

Trenching and Excavation Safety



Trenching and Excavation Safety

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

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Introduction

Excavation and trenching work has a high potential for injury and death. The Occupational Safety and Health Administration (OSHA) excavates and trenches, 29 Code of Federal Regulations (CFR) Part 1926, Subpart P, covers excavation and trenching work. This booklet highlights the safety hazards associated with excavation and trenching work.

What is the difference between an excavation and a trench?

OSHA defines an excavation as a hole or trench, cut into the earth, the face of which is exposed to the atmosphere. A trench is a narrow excavation (usually less than 12 feet wide) that is deep enough to require shoring or shoring. A trench is a narrow excavation (usually less than 12 feet wide) that is deep enough to require shoring or shoring.

What are the dangers of trenching and excavation operations?

The dangers of excavation and trenching work include cave-ins, falling, and being struck by equipment. Cave-ins are the most common and dangerous hazard. They can occur when the soil or rock surrounding the excavation collapses. Falling is another major hazard. Workers can fall into the excavation or trench. Being struck by equipment is also a common hazard. Workers can be struck by the backhoe, shovel, or other equipment used in excavation and trenching work.

What do the OSHA Excavation standards cover, and how do they protect workers?

The excavation standards cover a wide range of hazards, including cave-ins, falling, and being struck by equipment. The standards also cover the design and construction of excavation and trenching operations. The standards are designed to protect workers from the hazards of excavation and trenching work.

What are the soil classification categories?

S e f h e c l i a c e e h d e i e d d e h e
E c a v a i a d a d e i e a c e e e c l a i f
i l a d c k d e i a :

- Stable rock;
- Type A soil;
- Type B soil; or
- Type C soil.

See Appendix A to Subpart P of Part 1926 – Soil Classification.

Stable Rock Na al lid i e al a e ha ca be
e cava ed i h ve ical ide a d e ai i ac hile e ed.

Type A C he ive il i ha c ed c e ive
e gh f 1.5 e a ef (f) (144 kPa) g ea e .
E a le i cl de: cla , il cla , a d cla , a d cla. l a .
Ce ai c dii ecl de ilf bei g cla i ed a T e
A.F e a le, ili T e Aifi i ed ha bee
evi l di bed. See *Appendix A to Subpart P of Part 1926,*
paragraph (b) – Definitions (Type A), f a de ailed de i i f
T e A il.

Type B I cl de c he ive il i ha c ed c e ive
e gh g ea e ha 0.5 f (48 kPa) b le ha 1.5 f (144
kPa) a dg a la c he i le il (cha a g la g avel,
i ila c hed ck, il , il la , a d la , a d, i e
ca e , il cla la a d a d cla la). See *Appendix A to
Subpart P of Part 1926, paragraph (b) — Definitions (Type B)*, f
a de ailed de i f *Type B* il.

Type C C he ive il i ha c edc e ive
e gh f0.5 f(48 kPa) le ,g a la il (i cl di g
g avel, a d,a d l a a d), b e ged il il f
hich a e i feel ee i g, b e ged ck ha i
able, a e ial i a l ed, la e ed e he e he la e
di i he e cava i i ha l e ff h i al e
ve ical (4H:1V) ee e . See Appendix A to Subpart P of
Part 1926, paragraph (b) — Definitions (Type C), f a de ailed
de i fT eC il.

k a c ec i ake i h i g l i g l
 d he e a i , add he c f he jec , a d ake
 a cave-i he e cava i fail e e likel .

What safety factors should be considered when bidding on a job?

Bef e e a i g a bid, e l e h l d k a cha
 ible ab he j b i e a d he a e ial he ill eed have
 ha d e f he k afel a d i c lia ce i h OSHA

- C ac a d if he ili c a ie e i v lved i f he f he ed k i h i e abli hed c a l cal e e i e .
- A k he ili c a ie e e abli h hel ca i f de g di alla i i he a fe cava i k. If he ca e d i h i 24 h (le he e i d e i ed b a e l calla i l ge) ca e abli h he e ac l ca i f he ili i alla i , e l e a ceed i h ca i , hich i cl de i g de ec i e i e he acce able ea l ca e ili i alla i .
- De e i e he e ac l ca i f de g di alla i b afe a d acce able ea he e cava i e a i a ach he a i a el ca i f he i alla i .
- E e ha hile he e cava i i e , de g d i alla i a e ec ed, ed e ved a ece a afeg a d ke .

Protective Systems

How can employers prevent cave-ins?

OSHA ge e all e i e ha e l e ec ke f cave-i b :

- Sl i g a d be chi g he ide f he e cava i ;
- S i g he ide f he e cava i ;
- Placi g a hield be ee he ide f he e cava i a d he k a ea.

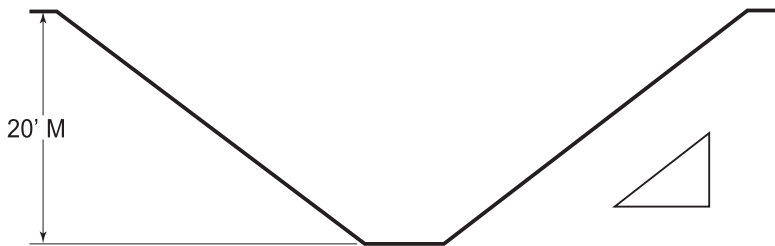
What types of protective systems can employers use to protect workers from cave-ins?

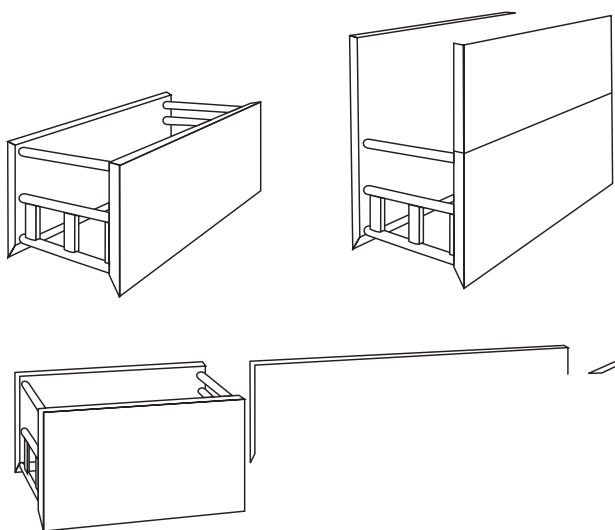
l a ca e he e f ecive e eeded i ell k a d i le e. A he i e e l e ill de ake he ec le ce f de i g i g a ecive e . De i g i g a ecive e e i e c ide a i f a fac , i cl di g: il cla i ca i , de h fc , a e c e f il, ea he a d cli a e, a d he e a i

i he vicini .E l e a e fee ch e he ac ical
de ig ha ill vide he ece a ec i .A e
ed ee he e i ed e f a cec i e ia.

The E cava i a da d de c i be va i e h d a d
a ache ha ca be ed de ig ec ive e .
E a le f ec ive e ha ca be ed c l
i h he E cava i a da d i cl de:

- Sl i g he ide f he e cava i a a gle ee e
ha 1/:1 (f eve f f de h, he e ch be
e cava ed back 1/ fee).A l e f hi g ada i i afe f
a e f il.





- A egi e ed fe i ale gi ee de e i e ha he
c ei fa e gha a f he e cava i ha i
ld be affec ed b he e cava i ac ivi ha he
e cava i k ill e a ha a d ke .

E cava i ha ld de i e ide alk , ave e , a d
a e a c e a e hibi ed le he e l e
vide a a ia el de ig ed e a he
effec ive e h d f ec i g ke f he ible
c lla e f h e c e .

What are the requirements for safely installing and removing protective systems?

The E cava i a da d e i e e l e ake ce ai
e ec ke he i alli ga d e vi g
e . F e a le:

- Me be f e be ec el c ec ed
eve lidi g, falli g, kick edic able fail e.
- S e be i alled a d e ved i a a e
ha ec ke f cave-i a d c alc lla e
a d f bei g ck b e be f he e .
- Me be f e be ve l aded.
- Bef e e a e val fi divid al e be , addi i al
eca i a e e i ed, cha i alli g he c al
e be ca l ad i ed he e .
- Re val begi a , a d g e f , he b f
he e cava i .
- Back i g g e ge he i h he e val f
e f e cava i .

I addi i , he a da d e i e cava i f 2 fee (0.61
e e) le bel he b f he e be fa
e , b l if he e i de ig ed e i hef ce
calc la ed f hef ll de h f he e cha d he e a e
i dica i , hile he e chi e , fa ible l f
ilf behi d bel he b f he e .
E l e c di a e he i alla i f e
i h he e cava i k.

What do employers need to do to maintain materials and equipment used for

i ide he e cava i b laci ga d kee i g ch a e ial
 e i e a lea 2 fee (0.61 e e) f he edge
 a d/ b i ga e ai i g device kee he a e ial
 e i e f falli g lli gi he e cava i .

- P vide a a i g e (ch a ba icade , ha d

hield e eve cave-i , a e e val
 c l he a e level, he e fa afe ha e a d lifeli e.
 If a e l e e a e e vale i e c l
 eve a e acc lai , he e i e a d e ai
 be i ed b a c e e e e e e e . If
 e cava i ki e he a al dai age f face a e ,
 he OSHA a da d al e i e he e f dive i di che ,
 dike , he i able ea eve face a e f
 e e i g he e cava i a d vide ade a e d ai age f
 he ad jace a ea . l addi i , a c e e e i ec
 e cava i bjec ff f heav ai , a d e cava i
 bjec ch ff a e bjec he e i e e de c ibed
 evi l i hi a ag a h.

How can employers protect workers from hazardous atmospheres inside excavations?

A he ic e i gi e i ed bef e ke e e a
 e cava i g ea e ha 4 fee (1.22 e e) i de h he e a
 ge de c ie c a ha a d a he e i e e
 c ld ea abl bee e ced, cha i e cava i i la d
 a ea e cava i i a ea he e ha a d b a ce a e
 ed ea b . If he e a e a ha a d c dii e e ,
 he e l e e e ha ade a e e ca i a e
 ake eve e l e e e h ec dii . S ch
 e ca i i cl de vidi g ke i h e e i a
 ec i ve ila i . l addi i , he c l a e ed
 ed ce he level fa he ic c a i a acce able
 level , e i g bec d ced a fe a e ce a
 e e ha he a he e e ai afe.

If ha a d a he ic c dii e i a ea abl
 bee e ced devel i a e cava i , he e l e
 e e he ead availabili fe e ge c e c e e i e ,
 cha b ea hi ga a a , a afe ha e a d li e , a
 ba ke e che . Thi e i e be a e ded he i e.

N e: l addi i he E cava i a da d ' vi i
 ha a d a he e i e cava i , OSHA' C ed S ace
 i C c i a da d (29 CFR Pa 1926, S b a AA) a lie
 -e cava i k i hi ac ed ac el ca edi a

e cava i .The e a da d a e i e ded c le e each
 he a dadd e di i c ha a d :ha a d a he e
 i e cava i a d he addi i al ha a d a cia ed i h
 c ed ace l ca ed i hi e cava i .F e a le, he

licie , ced e , a d ac ice f ec i g ke f
 j b- ela ed afe a d heal h ha a d . See . ha.g v/
 P blica i / afe -heal h- a age e - e . df.

Workers' Rights

W ke have he igh :

- W ki g c di i ha d e a i k f e i ha .
- Receive i f a i a d ai i g (i a la g age a d
 v cab la he ke de a d) ab k lace
 ha a d , e h d eve he , a d he OSHA a da d
 ha a l hei k lace.
- Revie ec d f k- ela ed i j ie a d ill e e .
-

Establishing an Injury and Illness Prevention Program

The ke a afe a d heal hf l k e vi e i a
c ehe ive i j a dill e eve i g a .

I j a dill e e e i g a a e e h a c a
b a i a l l e d c e h e b e a d e v e i f k l a c e
i j i e a d i l l e e , h i l e e d c i g c e l e .
Th a d f e l e a c h e U i e d S a e a l e a d
a a g e a f e i g i j a d i l l e e v e i g a , a d
O S H A b e l i e v e h a a l l e l e c a a d h l d d h e a e .
Th i - f a e h a v e e i e e v l a g i d e l i e
f k l a c e i j a d i l l e e v e i g a . M
c c e f l i j a d i l l e e v e i g a a e b a e d
a c e f k e e l e e . T h e e i c l d e a a g e e
l e a d e h i , k e a i c i a i , h a a d i d e i c a i , h a a d
e v e i a d c l e d c a i a d a i i g , a d g a
e v a l a i a d i v e e . V i i O S H A ' I j a d i l l e
P e v e i P g a e b a g e a . h a . g v / d g / i c /
a f e h e a l h f e i f a i .

Compliance Assistance Specialists

OSHA ha c lia ce a i a ce . eciali h gh he
a i l ca ed i OSHA fce .C lia ce a i a ce
eciali ca vide i f a i e l e a d ke
ab OSHA a da d , h ed ca i al g a eci
ha a d OSHA igh a d e ibili ie , a d i f a i
addi i al c lia ce a i a ce e ce .F e de ail ,
vi i . ha.g v/dc /c lia ce_a i a ce/ca .h l
call 1-800-321-OSHA (6742) c ac l cal OSHA fce.

a age e ga , OSHA' O - ieC lai P ga
c d c ve 29,000 vi i all b ie kie
c ve i g ve 1.5 illi ke ac he ai .

O - iec lai e vice a e e a a e f e f ce e
a d d e l i e a l i e c i a i . C l a f a e
a g e c i e i v e i i e k i h e l e i d e i f k l a c e
h a a d , v i d e a d v i c e c l i a c e i h O S H A a d a d , a d
a i i e a b l i h i g a f e a d h e a l h a a g e e g a .

F e i f a i , d h e l c a l O - i e C l a i f c e
i a e , e e a b c h e C l a i S e v i c e ,
v i i . h a g v / c l a i , c a l l 1 - 8 0 0 - 3 2 1 - O S H A (6 7 4 2) .

U d e h e c l a i g a , c e a i e e l a e l e
a e e a i c i a i i O S H A ' S a f e a d H e a , h
Achie e e R e c g i j P , g a (SHARP). Eligibili f
a i c i a i i c l d e , b i l i i e d , e c e i v i g a f l l -
e v i c e , c e h e i v e c l a i v i i , c e c i g a l l
i d e i d h a a d a d d e v e l i g a e f f e c t i v e a f e a d
h e a l h a a g e e g a . W k i e h a e c e i v e S H A R P
e c g i i a e e e f g a e d i e c i d i g
h e e i d h a h e S H A R P c e i c a i i v a l i d .

Cooperative Programs

OSHA f f e c e a i v e g a d e h i c h b i e e ,
l a b g a d h e g a i a i c a T j E M k () - 2 . 2 (i) 2 (v) T i a 2 I T e F E

a d heal h eve k lace fa ali ie , i j ie a dill e e
 b devel i g c lia ce a i a ce l a d e ce
 ha e i h ke a d e l e , a d e d ca e ke a d
 e l e ab hei igh a d e ibili ie .

V *tar* *Pr tct* *Pr ra* (VPP)

The VPP ec g i e e l e a d ke i i va e i d
 a d fede al age cie h have i le e ed effec ive afe a d
 heal h a age e ga a d ai ai i j a dill e a e
 bel he ai al ave age f hei e ec ive i d ie . I VPP,
 a age e , lab , a d OSHA kc e a ivel a d ac ivel
 eve fa ali ie , i j ie , a dill e e h gha e
 f c ed : ha a d eve i a d c l , k i e a al i ,
 ai i g , a d a age e c i e a d ke i v lve e .

Occupational Safety and Health Training

The OSHA Tai i g l i e a e i h 27 OSHA Tai i g
 l i e Ed cai Ce e a 42 l cai h gh he U i ed
 S a e delive c e OSHA a d a d a d cc ai al
 afe a d heal h ic h a d f de a ea . F e
 i f ai ai i g c e , vi i . ha.g v/ iec.

OSHA Educational Materials

- *QuickTakes*, OSHA's free, on-demand video library, is a valuable resource for employers and employees alike. It provides a wide range of information on OSHA's mission, the agency's role in protecting workers, and the various safety and health hazards that workers may encounter. The library also includes information on OSHA's enforcement process, the agency's inspection process, and the various types of violations that OSHA can cite. For more information on *QuickTakes*, visit <https://www.osha-slc.gov/quicktakes/>.

OSHA Regional Offices

Regj i

B Regional Office
(CT*, ME*, MA, NH, RI, VT*)
JFK Federal Building, Room E340
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(617) 565-9860 (617) 565-9827 Fax

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Dalla , TX 75202

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