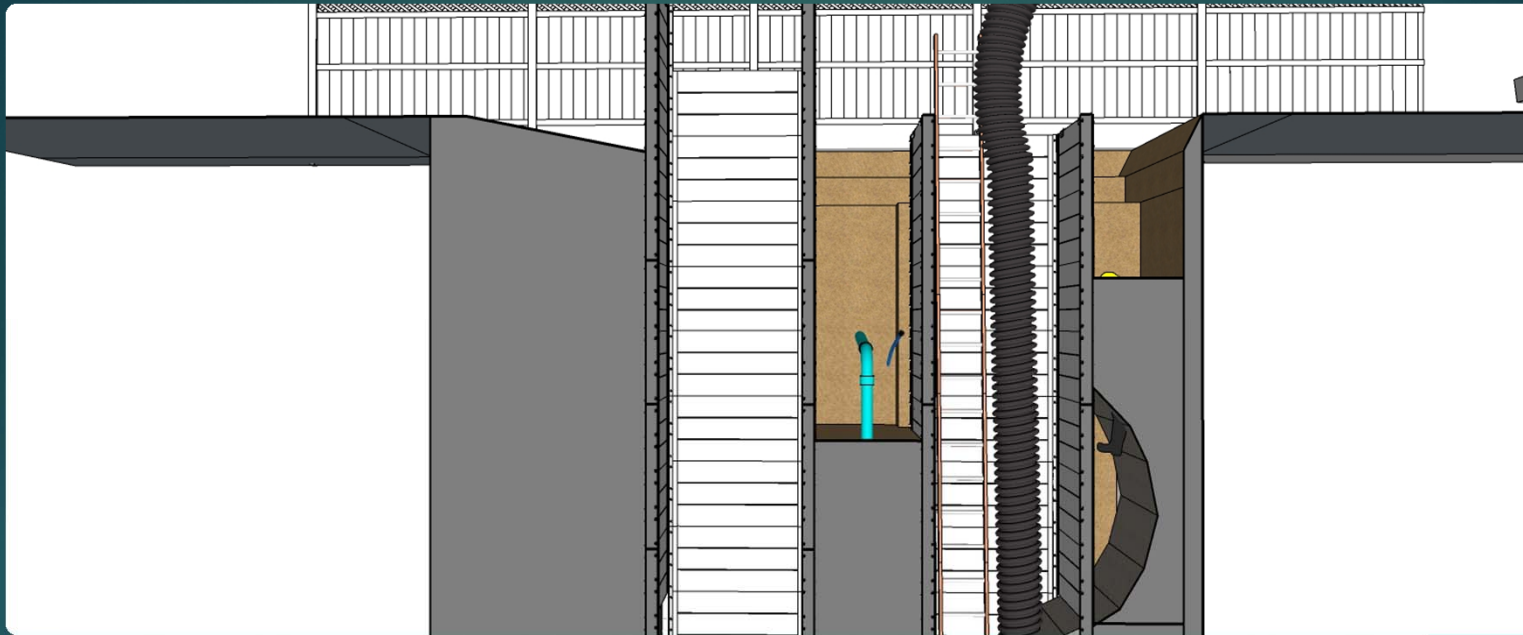
When the worker got to the location the hydrovac operator had been, all he could see was the fingers of the workers gloves sticking up out of the ground.

The worker jumped into the excavation close to the buried worker and began to dig. He successfully exposed to workers head and face which allowed the hydrovac operator to be able to breathe.

Edmonton Fire Rescue was called and the Technical Rescue team responded in a very short time frame. The worker was rescued from the trench in approximately 3 ½ hours time!

Re-creation of the Incident





Worker buried in trench collapse

Void created from earth sloughing into the bottom of the shoring box

Incident Findings



The hydrovac worker was not tied off (fall restraint) to the truck, which we are told is the standard.

There were voids on the side of the shoring box and voids at the bottom of the shoring box which most likely led to the sloughing of material causing void for worker to fall into.

Additional worker jumped into trench to attempt help or rescue, could have become a second victim.

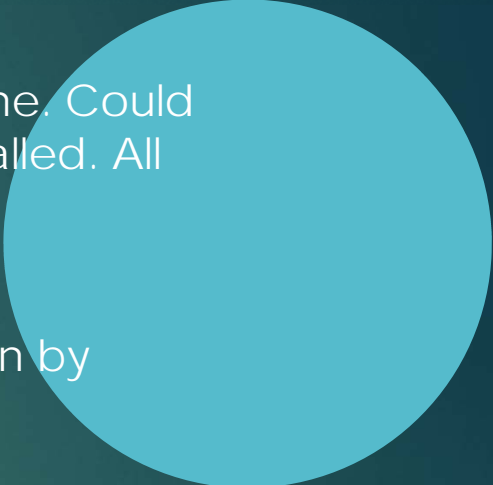
This area had been excavated in the past and filled in, this lead to the ground around the shoring box being very loose. This point most likely played a big part in the buried worker being saved.

Incident Findings



Void was left at the bottom of the box because of existing line. Could have been sheeted around and additional shoring strut installed. All voids are a potential location for trench collapse.

Emergency response/rescue plan was not consistently known by workers.



Questions?

