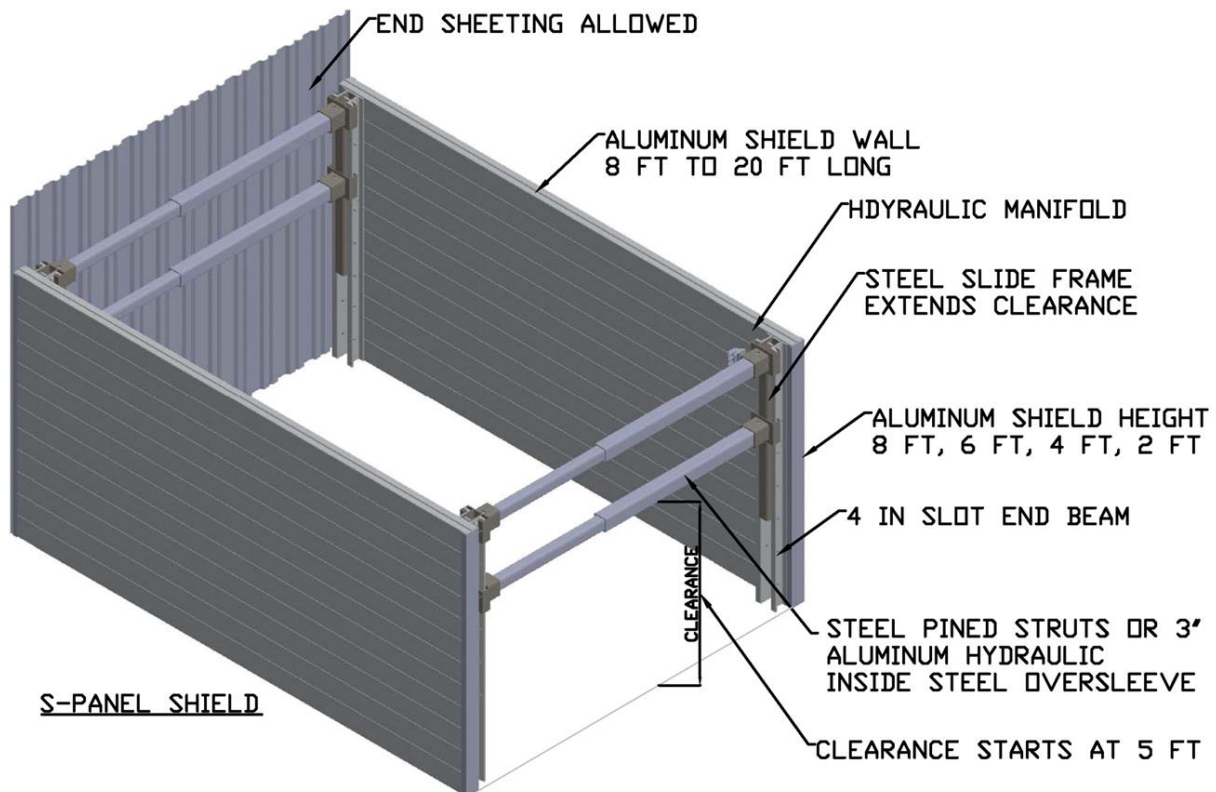


ALUMINUM S-PANEL SHIELDS

TABULATED DATA
Effective April 01, 2014



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Description

The Pacific Shoring Aluminum S Panel Shields are lightweight smooth wall shoring shields. They are easily handled with a backhoe or light excavator. These shields are constructed in 8ft, 6 ft, 4 ft, and 2 ft configurations. The 8 ft shield allows 4 to 5 ft clearance when the box is set at the bottom of the trench and up to 7 ft clearance when the shield is set 2 ft off the bottom. S Panel shields can be used with pinned struts to an allowable trench width of 12 ft, and hydraulic struts to an allowable trench width of 12 ft. S Panel shields can be end loaded with sheeting to a width of 10 ft. This shoring system is generally used in light utility work, water systems, gas and electrical duct bank installations. The optimum range of depth is 8 ft to 12 ft.

General Information for use of Pacific Shoring Aluminum S Panel Shields

1. The Aluminum S Panel Shield tabulated data presented 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, box wall, strut configuration and end condition. 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 shoring shield applications.

2. Use of this tabulated data is dependent on first classifying the soil in accordance with OSHA Appendix A, Soil Classification. Classification shall be just prior to installing the shoring shield. Soil conditions may change at a later date and require revaluation of the strength and allowable depth.

3. Aluminum S Panel Shield is tabulated based on the effect of a 20,000 lb 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, 2.2.
4. The allowable depth given in **Tables 1, 2**, governs the use of Pacific Shoring Aluminum S Panel Shields. This tabulated data applies to aluminum panel shields manufactured by Pacific Shoring, LLC.
5. Any alterations to the shields or variance from this tabulated data shall be indicated in a site-specific plan prepared and approved by a registered engineer.
6. Faces of excavations shall be vertical and the shoring walls shall be within 12 inches of the excavation wall.
7. Aluminum S-Panel Shields may be stacked or longitudinally connected. Provided they are pinned together.
8. Aluminum S Panel Shields shall be installed and removed from outside the trench, see installation and removal procedure.
9. 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 the shields.
10. Workers shall always enter, exit, and work inside the shored area of the trench.
11. Aluminum S Panel Shields may be set a maximum of 2 ft from the bottom of the excavation. The trench depth is the full distance to the bottom of the excavation.
12. Aluminum S Panel Shields may be used with wheel kits.

Classification of Soil Types

1. Soil classification shall be in accordance with OSHA Appendix A and classified just prior to installing hydraulic vertical shores. Soil conditions may change at a later date and require hydraulic vertical shores 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 the hydraulic shore.
4. Aluminum Panel Shields (APS-HR) may be used in C-80 soil provided they are dug into the excavation and not driven into the soil.
5. In C80 soil it is recommended that this equipment be utilized in site-specific plans designed by a registered civil engineer.

Aluminum S Panel Shields Allowable Depth

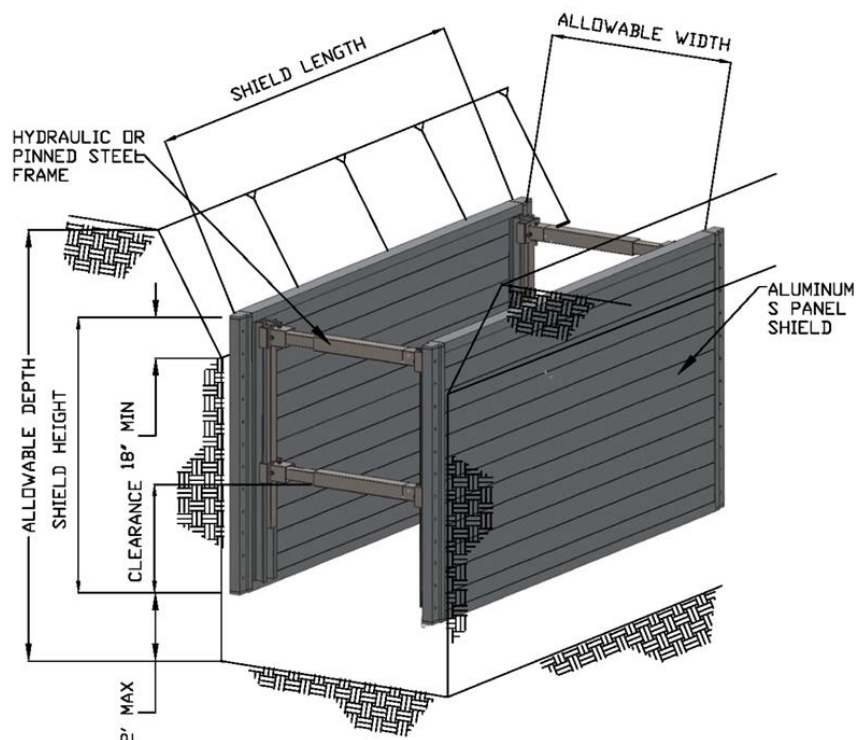


TABLE 1-S PANEL SHIELD CAPACITY and ALLOWABLE DEPTH PINNED STRUT and HYDRAULIC CONFIGURATION ^{Note 1}										
SHIELD HEIGHT 2 Ft, 4 FT, 6 FT, 8 FT								SHIELD HEIGHT		
Shield Length	Capacity	Allowable Depth				Allowable Width		Vertical Clearance ^{Note 2}		
		A-25	B-45	C-60	C-80	No End Sheeting	End Sheeting	4 FT	6 FT	8 FT
(FT)	(PSF)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(IN)	(IN)	(IN)
8	1200	20	20	20	15	12	10	24	48	60
10	1200	20	20	20	15	12	10	24	48	60
12	1200	20	20	20	15	12	10	24	48	60
14	1200	20	20	20	15	12	10	24	48	60
16	1050	20	20	18	13	12	10	24	48	60
18	850	20	19	14	11	12	10	24	48	54
20	700	20	16	12	9	12	10	24	48	54
Notes										
1. 8x18 and 8x20 shields require 2 -3" hydraulic cylinders in the lower position										
2. When shield is held 2 ft off bottom the vertical clearance is an additional 24 "										

Table 1 Notes

1. S Panel shields may be stacked
2. In sloped excavations the maximum depth is 20 ft before site specific engineering is required
3. Shields may be held 2 ft off the bottom of the excavations in OSHA Type A and B soil only
4. Pipe clearance is increased by 2 ft in Type A and B soil if the shield is held 2 ft off the bottom
5. In sloped excavations, slope in accordance with OSHA Soil Type as follows;

Type A	¾:1
Type B	1:1
Type C	1-1/2:1
6. In sloped excavations the hinge point must be minimum 18" below the top of the shield
7. In hydraulic mode all struts are to be pressurized to 750 psi and the shield walls must be in contact with the soil. Static Mode is when the struts are pinned or not pressurized against the trench wall.

Aluminum S Panel Shields End Sheeting

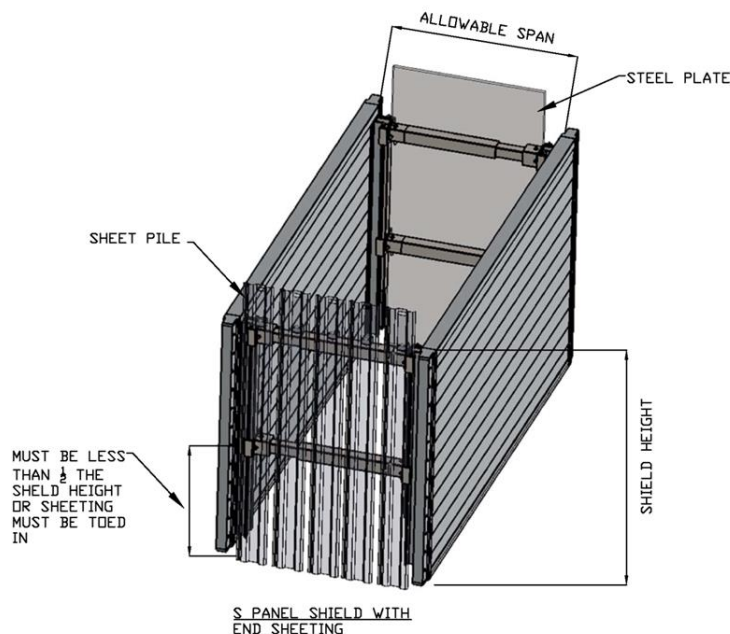
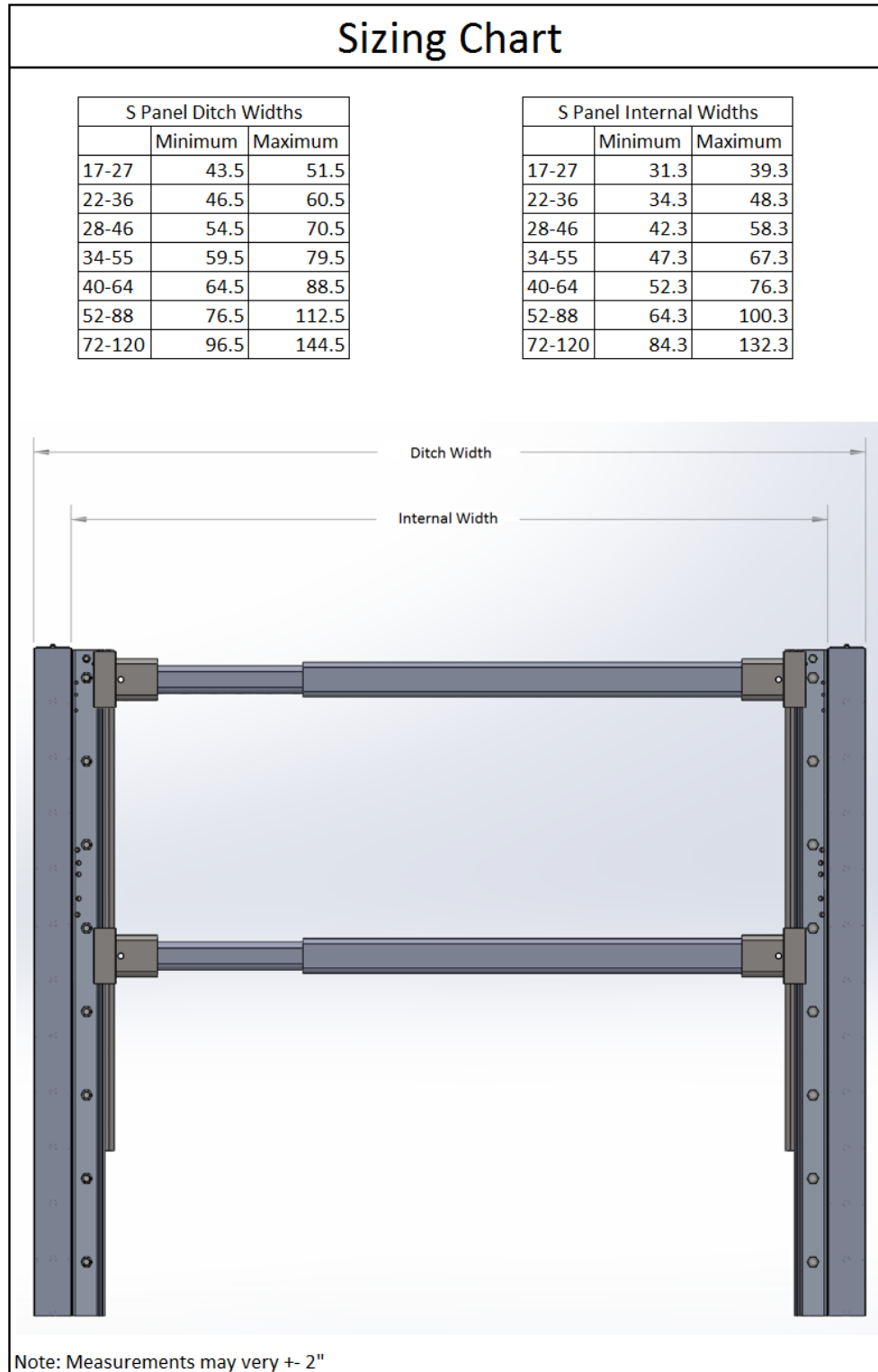


TABLE 2-SHEETING				
Shield Length (FT)	Allowable Span (FT)	Toe In Requirements		
		A-25 (FT)	B-45 (FT)	C-60 (FT)
8	10	1	2	2
10	10	1	2	2
12	10	1	2	2
14	10	1	2	2
16	10	1	2	2
18	10	1	2	2
20	10	1	2	2
Note-Additional span width may be achieved by adding more spreaders. Additional engineering is required.				

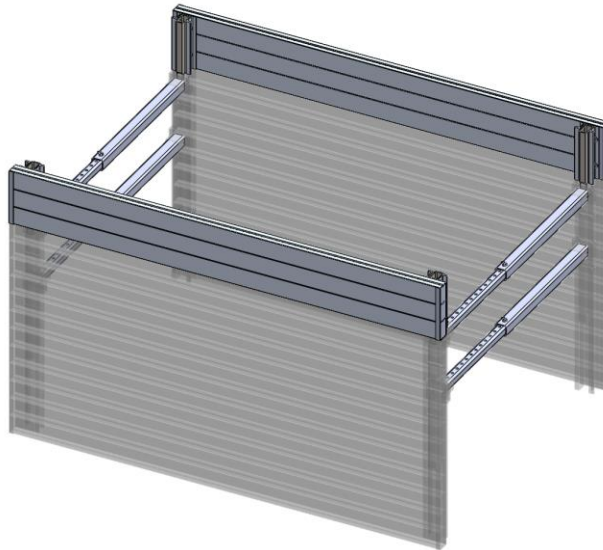
Table 2 Notes

1. If the bottom spreader is set more than $\frac{1}{2}$ the shield height the sheeting must be toed in.
2. Sheeting may be aluminum or steel sheet trench sheeting with minimum section modulus $s=4$ in³/ft, steel plate minimum $\frac{1}{2}$ " thick, or any other sheeting that is tabulated for the spans greater than 4 ft in C-60 soil.
3. Sheeting must be installed prior to workers entering the excavation.

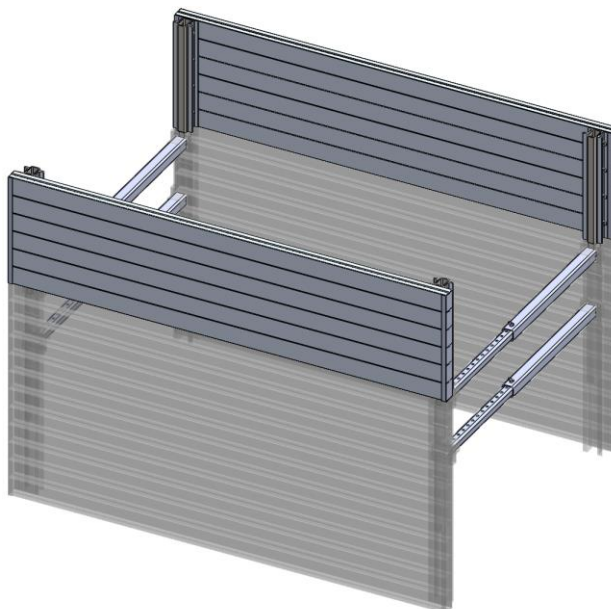
Aluminum S Panel Shields Sizing Chart



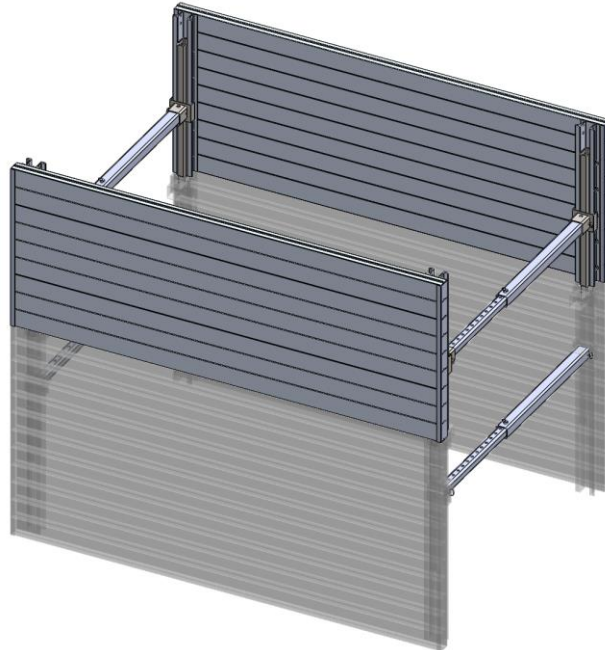
Aluminum S Panel Shields Stacked Configurations



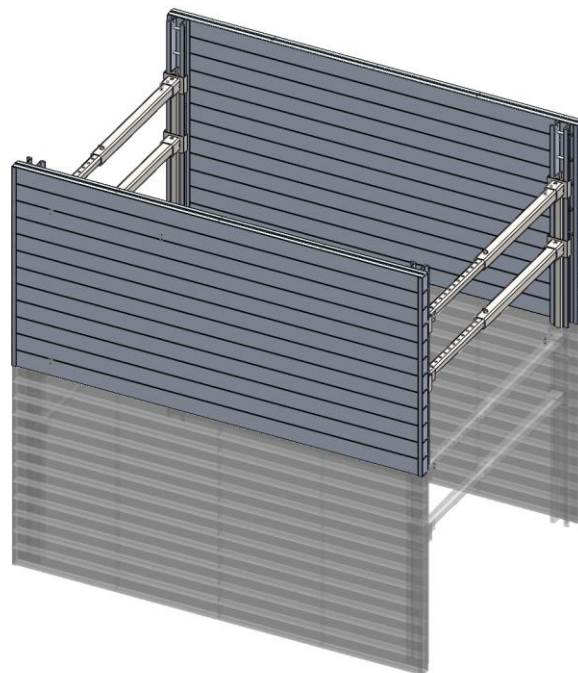
2ft Stacker Panel installed using standard slide rail and 2ft plain slide rail extension



4ft Stacker Panel installed using standard slide rail and 4ft plain slide rail extension



6ft Stacker Panel installed using standard slide rail and 5ft socketed slide rail extension



8ft Stacker Panel installed using standard slide rail and 6ft socketed slide rail extension

Aluminum S Panel Shields -Table 4-Shield Weights

TABLE 4- S PANEL APPROXIMATE SHIELD WEIGHT											
Length (FT)	Depth (FT)	Weight (LBS)	Length (FT)	Depth (FT)	Weight (LBS)	Length (FT)	Depth (FT)	Weight (LBS)	Length (FT)	Depth (FT)	Weight (LBS)
8	2	741	8	4	1874	8	6	2529	8	8	2895
10	2	830	10	4	1158	10	6	2797	10	8	3220
12	2	920	12	4	1158	12	6	3066	12	8	3545
14	2	1009	14	4	1158	14	6	3334	14	8	3871
16	2	1098	16	4	1158	16	6	3602	16	8	4196
18	2	1188	18	4	1158	18	6	3871	18	8	4521
20	2	1277	20	4	1158	20	6	4139	20	8	4846
Based on 8 ft spreader width											

Table 4 Notes

1. Use a factor of safety of 5 for rigging cables and connections
2. Shield weights are approximate. If the shield is wedged in, the lifting force will be higher than tabulated weight.

Aluminum S Panel Shield Installation and Removal

Installation

1. Shields shall be assembled and properly rigged for lifting prior to setting inside the excavation.
2. Set shield inside the trench. Workers are not allowed under moving loads at any time.
3. If trench walls are more than 6" from the wall of the shield, back fill the void with crushed rock or excavated soil a minimum of ½ the shield wall area.
4. If the shield is held 2 ft off the bottom of the trench, the bottom of the shield shall rest on a bench or be otherwise supported so that it cannot fall to the bottom of the trench.

Removal

1. If shields are stacked attach lifting equipment to the bottom shield prior to removing the top shield
2. If the shield is wedged in by soil, the additional pulling force may exceed the strength of the lifting harness or the connection of the lifting eyes. Use extreme caution when forcing shields out of an excavation.

Safe Handling and Use of Aluminum Panel Shields

1. A competent person shall inspect the shield on a daily basis while it is in use in the trench. Check for;
 - Lift hooks are properly connected and holes are not rounded or bent
 - Check for broken welds at all weld locations
 - Check strut pins for safety lock pin in place, and excessive wear
 - Check strut pin holes for elongation or tearing.
 - Check strut to make sure it is not bent or dinged
 - Workers may be inside the shield when it is being moved horizontally but not when it is being lifted.
 - Workers shall stay back minimum 10 ft when a shield is wedged inside an excavation and being lifted with force to get it out of the excavation.
 - If shields need repairs, the shield shall be taken out of service until it is re-certified by a Registered Civil Engineer.