

UPRIGHT with STRUT and PLYWOOD SYSTEM

TABULATED DATA FOR TRENCH RESCUE SHORING^(Note 1)

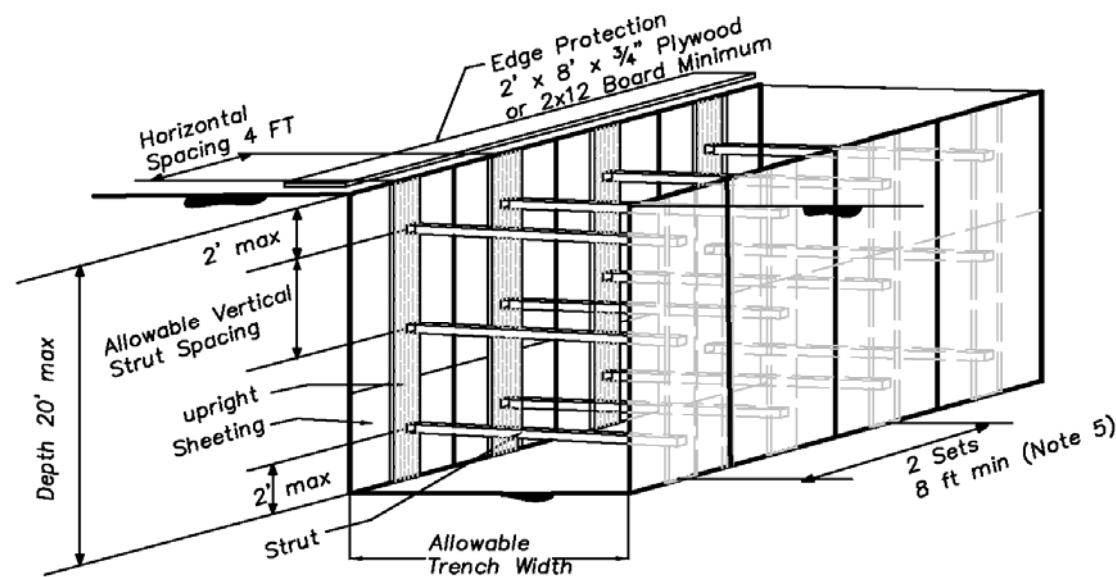
OSHA TYPE C-60 ^(Note 3)

Max Depth (ft)	Upright	Maximum Vertical Strut Spacing (ft)	Maximum horizontal Strut Spacing (ft)	Allowable Trench Width (ft) ^(Note 2)			Sheeting
				Strut			
				4x4	2x4+4x4	2-4x4	
6	2x12	4	4	9	11	13	3/4" CDX plywood
8	2x12	4	4	8	10	11	
10	2x12	4	4	7	9	10	
12	2x12	4	4	7	8	9	
14	2x12	4	4	6	7	9	
16	2x12	4	4	6	7	8	
18	2x12	3	4	6	7	9	
20	2x12	3	4	6	7	8	

OSHA TYPE C-80 ^(Note 4)

Max Depth (ft)	Upright	Maximum Vertical Strut Spacing (ft)	Maximum horizontal Strut Spacing (ft)	Allowable Trench Width (ft) ^(Note 2)			Sheeting
				Strut			
				4x4	2x4+4x4	2-4x4	
6	2x12	4	4	8	10	11	3/4" CDX plywood
8	2x12	4	4	7	8	10	
10	2x12	4	4	6	7	9	
12	2x12	4	4	6	7	8	
14	2x12	3	3	6	7	9	
16	2x12	3	3	6	7	8	
18	2x12	2	2	7	8	9	
20	2x12	2	2	6	7	9	

highlighted green = standard "2-4-2 system"



UPRIGHT with STRUT and SHEETING



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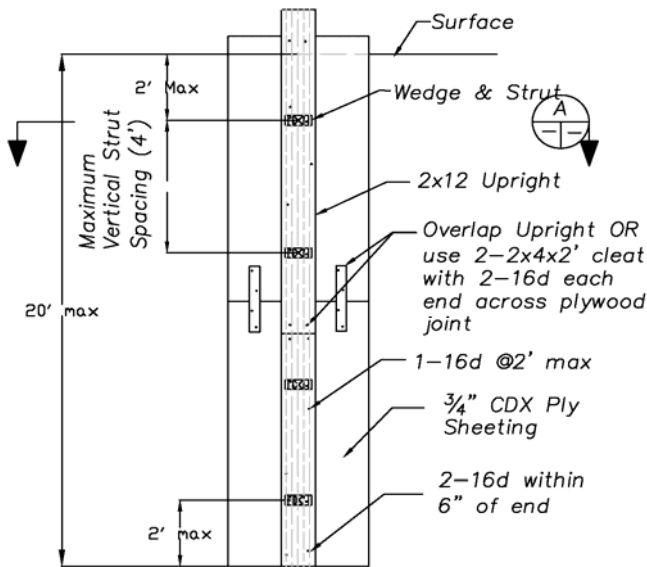
CER, Inc.
Construction Engineering Resource, Inc.
1837 Wright Street
Santa Rosa, CA 95404

Job #1373-1	10/1/2013
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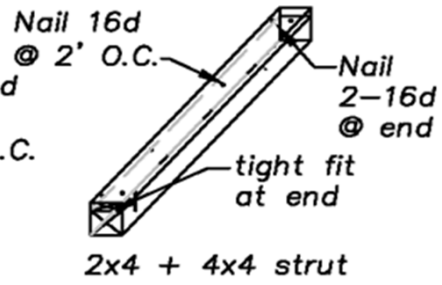
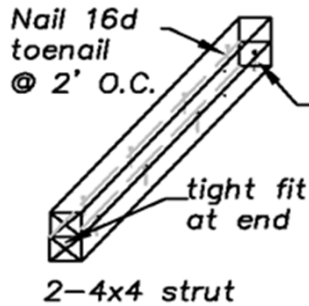
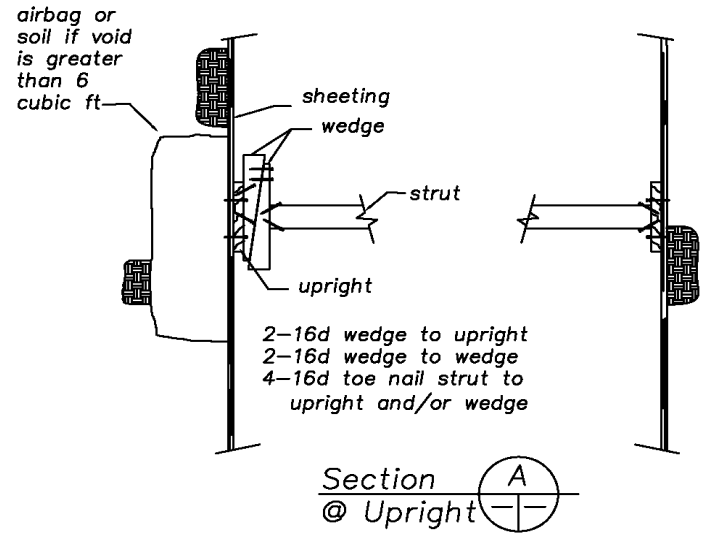
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TABULATED DATA FOR TRENCH RESCUE SHORING

Details



Wall Elevation



Framing Notes-

- 1) Use only 1 wedge set, do not stack them.
- 2) General rule for nailing strut connections-use two toe-nails (total 4 nails) on both sides of strut.
- 3) Struts may also be cut-to-fit and driven in without wedges.
- 4) Struts may also be manufactured, see Note 11.



Installation Notes

- 1) Uprights may be nailed to plywood before or after setting plywood into excavation.
- 2) Move spoil pile and obstructions a minimum of 2 ft from trench edge and place edge protection before installing shoring.
- 3) Place ladder within 25 ft of work. Ladder must be secure and accessible.
- 4) While working off a ladder and until top strut is secured, workers may only work within waist level to lip of trench and must be tied off.
- 5) Remove struts from bottom to top. If there is sheeting movement when bottom strut is removed, leave shoring in place and bury or remove with power equipment from outside the trench.

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TABULATED DATA FOR TRENCH RESCUE SHORING

Notes

- 1) This shoring system is in accordance with Cal OSHA Article 6, Section 1541.1(c)(3) Option 3-Designs Using Other Tabulated Data. This tabulation is for the purpose of protecting rescue personnel from cave-ins while rescuing victims of collapsed excavations and trenches, and training and for no other purpose.
- 2) In order to use these tabulations the soil must first be classified as Type C-60 or C-80. The soil loading configuration is rectangular. This means that the soil pressure at the top of the excavation is the same as at the ultimate depth of the excavation. **Read all element size and spacing requirements from the line at the depth the final excavation is expected to be ("original trench depth").**
- 3) C-60 Soil includes all soil types that will stand long enough to install shoring and have a water level at or below the bottom of the excavation.
- 4) Type C-80 soil is soil that will not stand up long enough to install shoring. Generally shoring in C-80 soil has to be installed in short increments or driven into the soil as excavation is taking place. Prior to reaching 12 ft deep in marine clays such as San Francisco "Bay Mud", Gulf States Swamp Mud, etc" an engineer should be consulted. If there is any additional deflection or movement after elements are installed additional upright and strutting may be required.
- 5) Minimum shoring system length is 2 sets. **The general rule for shoring system length is that it should be at least as long as the shoring system is deep.**
- 6) This tabulation includes loading from a spoil pile set back 2 feet from edge of trench and no higher than 4 ft and foot traffic. All heavy equipment and vehicles to be set back at least the depth of the trench.
- 7) Wood members shall be minimum Douglas fir #2 and better, S4S.
- 8) **Plywood shall be minimum 3/4" CD X. Decrease horizontal spacing, double up plywood or decrease upright spacing if deflection is occurring due to soil movement.**
- 9) Install strutting from top to bottom. Nailing can be done in stages by first using enough nails to stabilize shoring and then following through to make sure that required nail quantity is achieved.
- 10) This shoring system may be used in conjunction with Wale with Strut and Plywood System, and Trench End Shore System.
- 11) Alternative manufactured strut systems such as screw jacks, pneumatic struts, and single/double cylinder hydraulic jacks may be substituted for timber struts installed in accordance with their tabulated data.
- 12) If plywood is 3/4" Finform it is OK to eliminate the 2x12 upright and use struts at the tabulated spacing nailed directly to the Finform.
- 13) Two 3/4" CDX plywood sheets may be used in lieu of one sheet of 3/4" CDX with a 2x12 upright.
- 14) Aluminum fire service ladders with 4x4 cribbing may be used as an upright or waler. (see CMC Trench Rescue Manual)



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