HOW TO...

Carry out a safe and efficient trench rescue operation

When on his home turf in Queens, New York, FDNY firefighter and rescue instructor John Tew often faces trench rescue operations. Pointing out that this type of incident is easily one of the riskier rescue disciplines, he takes us through the correct process on a step-by-step basis.

Workers never go to work expecting it to be the last day of their lives, but the day complacency sets in is the day that we as rescuers need to be on top of our game.

Trench rescue operations are easily one of the most dangerous incidents we respond to as rescuers and the dangers of secondary collapses are multiplied as the length of the incident grows. This type of rescue is necessary when someone becomes trapped or buried underground. Rescuers need to be aware of their surroundings and familiar with the procedures set in place by their governing body in reference to trench awareness, stabilisation and worker removal. Regardless what methods or techniques are required, there is no room for mistakes or hesitation.

Trench rescue is considered a type of confined space rescue that includes any situation where someone has become trapped in an earthen hole that is deeper than wider. As a rescuer we are responsible for reinforcing the walls of the crumbling hole, determining the best method to retrieve the victim, and mitigating any incident that may have caused or was caused by the collapse. The unpredictability and the sheer weight of the earth make this an extremely delicate operation that may include the use of more than one rescue team, along with professionals from the construction industry. To perform the operation successfully, trained rescuers may use any combination of tools available. Some teams may come with pneumatic equipment pre-rigged to shore the walls of the trench and others may use basic things such as hammers, plywood and dimensional lumber to support the weakened walls.

Training ensures the extra vigilance required.

A typical training class consists of at least a four-hour lecture followed by up to 16 hours of hands-on training, involving real trenches. Be especially careful during these scenarios, because of all training classes conducted, conducting an operation in a live trench is the most dynamic, fluid and ever changing kind of training class. Special attention should be given to ensure all participants and instructors are ever vigilant to the potential change in conditions. Instructors should divide the training into two main sections. The first part involves identifying the risk and assessing the situation at hand. The second half deals with the actual rescue and dealing with the victim. Before rescuers can start the process of victim retrieval, they need to learn how to secure the area. This includes size-up issues, reinforcing the area via ground pads and planks and soil classification. All soils should be classified as type C in a trench that has already collapsed.

Trench rescue can happen almost anywhere, for instance when a small town contractor, which is water sealing the foundation of a house, to a sub-contractor hired by a large industrial company to perform tasks around a plant. The only real difference between both incidents will lie in the time it takes to activate the 911 system. A small town contractor will possibly be working alone, but by the time the homeowner notices he is missing, it may be a while. A company subcontracted by a larger industrial type facility, however, will likely have several workers in the area, so the time between the cave-in and the call activating the local technical rescue team would be shorter.

Some important things to remember before attempting to "jump in" and rescue a victim.

- Approach the trench from the shortest side; it is a proven fact that shorter sides of trenches are 20 times less likely to collapse than the longer sides.
- Be sure all equipment is turned off, locked out and tagged out.
- Remove all employees, onlookers, wannabe rescuers and other non-essential people from around the trench. The less people we have at the edge of the trench, the better it is for the victim and ourselves.
- If the victim is able to help himself, lower a shovel to him so he may attempt to self-extricate. Also a rope may be a good idea, and have the victim tie it onto himself. This functions as a locator line, as you may need in the case of secondary collapse.

Overcrowding at the edge of a trench is a recipe for disaster to strike again.

Once you have started the shoring operation, remember the situation you are entering. This requires extreme diligence and forethought. Be sure to stay within the limits of the equipment being utilised, and stay mainly inside the protective systems put in place. Rescuers become victims more often than not by overextending themselves in order to help the aided. Now that your shoring is in place you need to start work on the removal of the victim. You must begin by using a thin metal or fibreglass rod to probe the area around the victim. He may believe that he is standing up straight when in fact he will be bent at the waist and not realise it. Using small handtools, cups, pitchers and even your hands, all debris must be removed before you attempt to lift the aided from the trench.

Advanced life support intervention being put to work.

The medical aspects of victims engulfed within a trench are very complicated. If the aided person is deceased, this makes our job slightly easier. We are not in a rush scenario, and hope to use better judgment in getting into the trench and removing the patient. If the victim is alive we need to set aside our feelings and thoughts and put in place our survival system. We need to proceed with caution, care, a lot of thought and most importantly… speed.

This patient needs to be extricated as soon as possible and be transferred to definitive care. Studies show that a person who is engulfed for 20 minutes will have signs and symptoms of crush syndrome. This syndrome occurs when a person has a weight placed on his limbs or the trunk of his body for an extended time. Potassium will build up because the blood flow is constricted and upon release of the blood (extrication) this blood that is potassium-laced will travel through its normal routes and upon entering the heart, lungs and brain will cause unconsciousness and ultimately death within minutes.

Potassium, as we all know, is one of the drugs in a trio of drugs used for lethal injection of criminals.

Having advanced life support capabilities on hand prior to removal is the best thing for a patient who has symptoms of crush syndrome.

Helicopter transport is not out of the question.

Be sure to always have enough resources on hand when dealing with the complexities of a trench rescue. There is no routine trench rescue. The only type of trench rescue that is simple or uncomplicated is the trench rescue that's completed. When dealing with additional resources please remember to "special call" or have a mutual aid contract with some of the following:

- Another trench rescue team to back yours up.
- A vacuum truck to remove debris from the area the victim is trapped (see page 58).
- Advanced life support care.
- Utilities (be it electrical, gas, water or sewer).
- A lumber yard (to support your operations).
- Local equipment rental company.

You may also need a person to handle the public relations end of your incident. Never trust a newspaper to print the truth, be the one explaining all aspects of the event to them.

Remember that we as rescuers did not put these people into the positions that they are in upon our arrival. We depend on each other to perform like champions when we are called to duty and we all go home at the end of the incident. Training scenarios are a must in the technical rescue world and complacency does not ride to work with us, ever!

THE AUTHOR

John Tew has been a New York City Firefighter since 1999. He has been Assigned to Rescue Company 4, Queens, for the past seven years. In addition, he is Chief Instructor for Roco Rescue in Baton Rouge, Louisiana.

John Tew from Rescue Company 4, Queens, after a recent trench job.

A vacuum truck with a RescueVac system can help prevent crush syndrome.