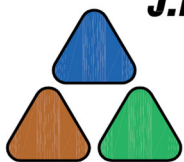
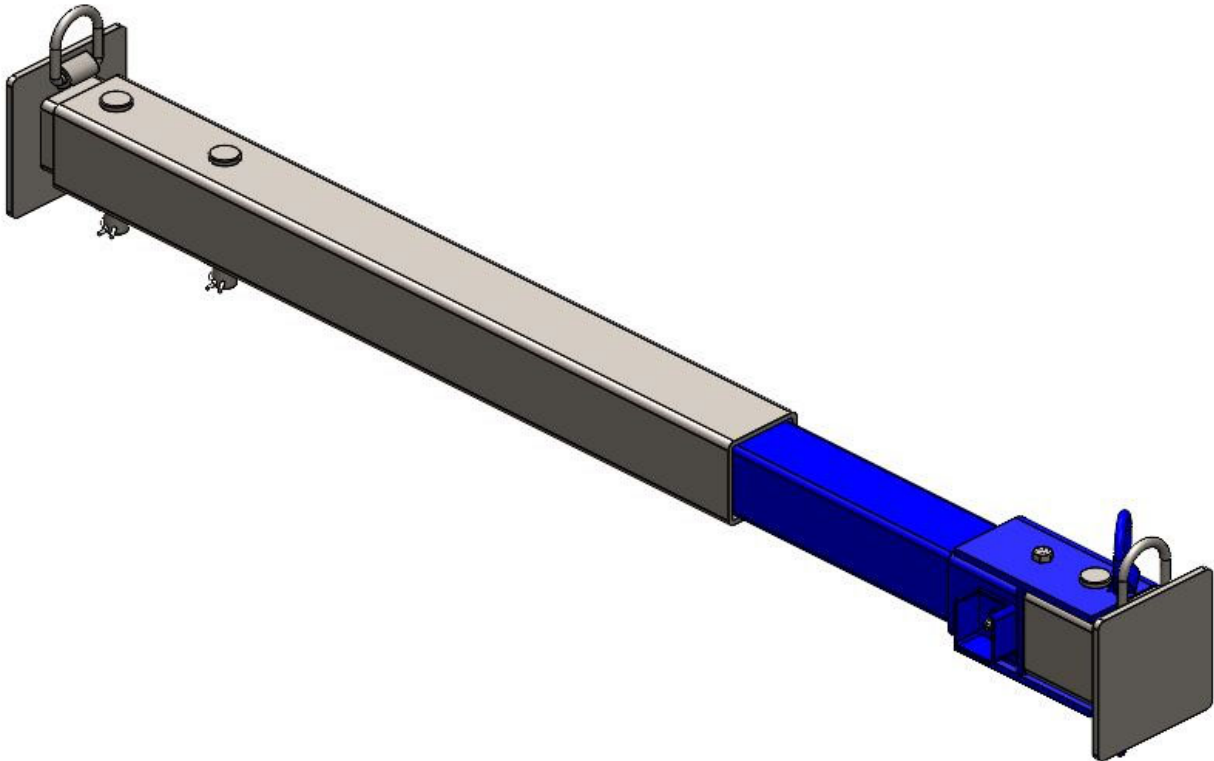


# 6-INCH HYDRAULIC STRUT

**TABULATED DATA**  
Effective June 25, 2021



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JMT #: 16260-19

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**Description**

The Pacific Shoring Products 6-Inch Hydraulic Strut is designed to repurpose components used in the traditional 4-Way Hydraulic Brace System. This Single Ram application allows you to use a single 6-Inch Hydraulic Strut in conjunction with cylinder and socket side attachments. Together they can be used in waled excavation support systems as well as pile and plate shoring applications. The Pacific Shoring Products 6-Inch Hydraulic Strut is generally used in situations where hydraulic force is required. The system uses an auto retractable 3-inch hydraulic cylinder with 36 inches of stroke that provides a 40,000 lb. safe working load. The cylinder is encapsulated in a 6-inch corner bracket and a high strength steel over sleeve extension assembly. 6-Inch Hydraulic Struts are designed to work in trenches up to 25 ft. in width and depth. In all situations, a competent person should determine that the strut is properly set and fixed into position.

## General Information on Usage of the 6-Inch Hydraulic Struts

1. The 6-Inch Hydraulic Strut tabulated here is based on requirements of Federal OSHA 29CFR, Part 1926, Subpart P-Excavations, and Trenches.

**1926.652(c)(2)-Option (2) - Designs Using Manufacturer's Tabulated Data.**

1926.652(c)(2)(i) -Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

All provisions of Subpart P apply when utilizing this tabulated data. The contractor's competent person shall use this data to select allowable trench depth, trench length and vertical spacing. The competent person utilizing this tabulated data shall be experienced and knowledgeable of all requirements of Subpart P, and trained in the use and safety procedures for 6-Inch Hydraulic Strut applications.

2. Use of this tabulated data is dependent on first classifying the soil in accordance with OSHA Appendix A, Soil Classifications. Classification shall be determined just prior to installing 6-Inch Hydraulic Strut Systems. Soil conditions may change at a later date and require reevaluation of the strength and allowable depth.
3. 6-Inch Hydraulic Struts are tabulated based on the effect of a 20,000 lbs., surcharge load set back 2 ft. from the edge of the trench and the equivalent weight effect of the OSHA soil type, see classification of soil types, note 2.
4. The depth and spacings given in **Table 2 & Table 3** govern the use of Pacific Shoring Products 6-Inch Hydraulic Strut System and not tabulations given by other manufacturers. This tabulated data applies to 6-Inch Hydraulic Strut Systems manufactured by Pacific Shoring Products, LLC. Any alterations to the system or variance from this tabulated data shall be indicated in a site-specific plan prepared and approved by a registered engineer.
5. The faces of excavations shall be vertical so that the shoring piles and wales are vertical and horizontal to the strut. The end walls shall be within 6 inches of the sheeting. If the soil face is greater than 6 inches backfill the void with excavated soil or crushed rock.
6. 6-Inch Hydraulic Strut Systems shall be installed and removed from outside the trench, see installation and removal procedure.
7. The competent person shall continually monitor the shored excavation for changed conditions such as water seepage, soil movement cracks at the surface, sloughing or raveling, proper surcharge load weight less than 20,000 lbs. and setback a minimum of 2 ft. that may damage shoring equipment.
8. Workers shall always enter, exit, and work inside the shored area of the trench.
9. Tabulated depths are limited to 25 ft. Additional depth may be achieved when the design is by a registered civil engineer.
10. 6-Inch Hydraulic Struts shall always be secured so that it cannot fall down vertically due to gravity forces.

## Classification of Soil Types

1. Soil classification shall be in accordance with OSHA Appendix A and classified just prior to installing the 6-Inch Hydraulic Strut. Soil conditions may change at a later date and the 6-Inch Hydraulic Strut Systems may need to be reset at a different spacing.
2. The equivalent weight of OSHA soil types\* is assumed to be as follows:

- OSHA Type “A” Soil                      25 PSF per ft of depth
- OSHA Type “B” Soil                      45 PSF per ft of depth
- Type “C-60” Soil                         60 PSF per ft of depth\*\*
- OSHA Type “C” Soil                      80 PSF per ft of depth

\* These equivalent weights were adapted from OSHA 1926 Subpart P App C, Timber Shoring for Trenches, Tables C-1.1, C-1.2, and C-1.3

\*\* Type C-60 soil is not identified or classified in OSHA Appendix A

3. Type C-60 soil is soil that does not qualify as OSHA Type A, or Type B, can be cut with vertical walls and will stand up long enough to safely insert and pressurize 6-Inch Hydraulic Strut Systems.

## Allowable Sheeting

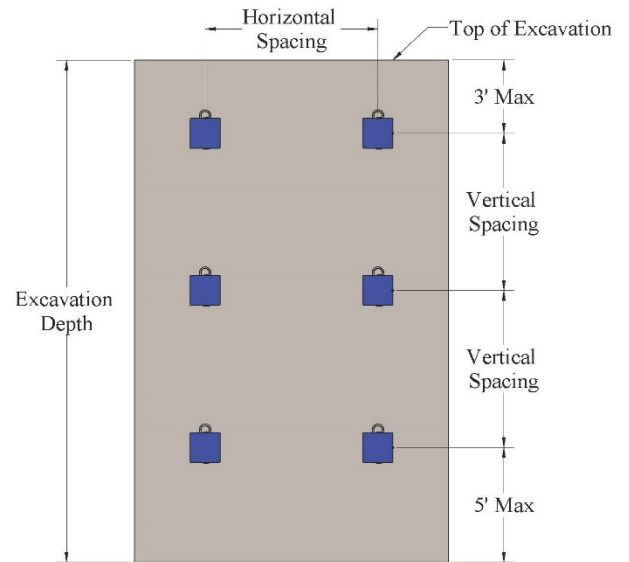
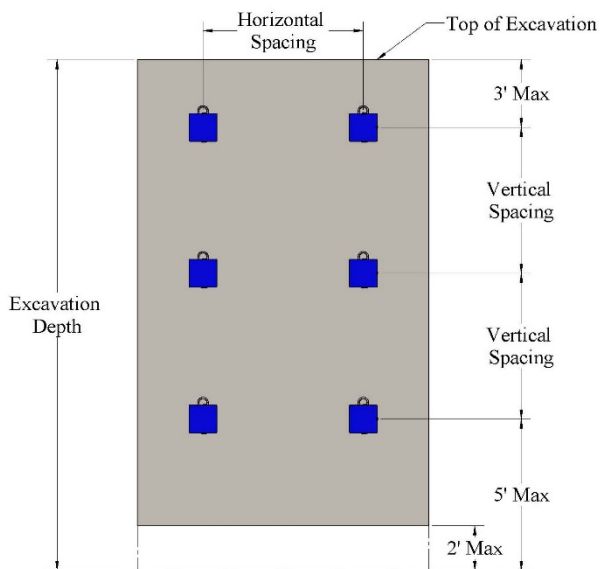
Sheeting must be used on the end face of the excavation. Sheeting along the trench shall follow the sheeting requirements of the tabulated data used for shoring of the entire trench. Allowable sheeting is as follows:

Table 1: Allowable Sheeting		
Material	Grade / Yield Stress	Effective Section Modulus, KS
1” Steel Plate (or thicker)	ASTM A-36	2.0 in <sup>3</sup> /ft

**Allowable Depth & Vertical Spacing for 6-Inch Hydraulic Struts Using (1" Steel Plate)**

The following tables govern the usage of the Pacific Shoring Products 6-Inch Hydraulic Strut Systems:

Table 3: Allowable Depth & Vertical Spacing Using 1" Steel Plate			
Trench Depth	6-Inch Hydraulic Strut Requirements		
	Max Horizontal Spacing	Max Vertical Spacing	Width of Excavation (With OS1 Oversleeve)
<b>OSHA Type "A" Soil</b>			
to 10'	10'	10'	25'
10' to 15'	10'	10'	25'
15' to 20'	9'	9'	25'
20' to 25'	8'	8'	25'
<b>OSHA Type "B" Soil</b>			
to 10'	10'	10'	25'
10' to 15'	8'	8'	25'
15' to 20'	7'	7'	25'
20' to 25'	6'	6'	25'
<b>OSHA Type "C-60" Soil</b>			
to 10'	8'	8'	25'
10' to 15'	7'	7'	25'
15' to 20'	6'	6'	25'
20' to 25'	5'	5'	25'
OS1 = 6" x 6" x .375" High Strength Steel (ASTM A500 – GR B)			



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## **6-Inch Hydraulic Strut System Installation and Removal**

### **Installation Procedure**

A competent person trained in installation and safe use of the system shall be present during installation. Prior to start of the excavation the sheeting and 6-Inch Hydraulic Strut Systems should be at the site and assembled so that the shoring equipment can be installed immediately following the excavation work. The excavation walls should be vertical, straight, and square.

**Step 1** Assemble the 6-Inch Hydraulic Struts on the surface.

**Step 2** Attach lifting harness and hydraulic hose to hydraulic fitting on Hydraulic Strut, open valve on the pump so that the shore cannot be pressurized.

**Step 3** Set plywood, finform or steel plates if required and not attached to the shore into trench.

**Step 4** Lower shore into trench with properly situated and adequately sized lifting equipment such as backhoe, boom truck, excavator, or crane.

**Step 5** Close the valve on the pump and pressurize hydraulics to a minimum of 1000 psi. Pressure gauge should hold at pressure and not indicate loss of pressure.

**Step 6** The end sheeting must be within 6" of the trench end. If the spacing is greater than 6", backfill between the sheeting and the trench wall with excavated soil or crushed rock.

### **Removal procedure**

**Step 1** Attach lifting harness to the 6-Inch Hydraulic Strut prior to releasing pressure.

**Step 2** Place release tool over hydraulic fitting and release fluid and pressure.

**Step 3** Lift shore out of trench with properly situated and adequately sized lifting equipment such as backhoe, boom truck, excavator, or crane.

### **Note**

**Depending on the length of the shore and width of the trench different installation procedures may be used. It is the responsibility of the contractor and his competent person to establish a safe installation and removal procedure for each application. All trench shore installers shall be instructed in the procedure prior to installing the shores.**

## Installation Support

6-Inch Hydraulic Strut components are assembled, rigged, and set from outside the excavation

Figure 2. 6-Inch Hydraulic Strut Components

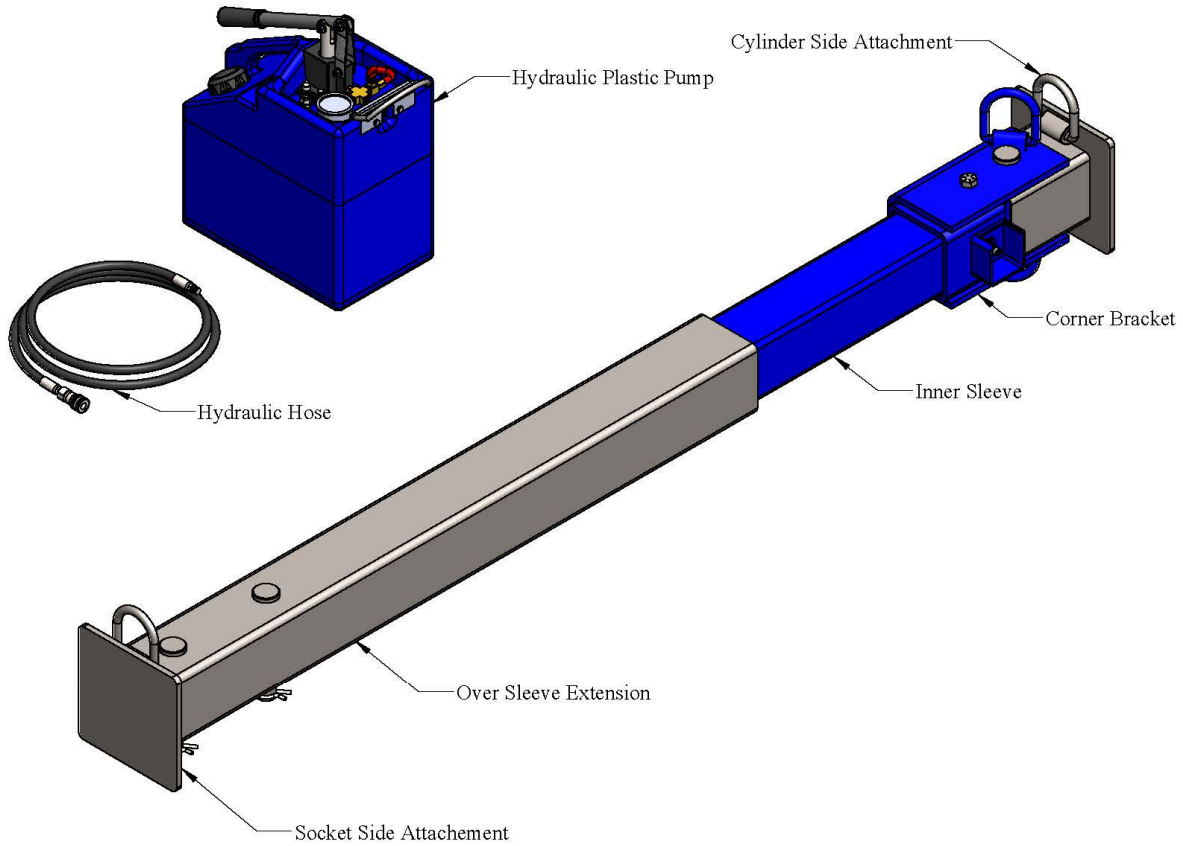
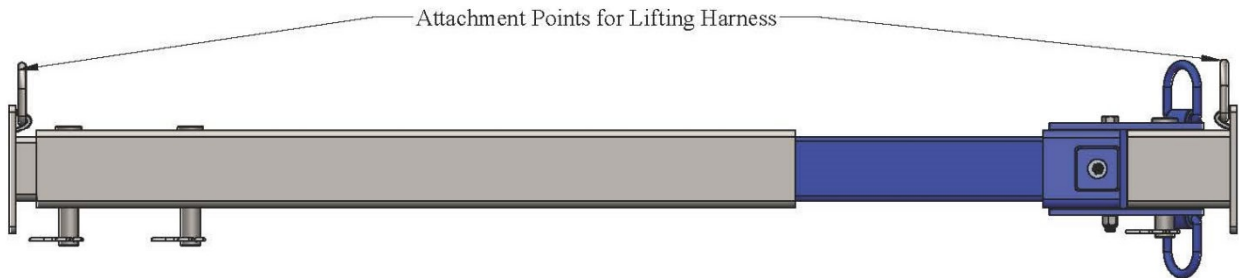


Figure 3. Side Profile View



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## Safe Handling the 6-Inch Hydraulic Strut

- Most shoring related accidents happen while setting and removing shoring equipment. There should always be a competent person trained and familiar with the shoring system being used at the site during installation.
- Prior to starting the excavation work at the shoring location, the competent person should verify that all components and their attachments, bolts, pins, hydraulic pumps, assembly equipment, etc. is present at the site.
- Develop an installation plan and hazard analysis prior to starting the work.
- Check the adequacy and condition of all lifting and rigging equipment.
- Provide safe access such as ladders for workers to enter and exit the shoring system.
- Use cables and slings for lifting that have a 5:1 factor of safety. A competent person is to determine the total lift weight.
- Confirm that dewatering is to the bottom of the excavation and that if there is a potential for water inside the excavation there is adequate pumping equipment available at the site.
- There should not be voids behind the sheeting. Backfill all voids with excavated material or small 3/8" minus rock. If the retained soil runs out from behind the sheeting it may be required to use flowable grout to seal it up.
- Check hydraulics at the start of every shift to be sure that they have not bled off.
- Monitor surcharge loading throughout the life of the shoring system installation. A competent person shall determine the proper setback for all surcharge loads over 20,000 lbs.