

VERTICAL SHORES

INSTALLATION and REMOVAL PROCEDURES

GENERAL NOTES

Speed Shore aluminum hydraulic Vertical shores are vertically oriented, hydraulically applied trench shoring devices. They are manufactured in compliance with the Federal Occupational Safety and Health Administration (OSHA) Standards.

Vertical shores are composed of vertical rails and 2" diameter hydraulic cylinders, which are manufactured from 6061-T6 aircraft grade aluminum alloy and have a safe working load of 23,000 pounds. The normal working pressure range of the cylinders is 750-1000 psi. Vertical shores with 1 1/2 foot long rails have a single hydraulic cylinder and are commonly known as single shores. Vertical shores with 3 1/2, 5, 7, or 8 foot long rails have 2 cylinders. Vertical shores with 12 foot rails have 3 cylinders, and those with 16 foot rails have 4. .

Vertical shores with one or two cylinders (1 1/2 - 7 foot rails) use Standard Rail, with a section modulus of .44 cubic inches. Those with 3 or 4 cylinders (12 - 16 foot rails) use Heavy Duty Rail, with a section modulus of 1.24 cubic inches.

Sheeting is often used with vertical shores to control local raveling of the trench face between the shores. The OSHA Standard requires that the sheeting be either 1.125" softwood plywood, or 14 ply white artic birch finland form, although manufacturers and vendors may provide equivalent alternatives. The sheeting used with vertical shores is not intended for use as a structural member, but only to control local raveling (sloughing of the trench face) between the shores.

Single and double cylinder vertical shores are typically installed and removed from the top of the trench by manual means using Speed Shore installation tools, but the larger systems or those with plywood sheeting attached to the rails are typically installed and removed by hoisting equipment and slings.

The designated Competent Person shall ensure that all excavation work is done in compliance with the requirements of the OSHA standard for excavations

and manufacturer's tabulated data. They will inspect all components of the shoring system prior to use, as well as daily and when changes in jobsite conditions require. Any damaged, defective or inadequate components shall be repaired or replaced.

A TRAINED COMPETENT PERSON SHALL: SUPERVISE ALL EXCAVATION OPERATIONS, ENSURE THAT ALL PERSONNEL ARE WORKING IN SAFE CONDITIONS, AND HAVE THOROUGH KNOWLEDGE OF THE APPROPRIATE TABULATED DATA. THE COMPETENT PERSON SHALL HAVE THE AUTHORITY TO STOP WORK WHEN IT IS UNSAFE FOR WORKERS TO ENTER AN EXCAVATION.

Manufacturers Tabulated Data

Speed Shore's Tabulated Data complies with the O.S.H.A. standards as stated in the Code of Federal Regulations 29, Part 1926, Subpart P - Excavations, Section 1926.652(c)(2). This data shall only be used by the contractor's competent person in the selection of Speed Shore Vertical Shores. The competent person shall be experienced and knowledgeable in trenching and excavation procedures,

Depth of Operation

Vertical Shores are designed to support lateral earth pressure through the strength of its hydraulic cylinders. Lateral Earth Pressure being a function of the equivalent weight effect of the soil and the depth of excavation. Vertical shores may be used to shore trenches up to 20 feet in depth in Type A and B soils with the charts provided in Appendix D of the OSHA excavation standard (subpart P), and up to 25 feet in Type A, B, and C-60 soils with Speed Shore manufacturer's tabulated data.

Lifting Sling

When required Vertical Shores must be lifted with a removable sling manufactured in compliance with the requirements of OSHA standard for rigging equipment, and rated for the anticipated load. Please note that tie-down chains and other improvised slings are not appropriate as lifting devices.

Inspection

The designated Competent person will inspect all components of the shoring system prior to use, as well as daily and when changes in jobsite conditions require. Any damaged, defective or inadequate components shall be repaired or replaced.

ACCESSORY ITEMS

Hydraulic Pump – required to pressurize the shoring system. There are three pumps available for use:
 HP-100 - Manual hydraulic pump – 5 gallon metal container
 HVP-2000 - High volume manual hydraulic pump with 7 ½ gallon plastic container.
 HP-200 - 12-volt electric hydraulic pump

Shoring Fluid – required for use with hydraulic pumps. Speed Shore manufactures two grades of shoring fluid:
 SF-SG-12 - Summer grade shoring fluid concentrate
 *Sold as one case of 12 each- 8oz. Bottles.
 *One 8oz. bottle of SG fluid is used per 5 gallons of water.
 SF-WG-06 - Winter grade shoring fluid concentrate
 *Sold as one case of 6 each – 1 gallon bottles
 *Mix ratios are prescribed on each container

Release/Removal Tools

The release tool is required to remove the hose from the vertical shore after installation and release pressure from the cylinders prior to removal of the vertical shore from the excavation. Removal hook used in conjunction with the Release tool is required to remove vertical shore from the excavation. Speed Shore manufactures three lengths available for use:

- RT-30 - 30" Release Tool
- RH-30 - 30" Removal Hook
- RT-48 - 48" Release Tool
- RH-48 - 48" Removal Hook
- RT-96 - 96" Release Tool
- RH-96 - 96" Removal Hook

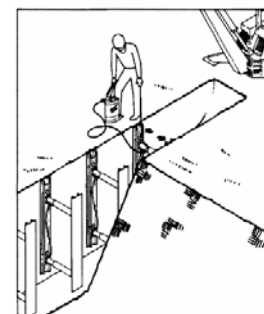
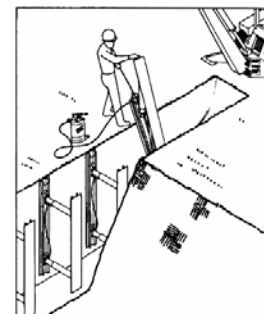
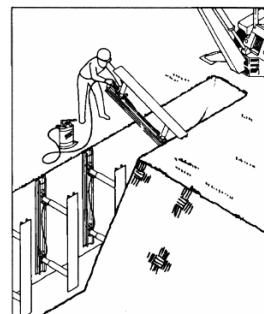
Installation Procedures

In stable soils that will stand throughout excavation, the following procedure is appropriate:

1. Complete the excavation.
2. Place vertical shore perpendicular to trench.
3. Unfold shore to open position.
4. Connect the female coupler on the pump hose to the male coupler on the vertical shore.
5. Prime the system by pumping enough fluid to initiate movement of cylinders.
6. Vertical Shore should now be expanded to a position slightly less than the inside

dimensions of the excavation or plywood sheeting.

7. Suspend the vertical shore at its intended location in the excavation (top hydraulic cylinder between 1' and 2' below surface).
8. Pump the system to pressure desired (750-1,000 psi), momentarily monitor pressure gauge for pressure loss, and then release hydraulic coupler from cylinder by use of the Release Tool.
9. Release pressure from the pump hose by opening the bypass valve on the hydraulic pump. This relief will be indicated by the pressure gauge on the pump.
10. Care must be taken to insure that hydraulic connections are kept clean during removal and reconnection to the next vertical shore.
11. Connect the hose assembly to the next vertical shore to be installed.



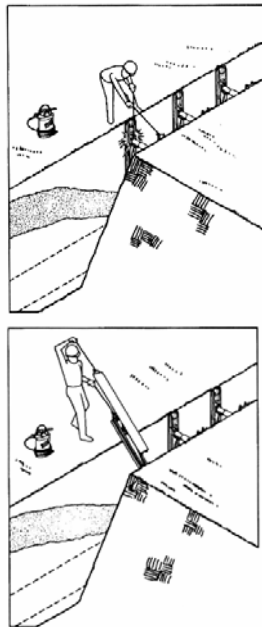
Removal Procedures

To remove Vertical Shores from the excavation the following procedure is suggested:

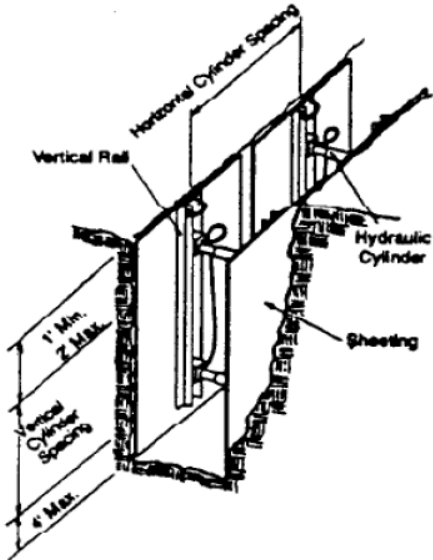
1. From the surface of the excavation, relieve pressure on the cylinders in the Vertical Shore by use of the Release Tool. The tool is used to press on the male connector on the top of cylinder allowing shoring fluid to escape to the excavation, insure hook is attached to rail. Initially release a small amount of fluid from the cylinder and observe the shoring system for any soil movement. Next, take the Removal Hook and attach removal tool to opposite rail handle. Take care to remain in a safe position during continued pressure release on cylinder. After observing the effect of pressure release upon the system, complete fluid removal until the cylinder has been compressed to the desired position.
2. After pressure has been relieved on the cylinders, lift unit sideways out of the excavation.
3. Continue this procedure until all units are removed from the excavation.
4. If used, remove sheeting.

Note: When using single vertical shores or when stacking units, the vertical shore should always be installed from the top down and removed beginning with the bottom unit and working upward. All installation and removal should be accomplished from outside the excavation.

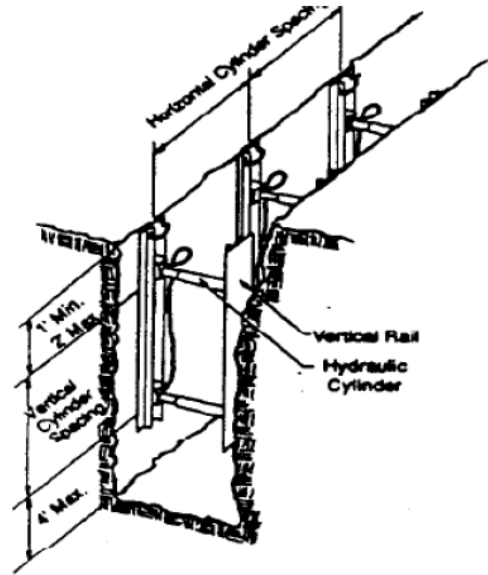
Speed Shore Vertical Shores must always be installed in accordance with requirements of all regulatory agencies having jurisdiction over shoring systems, and installation must meet the minimum requirements of current Manufacturer's Tabulated Data published by Speed Shore Corporation.



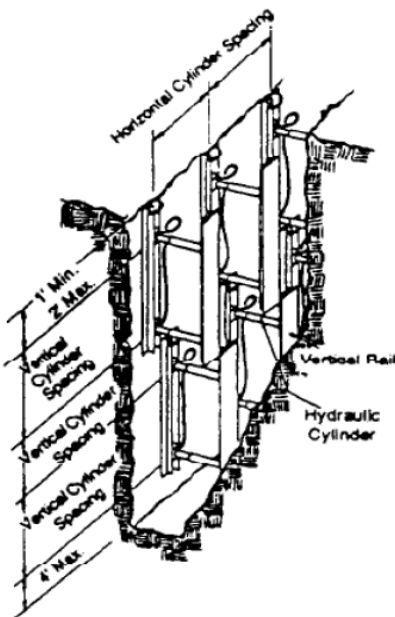
Examples of typical installations



**FIG. 1
WITH SHEETING**



**FIG. 2
WITHOUT SHEETING**



**FIG. 3
STACKED**