

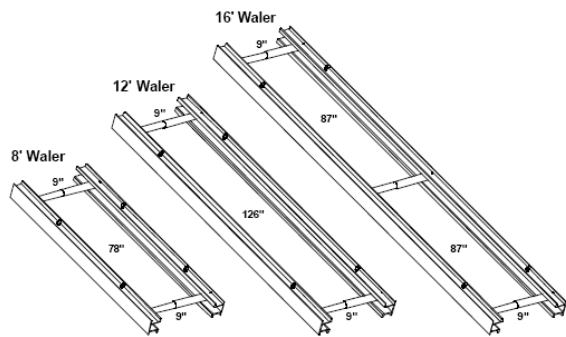
WALER SYSTEMS

INSTALLATION and REMOVAL PROCEDURES

GENERAL NOTES

Speed Shore Waler Systems are hydraulically applied shoring devices designed to be installed horizontally to support weaker soils that require sheeting. They are manufactured in compliance with the Federal Occupational Safety and Health Administration (OSHA) Standards.

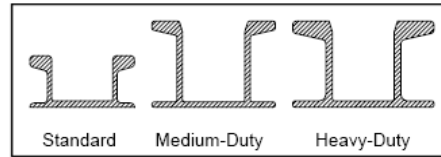
Waler Systems are designed to support a uniform lateral earth pressure over the full load zone area of each Waler. Lateral Earth Pressure being a function of the equivalent weight effect of the soil and the depth of excavation. The Walers are designed as simple span beams between the hydraulic cylinders which support the full load placed upon the system. Waler Systems are composed of two horizontal Walers, with 2" diameter or 3" diameter aluminum hydraulic cylinders and appropriate sheeting. Cylinders are manufactured from 6061-T6 alloy and have a safe working capacity of 23,000 pounds for 2" diameter cylinders and 42,000 pounds for 3" diameter cylinders. Normal working pressure in the cylinder is 750 to 1,000 psi. (8 foot and 12 foot long Walers require 2 cylinders per unit and 16 foot long Walers require 3 cylinders per unit). The maximum horizontal spacing of cylinders along one Waler is 126" on the 12' long units.



Currently Speed Shore Waler Systems are manufactured in standard lengths of 8', 12', and 16'. Available widths are determined by the model cylinder utilized. Model numbers indicate the maximum operating width of the Waler. Waler Systems are available with three optional rail configurations to meet variable strength

requirements. Standard rail (Section Modules 3.67 cu. in.), medium duty (Section Modules 7.5 cu. in.) and heavy duty rail (Section Modules 14.5 cu. in.).

Waler Rail Cross-Sections



Refer to Manufacture's Tabulated Data for approved sheeting. Walers installed along the same horizontal plane down the length of the excavation are placed end to end so that the end cylinders in adjoining Walers are approximately two feet apart.

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.

Manufacturer's 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 Waler Systems. The competent person shall be experienced and knowledgeable in trenching and excavation procedures,

Depth of Operation

Waler Systems 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. Waler Systems 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 20 feet in Type A, B, and C-60 soils with Speed Shore Manufacturer's Tabulated Data.

Lifting Sling

When required Waler Systems 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

After desired pressure is applied, release of hydraulic hose from the cylinder connection is accomplished by means of a Waler Release Tool. The tool is also utilized to release pressure from the cylinders prior to removal of the Waler System from the excavation. Speed Shore manufactures three lengths available for use.

Standard Duty Waler Tools
RH-W-30 – 30” Release Tool
RH-W-48 – 48” Release Tool
RH-W-96 – 96” Release Tool

Medium and Heavy Duty Waler Tools
RT-WMH-30 – Release Tool
RT-WMH-48 – Release Tool
RT-WMH-96 – Release Tool

Manifold

Connection of the hydraulic pump to the cylinders of the Waler System is made by means of a hand held manifold which includes valves to control flow of hydraulic fluid to individual, combinations of cylinders or the full system. Manifold units include hoses for connection to the various cylinders. Extension hoses are available for deep installations. Speed Shore manufactures three different manifolds available for use:

HBM-144-2 (2-Way Hose Bridle Manifold)

HBM-144-3 (3-Way Hose Bridle Manifold)

HBM-144-4 (4-Way Hose Bridle Manifold)

Installation Procedures

Stable Soils that will stand throughout excavation, the following procedure is appropriate:

1. Complete the excavation.
2. Attach the 4 point lifting sling to the 4 lifting eyes on the Waler.
3. Connect appropriate hose bridle manifold by coupling a hose to each cylinder of the Waler. Care should be taken to connect hoses in series with cylinders to maintain relationship of the valve being operated to the cylinder responding to pressure.
4. Connect the female coupler on the pump hose to the male coupler on manifold system. Valve arrangements on the manifold should be as follows:
 - a) Valves on pressure hoses connected to cylinders should be open.
 - b) Discharge valve on the dump line should be closed.
5. Prime the system by pumping enough fluid to initiate movement of cylinders.

6. Waler rails should now be expanded to a position slightly less than the inside dimension of the excavation
7. Lift and suspend the Waler at its intended location in the excavation (between 1 ft. and 2 ft. below surface).
8. Next drop in the approved sheeting between the waler and the wall of the excavation.
9. 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 Waler Release Tool.
10. Release pressure from the pump hose/manifold by opening the bypass valve on the hydraulic pump. This relief will be indicated by the pressure gauge on the pump.
11. Care must be taken to insure that hydraulic connections are kept clean during removal and reconnection to the next Waler System.
12. Connect the hose assembly to the next Waler to be installed.
13. Lower Waler units should be lifted in a non-pressured state so they will be narrow enough to insert through the previously installed units.
14. Insert lower Walers through those installed and position at desired elevation. Repeat above procedure to pressure unit and remove hoses.

Less-Stable Soils that tend to fail as digging progresses and do not present a near vertical excavation face or wall, may require that sheeting be driven prior to beginning excavation.

In this case:

1. Start digging a pilot cut 2-3 feet deep.
2. Follow steps 2 through 7 under stable soils.
3. Drive the sheeting around the perimeter of the first waler in the excavation to the desired depth of the excavation.
4. Excavate from within the driven sheeting to the final required depth or to the depth of the next waler to be installed.
5. Insert the second Waler through the previously installed unit and complete installation.
6. Lower units may be installed following the above procedure.

Observe that the undisturbed soil will support sheeting prior to installation of the first Waler.

Thereafter, installed Walers will support the upper area of the sheeting while undisturbed soil supports the lower area.

PLEASE NOTE: Final determination of the installation procedures will be up to the Competent Person to follow safe installation procedures depending on soil and site conditions. Also on the installation of multiple walers in a vertical plane, the walers may be stacked on top of each other, lifting sling attached to the bottom unit, and the multiple units lifted and installed at the same time. This may require multiple hose manifold manifolds.

Removal Procedures

To remove Waler Systems from the excavation the following procedure is suggested:

1. Connect lifting slings to lifting eyes on the bottom unit.
2. From the surface of the excavation, relieve pressure on the cylinders in the Waler by use of the Waler Release Tool. The tool is used to press on the male connector on the tip of the cylinder allowing shoring fluid to escape to the excavation. Initially release a small amount of fluid from the cylinder and observe the shoring system for any indication of soil movement. Take care to remain in a safe position during continued pressure release. After observing the effect of pressure release upon the system, complete fluid removal until the cylinder has been compressed to the desired position.
3. After pressure has been relieved on the cylinders, lift the unit up to the next Waler above. Repeat pressure relief on that Waler and lift if by means of the unit previously released.
4. Continue this procedure until all units are removed from the excavation.
5. Disconnect and store the hydraulic assembly and manifold.
6. Remove sheeting as appropriate.

PLEASE NOTE: Final removal procedures to be determined by the Competent Person on job site based on backfill requirements.

Note: Waler Systems should always be installed from the top down and removed beginning with the bottom unit and working upward. All installations and removal should be accomplished from outside the excavation.

Speed Shore Waler Systems 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:

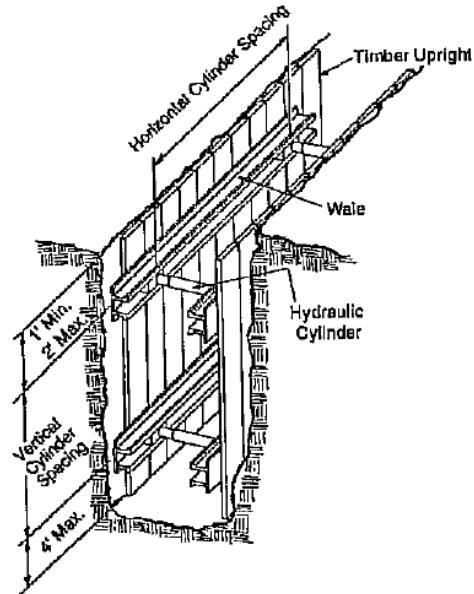


FIG. 2
WITH TIMBER SHEETING

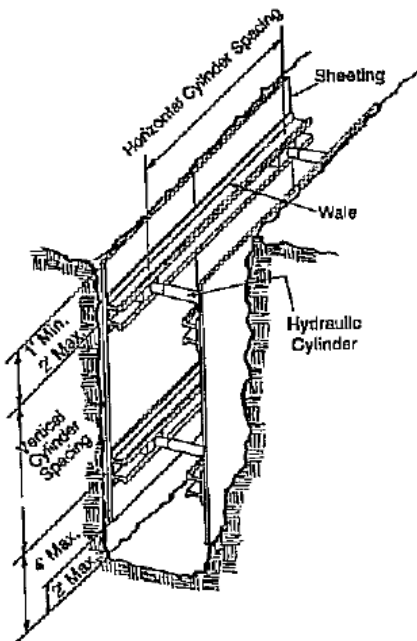


FIG. 1
WITH PLYWOOD

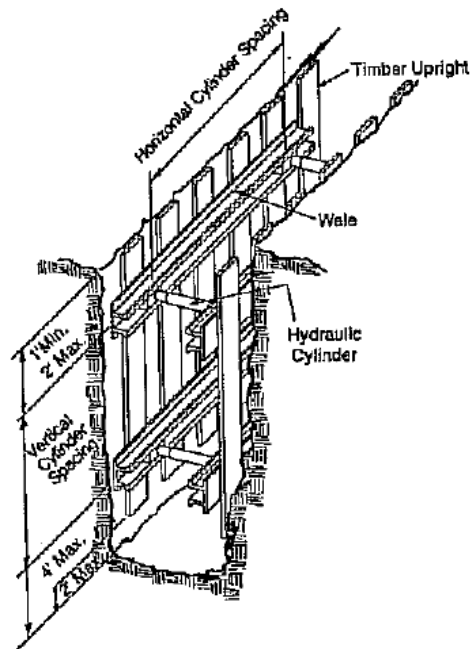


FIG. 3
WITH SPACED TIMBER SHEETING