

Work Zone Safety

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Trenching Safety (1926 subpart P)

- **Why Bother?**
 - One of the leading causes of death in construction.
 - More than 100 workers die each year in cave ins.
 - Most cave ins are caused by human error.
 - Because of these reasons, OSHA (both State and Federal) has once again made excavation safety a special empathizes field.
 - Most Federal and state inspectors will stop at all excavations they see.



What is an excavation?

(1926.650)

- Excavation - Any man made cut, cavity, trench, or depression in the earth's surface.
- Trench – A narrow excavation in relation to its length (i.e. the depth is greater than its width and the width is less than 15').
- Cave in – Sudden movement of material into the excavation in large enough quantities that it could entrap, bury, or injure a person.
- Call Dig Safe or local utilities before digging (1926.651b).

Competent Person (1926.650)



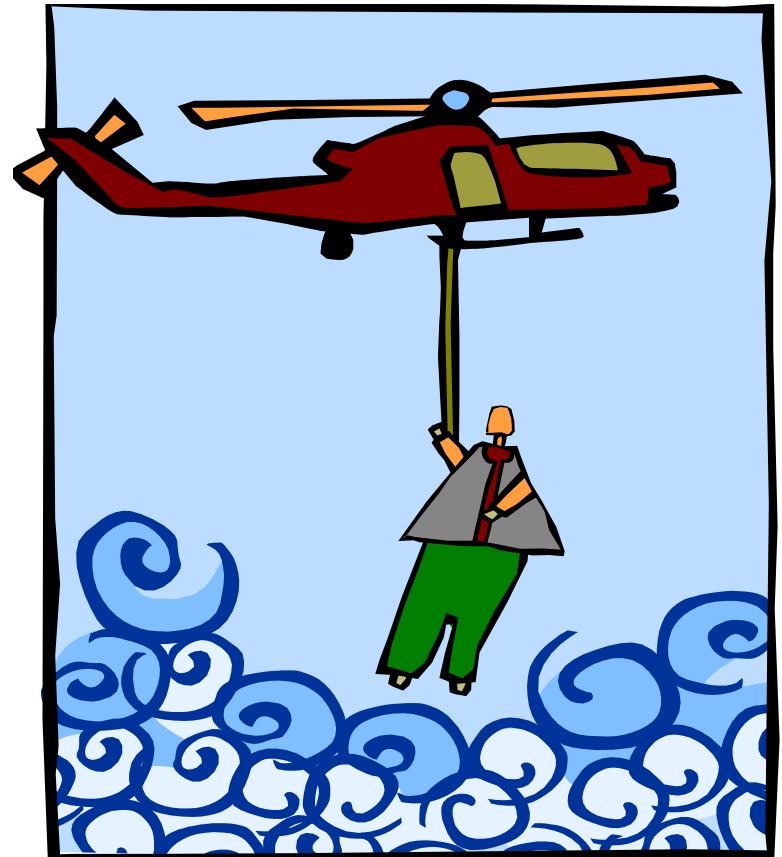
- All excavations must have a competent person onsite.
- Must be capable of identifying existing and predictable hazards.
- Must be trained in Soil Analysis, Protective Systems, and Requirements of the Safety Codes.
- Must have the authority to stop all work if he/she deems necessary, and fix any unsafe conditions.
- Conducts daily inspections on excavations and shoring.
- Determines degree of slope needed, and designs ramps for employees.
- Monitor water removal if needed.

Excavation Rules (1926.651)

- Some form of protective system is needed if the trench is greater than 5' deep.
- No water is allowed to accumulate in the trench. If water is coming in you need to take special precautions. (i.e. pump, extra shoring, competent person evaluation).
- All surface encumbrances that could present a hazard have to be removed or supported.
- All trenches 4 feet deep or more have to have a way of exiting. Stairs, ramps, or ladders must be located so that the employee doesn't have to travel more than 25 feet for egress.
- If there is a possible atmospheric hazard, the trench has to be tested using a gas detector. Possible hazards are, Explosive Gas, Carbon Monoxide, Hydrogen Sulfide, Oxygen Deficient, Oxygen Enriched, etc.
- Spoil pile must be at least 2 feet from the trench edge.

Rescue Equipment (1926.651)

- OSHA says if there is a hazardous atmosphere, you must have rescue immediately available.
- Your local Fire Department may not be able to perform the rescue.
- It is a good idea to inform them of the scope of the work so they know what to expect.
- Make sure your workers know what to do in case of an emergency.



Protective Systems (1926.652)

- Shield – Structures designed to withstand the forces of a cave in (also called trench boxes).
 - Must have tabulated data on the side and be readable.
 - The top of the box must be above normal ground level or 18” above bottom of trench slope.
 - You can block up trench box up to 2 feet as long as box is rated for the full depth of the trench and on a stable base.
 - You must stay within the box at all times.
 - The gap between the edge and the box has to be small enough so that it does not create a hazard.
 - If using an open ended box, make sure the ends are sloped following the soil type.

Shoring – Mechanical system designed to support the sides of the excavation (1926 subpart P).

- If the trench is over 20’ deep, you need an engineer’s approval on the shoring.
- You must build according to OSHA shoring standards. Sheeting must be at least $\frac{3}{4}$ inch hardwood or $1\frac{1}{4}$ inch softwood plywood.

Sloping and Benching (Subpart P appendix A)

- Sloping – Removing material from the sides or ends of an excavation at an angle
- Benching – Removing material from the sides or ends of an excavation in steps.
- Soil type determined by manual tests.
- Type A soil – Previously undisturbed soil.
 - Sloped or benched $\frac{3}{4}$ to 1.

Type B Soil – Previously disturbed soil.

Sloped or benched 1 to 1.

Type C Soil – Previously disturbed soil.

Sloped $1\frac{1}{2}$ to 1.

SENSIT®GOLD 4GAS P/N SG0580CSE-HK

Standard Accessories (included)

Carrying Case • Alkaline Batteries • Charging Kit for rechargeable Batteries (NiMH) • Wrist Strap • Confined Space Probe with Tubing • Sensor Cap • Instruction Manual

Accessories and Replacement Parts

ASG0500	Hot Air Probe Assembly
ASG0130	Bar Hole Probe
ASG0140	Confined Space Probe with Tubing
ASG0500P	Printer
PSG0110	Sensor Cap with O Rings
CSG0580-H	Calibration Kit for 4Gas



MUTCD 2000

Manual on Uniform Traffic Control Devices

- Over the last 10 years and average of 760 people are killed in work zone accidents.
- There are also around 39,000 injuries in these zones yearly.
- U.S. DOT came up with “Manual on Uniform Traffic Control Devices” (MUTCD). This document spells out how companies should protect their workers in roadwork zones. OSHA has now adopted these rules for all work in any roadway.



Requirements Under MUTCD

- **Training** – All workers shall be trained in how to work next to traffic.
- **Barriers** – Keep cars away from workers as much as possible. PPE is always a last resort. You should always attempt to move the traffic away from the employees first (close road, jersey barricades, drums, or cones in that order).
- **Reduced Speed** – Every vehicle that slows down makes you safer.
 - » Make sure we are slowing down when driving thru work zones.
 - » Think out of the box, don't just expect the risk.
 - » Active flaggers, police presence, warning zones, etc.
- **Night projects** - Reflective gear and lots of lights.
 - Do a drive thru to make sure you are not blinding the traffic or confusing them.

Worker Protective clothing

Workers must be in bright, highly visible clothing similar to flaggers. Must be visible thru full range of work motions. If at night or if exposed to speeds of over 25 MPH, retro-reflective strips on clothing is required.

- ANSI/ISEA 107-1999. Set up 3 classes.
- **Class 1** - Traffic less than 25 MPH and good visibility.
 - » This would be the old vests without the reflective stripes.
- **Class 2** – Traffic between 25-50 MPH and/or medium visibility.
 - » This is the class of the new vests that we carry.
- **Class 3** – Traffic greater than 50 MPH and/or bad visibility.
 - » This is usually jackets or pants with vests.

The classification of the protective gear should be listed on the tag.

Work Zone Areas for Traffic Control

- Warning Zone
- Taper Zone
- Buffer Zone
- Work Area
- Taper Zone
- Warning Zone

Not This Way



This Way

Figure 6C-1. Component Parts of a Temporary Traffic Control Zone

Formula

$$L = \frac{ws^2}{60}$$

w = width of offset
 s = speed

Traffic Space allows traffic to pass through the activity area

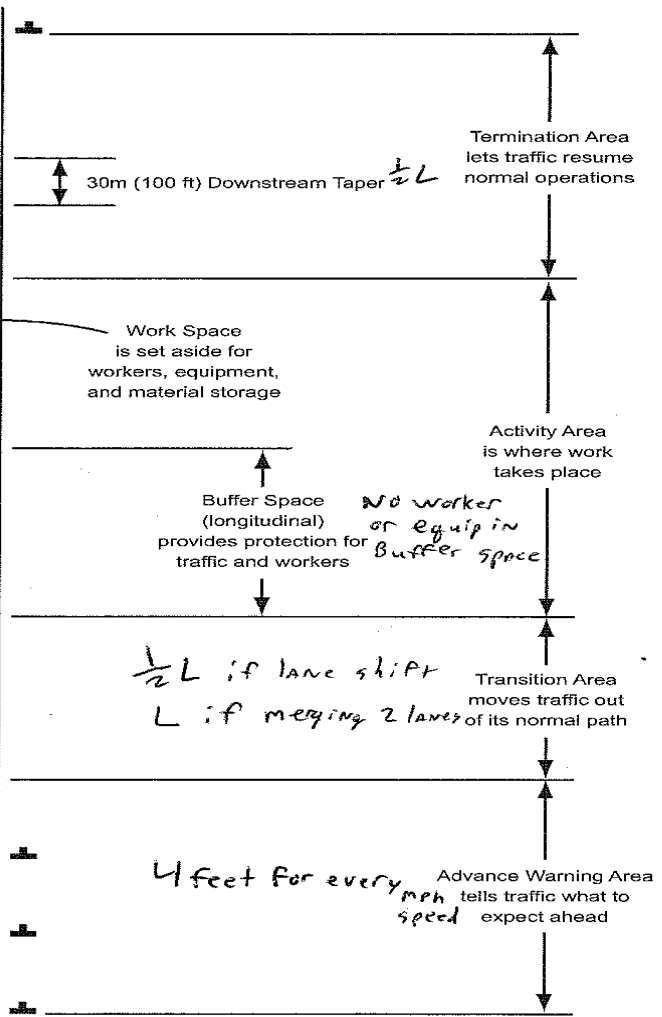
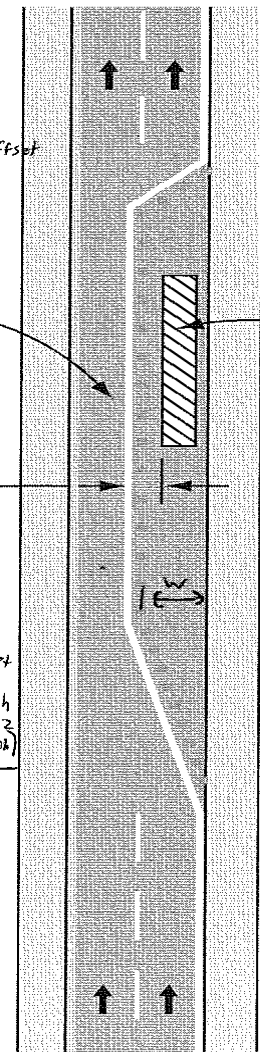
Buffer Space (lateral) provides protection for traffic and workers

Example
 w = 10 ft offset
 speed = 35 mph

$$L = \frac{(10ft)(35mph)^2}{60}$$

$$L = 204$$

$$\frac{1}{2}L = 102 ft$$



Legend

➔ Direction of travel

Safety Shorts

- Public Employers fall under State OSHA programs (Usually part of Dept of Labor)
- Remember OSHA regs are the bare minimum that needs to be done to protect workers. Our main concern should always be safety of ourselves and coworkers.

