OSHA's National Emphasis Program – Trench Works

- **History of the Standards**
- **Results of National Emphasis Programs**
- **Department of Justice/Legal Remedies**
- **Competent Person Requirements**
- **OSHA Standard**
- **OSHA-Compliant Protective System Options**

Speaker Bio

- Bruce Magee
- Region Product Development Manager
- United Rentals
- With 39 years in the rental industry, and the last 25 years in Trench Safety, Bruce has delivered 380+ Competent Person classes. He has presented on Trench Safety/Confined Space Safety requirements to 100+ engineering conferences, and trained Construction Safety Professionals and OSHA Compliance Officers across North America.
- Personal Social Handles
  - LinkedIn: www.linkedin.com/in/brucemagee
  - Twitter: @BruceMagee11

Trench Safety

CPL 2.69 Original Special Emphasis Program

OSHA CPL 2.69 Special Emphasis Program

- **National Emphasis Directive for Trench And Excavation Enforcement**
  - In place September 1985
- **Began as regional program, became a nation[illegible] program**
  - Continuing incident reports warrant[illegible] [illegible]
  - Acknowledgement of the dange[illegible] [illegible] Work
  - Cites common violat[illegible] [illegible] for non-compliance
  - OSHA's experience [illegible] compliance despite years of enforcement effort
- **All [illegible] are instructed to watch for trenching or excavation sites**
  - [illegible] on jobsite co[illegible]
  - Record contract information
  - Contact Area Office supervisor if an inspection is required
  - OSHA's cites violations to the Trench Standard very frequently
  - In 2010, citations for failure to provide appropriate protective systems ranked as the seventh highest $ penalty per occurrence

SUSPENDED
After 33 years

OSHA Agency Priority

Worker Safety: Reduce Trenching and Excavation Hazards

Goal Leader: Loren Sweatt, Deputy Assistant Secretary for Occupational Safety and Health

Goal Statement: By September 30, 2019, increase trenching and excavation hazards abated by 10% compared to FY2017 through inspections and compliance assistance at workplaces covered by the Occupational Safety and Health Administration.

DOL Strategy

- Target trench hazard workplaces, work with OSHA Outreach
- Work with industry associations and utilities
- Track and publish updates on abated hazards

OSHA Agency Priority – Replacement Instruction

OSHA INSTRUCTION

U.S. DEPARTMENT OF LABOR — Occupational Safety and Health Administration

DIRECTIVE NUMBER: CPL-02-00-161	EFFECTIVE DATE: 10/1/2018
SUBJECT: National Emphasis Program on Trenching and Excavation	

ABSTRACT

Purpose: This instruction, *National Emphasis Program on Trenching and Excavation*, describes policies and procedures for continued implementation of an OSHA National Emphasis Program (NEP) to identify and to reduce hazards which are causing or likely to cause serious injuries and fatalities during trenching and excavation operations.

Scope: This instruction applies OSHA-wide.

References: 29 CFR 1926, Subpart P – Excavations
CPL 02-00-160, Field Operations Manual (FOM), August 2, 2016.

Cancellations: This instruction will supersede CPL 02-00-069, Special Emphasis: Trenching and Excavation, September 19, 1985, 100 days after this NEP becomes effective. Enforcement under CPL 02-00-069 shall continue during the pre-enforcement outreach period in Section XI of this instruction.

State Impact: Notice of Intent and Adoption required. See paragraph VII.

Action Offices: National, Regional, Area, and State Plan Offices.

Originating Office: Directorate of Construction (DOC).

Contact: Director, Office of Construction Services
200 Constitution Avenue, NW, Room N3468
Washington, DC 20210
Phone (202) 693-2020

Results

Worker Safety: Reduce Trenching and Excavation Hazards

Goal Leader: Loren Sweatt, Deputy Assistant Secretary for Occupational Safety and Health

Goal Statement: By September 30, 2019, reduce trenching and excavation hazards abated by 10% compared to FY2017 through inspection and compliance assistance at worksites covered by the Occupational Safety and Health Administration.

Goal Strategy

- Target trench hazard workplaces; work with OSHA Outreach
- Work with industry associations and utilities
- Track and publish updates on abated hazards

11 Fatalities in April 2019

Specific Issues In Trench Work

- **On The Trench Side…**
  - Same Rules, New Emphasis Program, Lack Of Compliance
  - Failure To Properly Evaluate Soil Types
  - Failure To Use An OSHA-Compliant Protective System
  - Disappointing Results

- **Drivers Of These Results**
  - Improperly Trained Competent Persons

What Is A Trench and Excavation Competent Person?

- **From the National Safety Council**
  - Not intended to be a compliment to an employee
  - Not intended to be an arbitrarily assigned title
  - It is a designated individual with legal obligations

- **One capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them**

Trench Competent Person Requirements

- Must be trained in, and be knowledgeable of, the requirements of the standard
- Must be knowledgeable of soil analysis
- Must be knowledgeable of acceptable protective system options
- Must be knowledgeable of the 12 specific requirements for safety around the trench

Shallow Trenches Can Be Deadly

2 workers dead after Hoover drainage ditch collapse

Judgment issued in Perry trench collapse lawsuit

Photos

CONTRIBUTED

trench graphic.jpg

Yellow Pages

Tools

Print

ShareThis

By BRENT ENGEL
Hannibal Courier-Post
Posted Mar 24, 2010 @ 05:41 PM

Perry, MO – The family of a Perry city worker who was killed in a trench collapse two years ago has been awarded more than $6 million in a wrongful death lawsuit.

Twenty-nine-year-old Timothy C. Epperson and another Perry city worker, 19-year-old Tony Painter, were fixing a sewer line a block north of the downtown area when the sides of the trench collapsed about 7 p.m. Feb. 19, 2008.

Epperson's widow, Amy, filed the lawsuit on behalf of the couple's three sons, Bret, Gaven and Ty. His parents, Donald and Mary Epperson, joined their daughter-in-law and others in testifying at a hearing earlier this month.

In his ruling, Circuit Judge Robert M. Clayton II said Perry City Superintendent Donald Lee Huff "breached a duty of care" to Epperson and "committed an affirmative negligent act" by not taking the proper safety precautions at the trench site.

Clayton wrote that Huff failed to "take action despite his knowledge of the danger of a cave-in." The trench was not reinforced or sloped.

Branson Wood, a Hannibal attorney who represented the Eppersons, said the family's "loss was catastrophic" and that the "judgment was fair."

Perry City Attorney Joseph Brannon said he had not seen a copy of the judgment and reserved comment until he had reviewed it.

A resident who lived nearby helped pull Painter to safety, but rescuers weren't able to reach Epperson for about 25 minutes. He was pronounced dead at Hannibal Regional Hospital later that night.

Wood had asked at the hearing that Clayton consider a monetary judgment of $5 million to $10 million. Brannon told the judge during the hearing that the city conceded the accident was a tragedy, but asked that the damages be limited to $1 million to $3 million.

The total amount of the monetary judgment was $6,277,700. After attorney's fees, Amy Epperson will get half and the couple's boys will each receive 11.67 percent. Epperson's parents were awarded 7.5 percent each.

Wood said the next step is to set up a meeting to determine whether there is insurance coverage that will pay on behalf of the defendant.

Harco Construction found guilty of manslaughter, criminally negligent homicide in fatal 2015 Meatpacking District collapse

Lawyers for Harco Construction LLC look dejected after a judge declared the company guilty of manslaughter Friday. (JEFFERSON SIEGEL/NEW YORK DAILY NEWS)

November 10, 2016 | 4:30 PM

Construction company foreman convicted in worker's death

November 10, 2016 | 4:30 PM

Foreman Declined to Remove his Workers from Illegal Trench Despite Repeated Warnings on Day of Fatal Collapse

Manhattan District Attorney Cyrus R. Vance, Jr., today announced the trial conviction of Wilmer Cueva, 51, the foreman of an excavation subcontractor, for ignoring warnings about unlawfully inadequate safety precautions at an active excavation site that he managed, which caused the death of 22-year-old worker Carlos Moncayo, and endangered several other construction workers. The defendant was convicted by a New York State Supreme Court jury of Criminally Negligent Homicide and Reckless Endangerment, and is expected to be sentenced on December 15, 2016.

As proven at trial, CUEVA was employed as an on-site foreman by SKY MATERIALS ("SKY"), an excavation subcontractor hired to manage construction at 9-19 Ninth Avenue in the Meatpacking District. As required by the New York City Building Code and the Occupational Safety & Health Administration, excavations deeper than five feet must be secured—

Boston drain firm indicted in fatal trench collapse

MATTHEW J. LEE/GLOBE STAFF

Boston Firefighters and emergency personal worked to rescue construction workers that were trapped in a trench.

By Nestor Ramos, Kay Lazar and Travis Andersen | GLOBE STAFF FEBRUARY 08, 2017

A Boston drain firm and its owner flouted safety regulations that could have saved two employees who died when a trench collapsed and filled with water in October, prosecutors said Wednesday. Then, the owner and company sought to cover up their inaction by forging documents to suggest they'd taken required safety classes, officials said.

Judge sentences drain company owner to 2 years for South End trench collapse deaths

By Travis Andersen Globe Staff, December 5, 2019, 9:37 a.m.

Kevin Otto left Suffolk Superior Court after being sentenced to two years in jail. LANE TURNER/GLOBE STAFF

A Suffolk Superior Court judge on Thursday sentenced a drain company owner to two years in jail for failing to take safety precautions at a job site where a terrifying trench collapse killed two of his workers in Boston in 2016.

As relatives of the victims, Kelvin Mattocks and Robert Higgins, looked on, and over prosecutors' objections, Judge Mitchell H. Kaplan permitted Kevin L. Otto, 45, to remain free for at least the next several weeks while the defense files a motion to reconsider the verdict.

Otto was convicted during an October bench trial of two counts of involuntary manslaughter and one count of witness intimidation. His company, Atlantic Drain Service, was found guilty of the same counts.

Otto was at the job site on Dartmouth Street in the South End on the afternoon of Oct. 21, 2016, when a 14-foot

MOST POPULAR ON BOSTONGLOBE.COM

1. Tufts to remove Sackler name from buildings, programs
2. Globe TV critic Matthew Gilbert's top 10 shows of 2019
3. Sheriff's e-mails show level of White House loyalty
4. Raising a black son in America
5. Local Swissbakers cafe chain abruptly shuts down operations
6. Thoughts on Dwight Evans's Hall of Fame chances, and other matters
7. 'Don't mess with me.' Pelosi rebukes reporter who asked if she 'hates' Trump
8. Obamas reportedly buy Martha's Vineyard waterfront estate for $11.75 million
9. Pelosi announces House to draft articles of impeachment against Trump
10. If Peloton is canceled, here are some gifts that won't get you in trouble on Twitter

VIEWS FROM OUR COLUMNISTS

SHIRLEY LEUNG
Former interim Boston schools chief to lead early education provider

JOAN VENNOCHI
Is the Orange Line our next existential threat?

Baltimore suspends work with contractor after death of man in trench, citing 'life safety concerns'

State officials are investigating the death of Kyle Hancock in the trench collapse in the 2000 block of Sinclair Lane.

By Nicholas Bogel-Burroughs and Yvonne Wenger · Contact Reporters
The Baltimore Sun

JUNE 11, 2018, 7:00 PM

Baltimore officials suspended all of a contractor's work with the city in response to the death last week of a 20-year-old man who was smothered when the trench where he was working collapsed.

In a letter to R.F. Warder Inc., the city's purchasing agent cited "life safety concerns" in her decision to suspend the White Marsh-based company's work on two contracts worth more than $16 million.

OSHA CPL 2.87 Inspection Procedures

- Inspection procedures on website
- Lists specific inspection points for the Compliance Safety and Health Officer (CSHO)
- Repeats minimum training requirements for Competent Person
- In appropriate cases, OSHA may refer deficient engineering designs to the State Boards for Professional Engineers

Directives

CPL 02-00-087 - CPL 2.87 - Inspection Procedures for Enforcing the Excavation Standard, 29 CFR 1926, Subpart P

Directives - Table of Contents

- **Record Type:** Instruction
- **Directive Number:** CPL 02-00-087
- **Old Directive Number:** CPL 2.87
- **Title:** Inspection Procedures for Enforcing the Excavation Standard, 29 CFR 1926, Subpart P
- **Information Date:** 02/20/1990
- **Standard Number:** 1926 Subpart P; 1926.650; 1926.651; 1926.652

OSHA Instruction CPL 2.87 FEB 20, 1990 Directorate of Compliance Programs

SUBJECT: Inspection Procedures for Enforcing the Excavation Standards - 29 CFR 1926, Subpart P.

A. Purpose. This instruction establishes inspection procedures and provides clarification to ensure uniform enforcement of the Excavation Standards.

B. Scope. This instruction applies OSHA-wide.

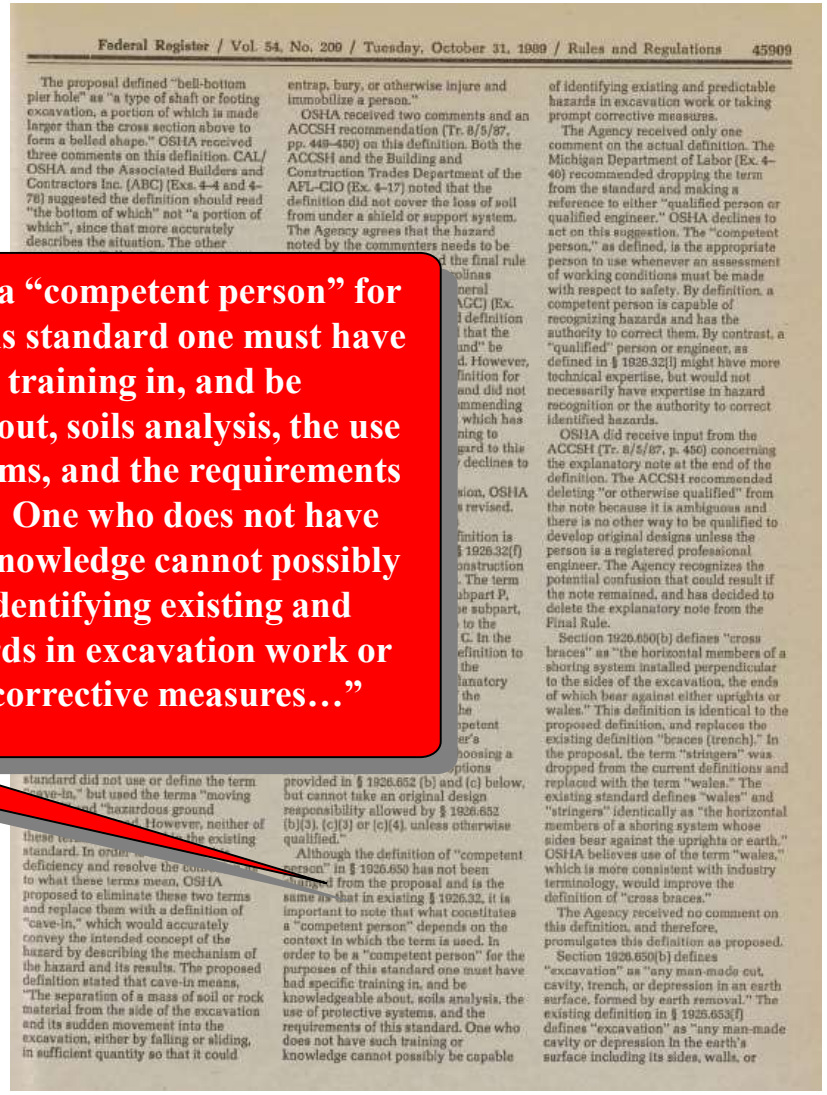
C. References.

1. Construction Safety and Health Standards, Subpart P., 29 CFR 1926.650, 651, and 652.

The Competent Person Defined

The competent person is defined as one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees and who has the authorization to take prompt corrective measures to eliminate them.

Requirements for Competent Person Training



Federal Register / Vol. 54, No. 209 / Tuesday, October 31, 1989 / Rules and Regulations 45909

The proposal defined "bell-bottom pier hole" as "a type of shaft or footing excavation, a portion of which is made larger than the cross section above to form a belled shape." OSHA received three comments on this definition. CAL/OSHA and the Associated Builders and Contractors Inc. (ABC) (Exs. 4-4 and 4-78) suggested the definition should read "the bottom of which" not "a portion of which", since that more accurately describes the situation. The other

entrap, bury, or otherwise injure and immobilize a person."

OSHA received two comments and an ACCSH recommendation (Tr. 8/5/87, pp. 449-450) on this definition. Both the ACCSH and the Building and Construction Trades Department of the AFL-CIO (Ex. 4-17) noted that the definition did not cover the loss of soil from under a shield or support system. The Agency agrees that the hazard noted by the commenters needs to be

standard did not use or define the term "cave-in," but used the terms "moving ... and "hazardous ground ... However, neither of ... the existing standard. In order ... deficiency and resolve the ... to what these terms mean, OSHA proposed to eliminate these two terms and replace them with a definition of "cave-in," which would accurately convey the intended concept of the hazard by describing the mechanism of the hazard and its results. The proposed definition stated that cave-in means, "The separation of a mass of soil or rock material from the side of the excavation and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could

provided in § 1926.652 (b) and (c) below, but cannot take an original design responsibility allowed by § 1926.652 (b)(3), (c)(3) or (c)(4), unless otherwise qualified."

Although the definition of "competent person" in § 1926.650 has not been ... from the proposal and is the same as that in existing § 1926.32, it is important to note that what constitutes a "competent person" depends on the context in which the term is used. In order to be a "competent person" for the purposes of this standard one must have had specific training in, and be knowledgeable about, soils analysis, the use of protective systems, and the requirements of this standard. One who does not have such training or knowledge cannot possibly be capable

of identifying existing and predictable hazards in excavation work or taking prompt corrective measures.

The Agency received only one comment on the actual definition. The Michigan Department of Labor (Ex. 4-40) recommended dropping the term from the standard and making a reference to either "qualified person or qualified engineer." OSHA declines to act on this suggestion. The "competent person," as defined, is the appropriate person to use whenever an assessment of working conditions must be made with respect to safety. By definition, a competent person is capable of recognizing hazards and has the authority to correct them. By contrast, a "qualified" person or engineer, as defined in § 1926.32(l) might have more technical expertise, but would not necessarily have expertise in hazard recognition or the authority to correct identified hazards.

OSHA did receive input from the ACCSH (Tr. 8/5/87, p. 456) concerning the explanatory note at the end of the definition. The ACCSH recommended deleting "or otherwise qualified" from the note because it is ambiguous and there is no other way to be qualified to develop original designs unless the person is a registered professional engineer. The Agency recognizes the potential confusion that could result if the note remained, and has decided to delete the explanatory note from the Final Rule.

Section 1926.650(b) defines "cross braces" as "the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales." This definition is identical to the proposed definition, and replaces the existing definition "braces (trench)." In the proposal, the term "stringers" was dropped from the current definitions and replaced with the term "wales." The existing standard defines "wales" and "stringers" identically as "the horizontal members of a shoring system whose sides bear against the uprights or earth." OSHA believes use of the term "wales," which is more consistent with industry terminology, would improve the definition of "cross braces."

The Agency received no comment on this definition, and therefore, promulgates this definition as proposed.

Section 1926.650(b) defines "excavation" as "any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal." The existing definition in § 1926.653(f) defines "excavation" as "any man-made cavity or depression in the earth's surface including its sides, walls, or

"…In order to be a "competent person" for the purposes of this standard one must have had specific training in, and be knowledgeable about, soils analysis, the use of protective systems, and the requirements of this standard. One who does not have such training or knowledge cannot possibly be capable of identifying existing and predictable hazards in excavation work or taking prompt corrective measures…"

OSHA 1926.650 - .652

UNITED STATES DEPARTMENT OF LABOR

Occupational Safety and Health Administration

CONTACT US FAQ A TO Z INDEX ENGLISH ESPAÑOL

OSHA STANDARDS TOPICS HELP AND RESOURCES SEARCH OSHA

By Standard Number / 1926.650 - Scope, application, and definitions applicable to this subpart.

- **Part Number:** 1926
- **Part Number Title:** Safety and Health Regulations for Construction
- **Subpart:** 1926 Subpart P
- **Subpart Title:** Excavations
- **Standard Number:** 1926.650
- **Title:** Scope, application, and definitions applicable to this subpart.
- **GPO Source:** e-CFR

1926.650(a)

Scope and application. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

1926.650(b)

Definitions applicable to this subpart.

"Accepted engineering practices" means those requirements which are compatible with standards of practice required by a registered professional engineer.

"Aluminum Hydraulic Shoring" means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

"Bell-bottom pier hole" means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

"Benching (Benching system)" means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

"Cave-in" means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or other wise injure and immobilize a person.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

"Cross braces" mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Trenching and Excavation Safety

U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 2226-10R 2015

U.S. Department of Labor

Subpart P 29 CFR 1926.650

Definitions applicable to this Subpart, including

- **Sloping**
- **Benching**
- **Shoring**
- **Shielding**
- **Protective Systems**
- **Registered Professional Engineer**
- **Manufacturer’s Tabulated Data**

Subpart P 29 CFR 1926.651

12 Specific Requirements

- Surface Encumbrances
- Underground Installations
- Access and Egress
- Exposure to Vehicular Traffic
- Exposure to Falling Loads
- Warning System for Mobile Equipment
- Hazardous Atmospheres
- Hazards Associated with Water Accumulation
- Stability of Adjacent Structures
- Protection From Loose Rock or Soil
- Inspections
- Fall Protection

Subpart P 29 CFR 1926.652

Requirements for Protective Systems

- Requires system use at depths of 5’ or more
- Allows sloping and benching systems, per Appendix B
- Allows support systems, shields systems, and other support systems, per Appendices C (Timber), D (Aluminum Hydraulic) , and E (Alternatives to Timber)
- Materials and equipment must be free from defect
- Installation and removal must be done from a safe vantage point
- Provide protection for employees working on slopes
- Allows for shield systems usage, with limitations

Soils, for the Competent Person

- **OSHA Developed soil classification system**
  - Stable Rock, Types A, B and C
- **Requires soil classification by the Competent Person**
  - Minimum of one visual and one manual test
- **Provided maximum equivalent fluid pressures (EFP), or lateral earth pressures (LEP), for each soil type (found in Timber Appendix C)**
- **Soil type defined by physical characteristics and environment factors**
- **Physical Characteristics**
  - Stable Rock, Cemented Soils, Cohesive Soils, Granular Soil, or Loams
- **Environmental Factors**
  - Surcharge Loads, Moisture Content, Weather, Time, Flooding and Pumping, Previously Disturbed Soil, And Vibrations Potentially Downgrade Soil Classifications

Soil Testing

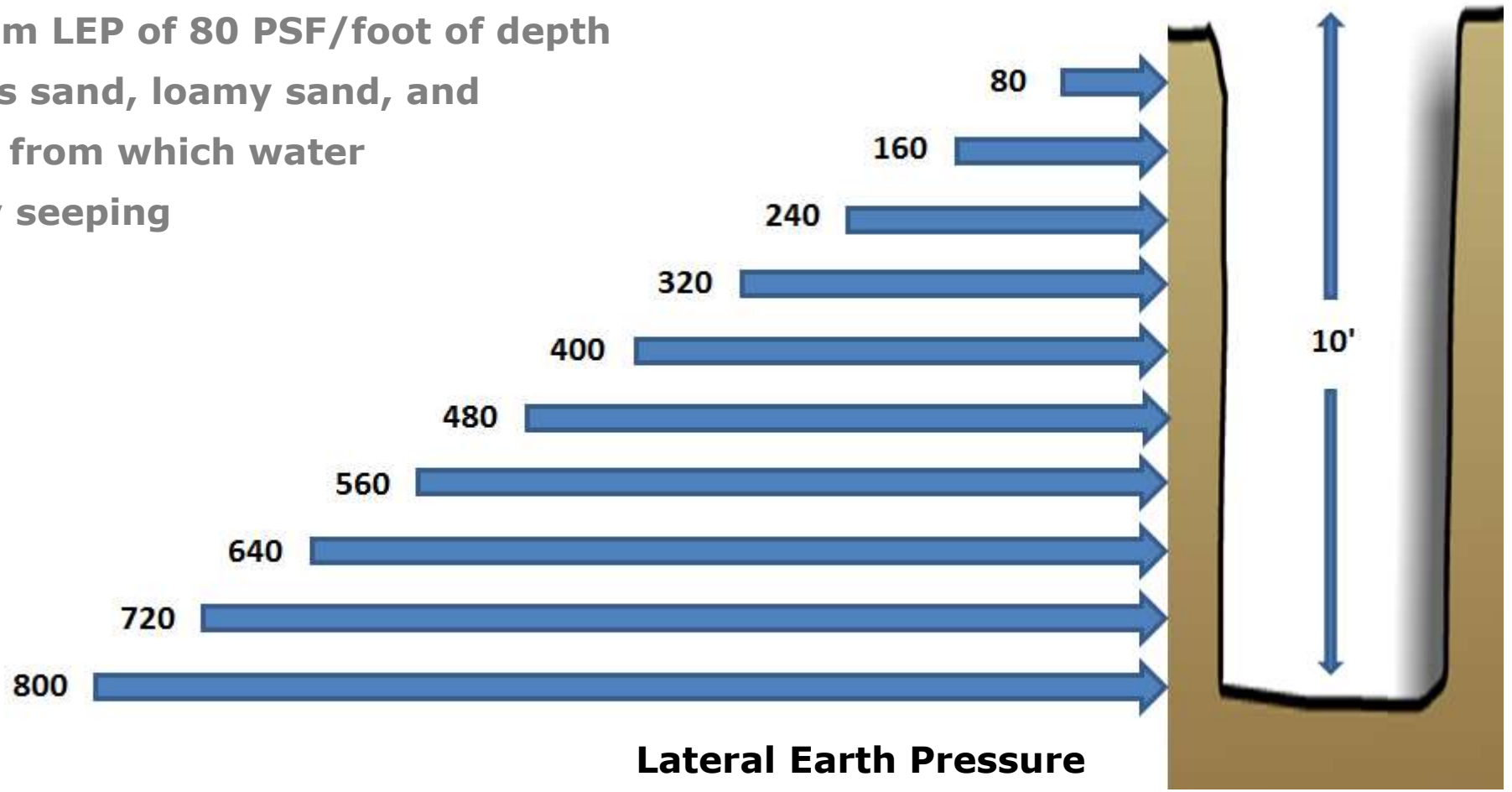
- **Accepted visual testing**
  - Granular vs. cohesive appearance
  - Layered systems
  - Fissures
  - Vibration sources
  - Evidence of prior disturbance
  - Water
- **Accepted manual testing**
  - Plasticity
  - Dry strength
  - Thumb penetration
  - Pocket penetrometer
  - Hand-operated shearvane

Unconfined Compressive Strength (UCS)

- **The load per unit area at which a soil will fail in compression**
- **Determined through**
  - Lab testing
  - Pocket penetrometer
  - Thumb penetration

Soil Type C

- Cohesive or granular
- UCS of 0 to .5 TSF in cohesive soil
- Maximum LEP of 80 PSF/foot of depth
- Includes sand, loamy sand, and any soil from which water is freely seeping

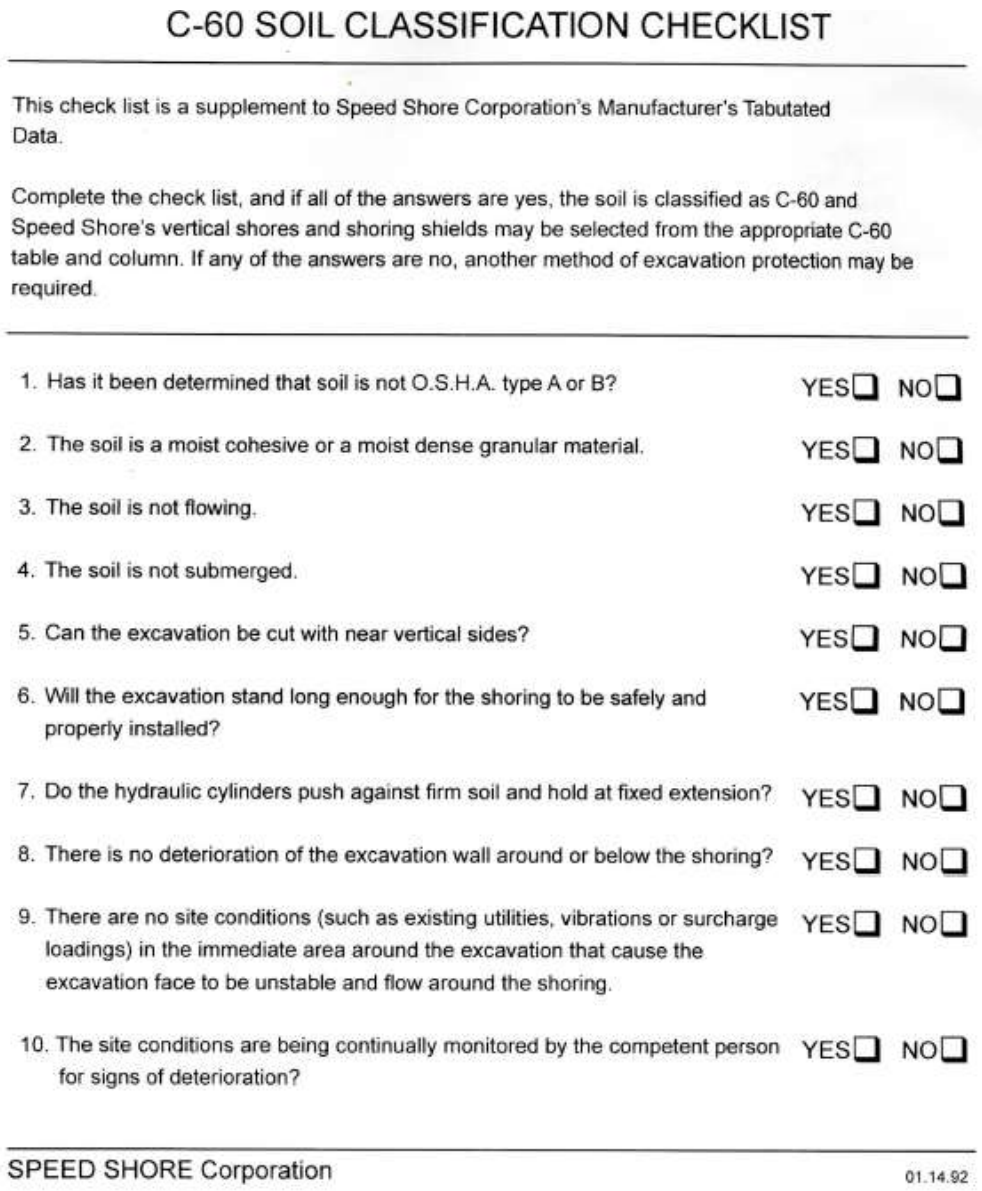


Soil Type C-60, and why it is important

- Sub-grade of Type C soil
- Moist, dense cohesive or moist, dense granular
- Engineered soil type
- Neither Type A nor B, is not flowing, and is not submerged
- Maximum LEP of 60 PSF/foot of depth
- Sufficient stand time for vertical shore installation
- Some manufacturers may not allow their shields to be used in soil worse than C-60

C-60 Classification and Checklist

- Multi-page document
- Includes definition
- References the National Bureau of Standards (NIST)
- Defines the purpose of the designation
- Stamped by RPE



C-60 SOIL CLASSIFICATION CHECKLIST

This check list is a supplement to Speed Shore Corporation's Manufacturer's Tabutated Data.

Complete the check list, and if all of the answers are yes, the soil is classified as C-60 and Speed Shore's vertical shores and shoring shields may be selected from the appropriate C-60 table and column. If any of the answers are no, another method of excavation protection may be required.

1. Has it been determined that soil is not O.S.H.A. type A or B? YES❑ NO❑
2. The soil is a moist cohesive or a moist dense granular material. YES❑ NO❑
3. The soil is not flowing. YES❑ NO❑
4. The soil is not submerged. YES❑ NO❑
5. Can the excavation be cut with near vertical sides? YES❑ NO❑
6. Will the excavation stand long enough for the shoring to be safely and properly installed? YES❑ NO❑
7. Do the hydraulic cylinders push against firm soil and hold at fixed extension? YES❑ NO❑
8. There is no deterioration of the excavation wall around or below the shoring? YES❑ NO❑
9. There are no site conditions (such as existing utilities, vibrations or surcharge loadings) in the immediate area around the excavation that cause the excavation face to be unstable and flow around the shoring. YES❑ NO❑
10. The site conditions are being continually monitored by the competent person for signs of deterioration? YES❑ NO❑

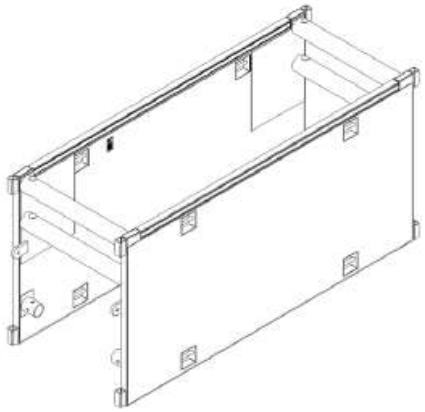
SPEED SHORE Corporation 01.14.92

Manufacturer's Tabulated Data

TABULATED DATA

STEEL TRENCH SHIELDS

"DW" MODELS



April 16, 2009

SPEED SHORE CORPORATION
3330 S. SAM HOUSTON PKWY E. HOUSTON, TEXAS 77047
Tel: (713) 943-0750 U.S.A. Toll Free: (800) 231-6662 Fax: (713) 943-8483

TABLE TS-2

"DW" MODELS
DOUBLE SKIN PLATE WALLS

MODEL	CAPACITY P.S.F.	MAXIMUM DEPTH RATING FOR SOIL TYPES FEET					VERTICAL PIPE CLEARANCE INCHES	WEIGHT APPX. POUNDS
		A-25	B-35	B-45	C-60	C-80		
TS-0420DW8	1,969	50	50	44	34	26	20	6,300
TS-0424DW8	1,343	50	38	30	23	18	20	7,525
TS-0428DW8	975	38	28	22	17	13	20	8,500
TS-0430DW8	845	33	24	19	15	12	20	9,075
TS-0432DW8	740	29	21	17	13	10	20	9,550
TS-0620DW8	1,935	50	50	44	34	26	42	9,200
TS-0624DW8	1,320	50	39	31	24	19	42	11,000
TS-0628DW8	1,086	44	32	26	20	16	42	13,000
TS-0630DW8	941	38	28	22	17	14	42	13,900
TS-0632DW8	824	33	24	20	16	12	42	14,850
TS-0820DW8	1,874	50	50	44	34	27	65	11,400
TS-0824DW8	1,279	50	38	31	24	19	65	13,250
TS-0828DW8	1,268	50	38	31	24	19	65	18,675
TS-0830DW8	1,161	48	35	28	22	18	65	19,950
TS-0832DW8	962	40	29	24	19	15	65	20,850
TS-1020DW8	1,347	50	41	33	26	21	86	14,200
TS-1024DW8	1,123	47	35	28	23	18	86	16,850
TS-1028DW8	962	41	30	25	20	16	86	18,900
TS-1030DW8	957	40	30	25	20	16	86	21,640
TS-1032DW8	897	38	29	23	19	15	86	24,490

Notes
(1) If a specific model DW trench shield is not shown in Table TS-1 or TS-2, the competent person must refer to the trench shield certification to determine capacity and working depths. All other aspects of this tabulated data applies to any DW shield not shown in Tables TS-1 or TS-2.
(2) Weights are approximate.
(3) Standard spreader sizes for DW trench shields as shown in Table TS-1 or TS-2 are 8" schedule 80 pipe, maximum length of 20'. For models not listed or custom shields, please see the serialized certification for each shield for spreader requirements.

Manufacturer's Tabulated Data – Limits of Vertical Shores

TABULATED DATA

VERTICAL SHORES

January 1, 1995

SPEED SHORE CORPORATION

3330 S. SAM HOUSTON PKWY E. HOUSTON, TEXAS 77047
Tel: (713) 943-0750 U.S.A. Toll Free: (800) 231-6662 Fax: (713) 943-8483

7.0 EXAMPLE TO ILLUSTRATE THE USE OF TABLES VS-1, VS-2 and VS-3:

Problem: Design a trench safety system using Speed Shore Vertical Shores for an excavation 8 feet deep and 4 feet wide in O.S.H.A. Type B soil.

Study tables: Select Table VS-2 for Type B soil. Look in the column "Depth of Excavation" on line 0 to 15 feet. Next, read across and find under "Hydraulic Cylinders", "Maximum Horizontal Spacing" at 8 feet and "Maximum Vertical Spacing" at 4 feet. Next, locate the hydraulic cylinder size under "Width of Excavation", 0 to 8 feet": 2 inch diameter. Finally, under "Sheeting", Notes 2 and 3 apply.

Conclusion: Install Speed Shore Vertical Shores with 2 inch diameter cylinders at 8 feet intervals with or without plywood sheeting, depending upon the ***competent person's*** judgment of the raveling or sloughing of the excavation face. (See Notes 2 and 3).

TABLE VS-1 TYPE "A" SOIL

Depth of Excavation FEET	HYDRAULIC CYLINDERS					Sheeting (Note 3)
	Maximum Horizontal Spacing *(FEET)*	Maximum Vertical Spacing (Note 6) *FEET*	Width of Excavation *FEET*			
			0 to 8	8 to 12	12 to 15	
0 to 15	8	4	2" dia.	2" dia.	2" dia. (Note 1)	(Note 2)
0 to 25	8	4	2" dia.	2" dia. (Note 1)	2" dia. (Note 1)	(Note 2)

TABLE VS-2 TYPE "B" SOIL

Depth of Excavation FEET	HYDRAULIC CYLINDERS					Sheeting (Note 3)
	Maximum Horizontal Spacing *(FEET)*	Maximum Vertical Spacing (Note 6) *FEET*	Width of Excavation *FEET*			
			0 to 8	8 to 12	12 to 15	
0 to 10	8	4	2" dia.	2" dia.	2" dia. (Note 1)	(Note 2)
0 to 20	6	4	2" dia.	2" dia. (Note 1)	2" dia. (Note 1)	(Note 2)
0 to 25	5	4	2" dia.	2" dia. (Note 1)	2" dia. (Note 1)	(Note 7)

TABLE VS-3 TYPE "C-60" SOIL (See 3.3 for definition of C-60 Soil)

Depth of Excavation FEET	HYDRAULIC CYLINDERS					Sheeting (Note 4)
	Maximum Horizontal Spacing *(FEET)*	Maximum Vertical Spacing (Note 6) *FEET*	Width of Excavation *FEET*			
			0 to 8	8 to 12	12 to 15	
0 to 10	6 (Note 5)	4	2" dia	2" dia	2" dia. (Note 1)	(Note 2)
0 to 20	4	4	2" dia	2" dia. (Note 1)	2" dia. (Note 1)	(Note 7)
0 to 25	4	4	2" dia	2" dia. (Note 1)	N/A	(Note 7)

SPEED SHORE CORPORATION

OSHA Compliant Protective Systems

OSHA Charts and Tables

1. Sloping and Benching
   Appendix B

2. Timber Shoring
   Appendix C

3. Aluminum Hydraulics
   Appendix D

Registered Professional Engineer

4. Manufacturer's Tabulated Data

5. Site-Specific Engineering

OSHA Charts valid only to 20'

Any deviation to OSHA Charts or Tabulated Data requires written PE approval regardless of depth.

Work safely. Thank you.

Bruce Magee
bmagee@ur.com
225-938-6228

UR Trench Safety
Arlington, TX
817-379-7233