

Arch Spreader System

Hazard and Risk Assessments

Before using this equipment, the job you are doing must be assessed for foreseeable hazards and risks and appropriate measures to eliminate, control or reduce those risks must be taken before you commence work.

Suggested PPE (Personal Protective Equipment):



Protective Gloves Protective Footwear Hard Hat Eye Wear

Note: PPE must be suited to the risks and person(s) using the equipment.

Safety Instructions:

1. **Operating Instructions** – Before using this equipment ensure you have read the 'Operating Instructions' and taken note of the 'Hazards and Risks' detailed on this instruction sheet and taken all necessary steps to prevent injury.
2. **Personal Protective Equipment** – Use appropriate personal protective equipment for the job.
3. **Installation Advice** – The safe use and application of this equipment must be in accordance with AS3610, the Occupational Health and Safety Act, approved Codes of Practice and any other regulatory requirements. Consultation with a qualified engineer is advised.
4. **Excavator Lifting Capacity** – Always ensure excavator/crane lifting capacity is sufficient to lift, install & remove trench boxes, allowing for soil friction/suction loads.
5. **Lifting Chains** – Ensure lifting equipment has sufficient capacity.

HAZARD: Risk of Collapse, Crushing, or Falling

... Incorrectly installed or rated trench boxes and shields systems may fail or cause trench collapse.

... Consultation with a qualified engineer is advised.

Arch Spreader System

The Shore Hire Arch Spreader System can be also be described as High Clear Struts or High Clearance Struts. Arch Spreaders are used when higher clearance under the lower strut in a shoring box is required, and usually at wider than normal excavations. Laying of large pipes or culverts usually need high clearance.

Arch Spreader Posts are pinned to the shoring box via the existing 2 x spigots on each lower panel, and to gain extra width, Arch Spreader Spacer Beams are bolted between the 2 posts.

Installation of trench boxes/shields can require site preparation depending on the job requirements. It is critical to understand the capabilities and regulations' governing the use of trench boxes/shielding before you use them.

Shore Hire supplies different systems depending on the size of the excavation and ground conditions encountered. Always ensure that the system you have selected is suitable for the ground conditions on your site and the equipment to be used.

Inspection

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

Safety Recommendations

- A) A competent person needs to understand the regulations relating to OH&S and the Excavation Code of Practice and determine proper protective system requirements.
- B) Ensure that all personnel are wearing proper personal protection equipment.
- C) Always make sure lifting equipment is adequate for the task and meets OH&S requirements. Please note that tie-down chains and other improvised slings are not appropriate as lifting devices.
- D) Depth Operation – each trench shield is designed to a maximum shield capacity in KPa (Kilopascals per square meter) load. Care must be taken to ensure maximum ground loading capacity is not exceeded. Consult an engineer if in doubt.
- E) Include surcharge load in your ground load calculations when determining your shoring requirements. Surcharge loads could include:

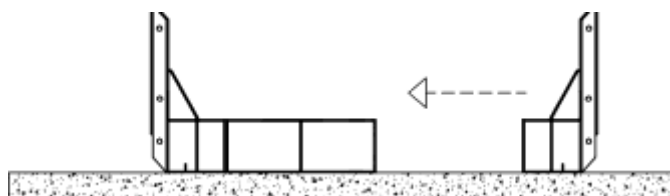
1) SITE TRAFFIC	4) NEARBY BUILDING
2) ADJACENT TRAFFIC	5) EXCAVATOR OR CRANE
3) EXCAVATED SPOIL FROM THE EXCAVATION	
- F) Keep both the machine and the shield away from soft ground around the excavation. If excavating in very soft ground make sure you have a machine with enough reach, so as not to be putting surcharge load on top of the excavation.
- G) It is suggested that you read the Trench Boxes, Shields & Manhole Boxes Operating Instructions in conjunction with this (Arch Spreader) Operating Instructions.

Assembly

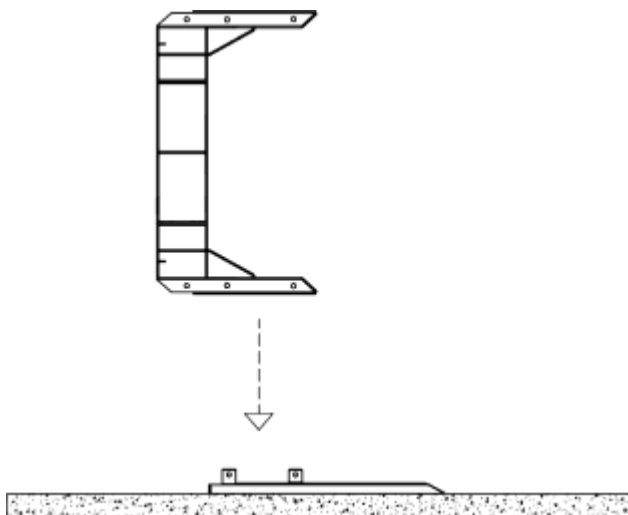
1. Before commencement, determine the required internal clearance of the Trench box and the width of the excavation.
2. Determine if an Arch Spreader is required at one end or both ends of the Trench Box.
3. If Arch Spreader Posts & Spacer beams need to be assembled, place first Post on 2 x timbers upside down ie with the spigot connector side pointing upwards & the beam connector flange

sideways (see Step 1). Place the Spacer Beam on timbers and insert NBW's through both Beam Connector Flanges and tighten. Repeat this step if multiple Spacer Beams are required. ALWAYS ASSEMBLE WITH SMALLER SPACERS ON THE OUTSIDE ie LOCATE LARGER/LONGER SPACER BEAMS IN THE CENTER. Safely lift the other Arch Spreader Post onto the last Spacer beam and insert & tighten the NBW. Ensure that all NBW are installed and tightened correctly. ALWAYS ensure that the assembly is adequately supported to stop it falling over.

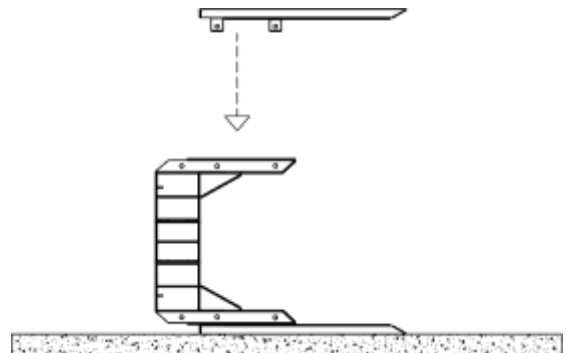
4. Lay Trench Box Panel on flat ground with Spigots facing upwards in clear area to allow adequate work area. Lift Arch Spreader Assembly over Trench Box Panel Spigots and insert pins & clips when in position (Step 2). Ensure Beam is at top of Panel and that timber supports are placed under the post above panel. Depending on requirements, install other Arch Spreader on other side of panel if required, or lift and place correct length Shore 168 Struts onto Spigots & insert Pins & Clips.
5. If less than 1750mm Internal, lift the second panel to connect the other side to the Arch Spreader Struts and/or the Shore 168 Struts depending on requirements (Step 3A). If box is wider than 1750mm, lift panel with Arch Spreader attached and rotate and place onto the other panel (Step 3B).
6. Lift the assembled trench box to an upright standing position (Step 4A & 4B).



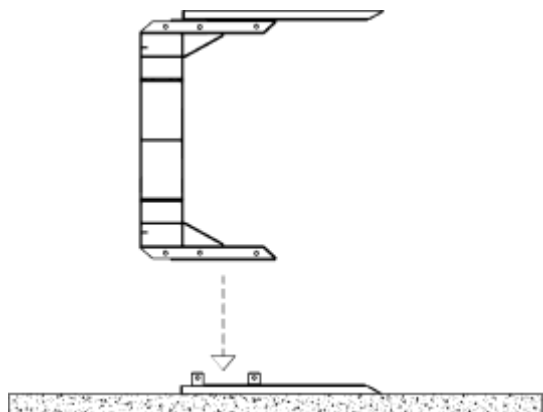
STEP 1: ARCH SPREADER ASSEMBLY



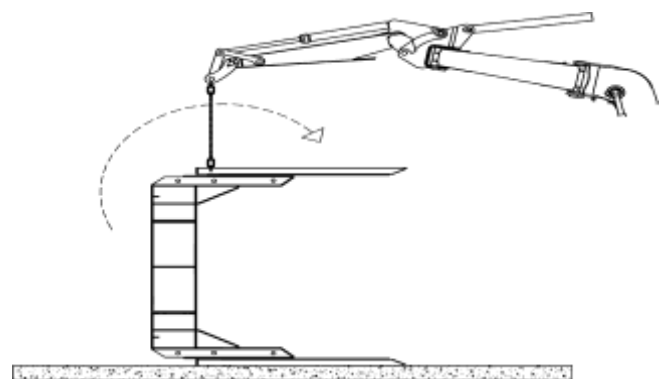
STEP 2: CONNECT ARCH SPREADER TO PANEL



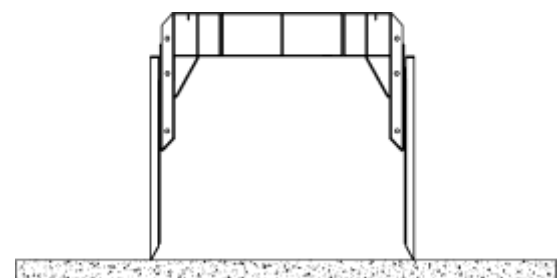
STEP 3A: FOR UNDER 1750mm WIDE



STEP 3B: FOR OVER 1750mm WIDE



STEP 4A: LIFT LOWER UNIT



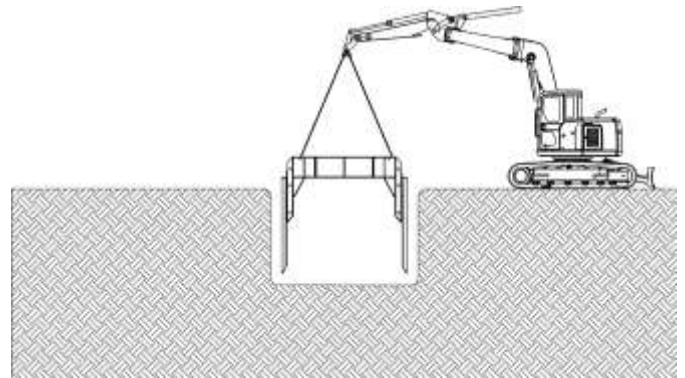
STEP 4B: STAND UP LOWER UNIT

Fitting Upper Extensions to Steel Boxes

1. Assemble the upper extension module using the same method used to assemble the lower shield but using Shore 168 Struts only. Arch Spread Posts & Beams are not used in Upper Units.
2. Then fit the four connector blocks to each connector socket/eye with pins and clips.
3. Lower upper extension onto the lower Trench Box, ensuring that the connectors are located in the correct sockets/eye.
4. Then fit and secure the locating pins into the connectors through the socket/eye on the lower Trench Box, and fit clips into pins. This can only be done from the inside of the trench box.
5. Insert Lower Strut pins into Arch Spreader through the Spigot if necessary. (some upper units may not have spigot at bottom of panel)

Installation

1. In good soil conditions, dig excavation to desired depth and ensure width & length of excavation will fit Trench Box (see Step 1). Check that excavator or crane is working within lifting capacity.
2. Using only designated lifting points, connect lifting chains and lift lower unit and install into excavation (see Step 2)
3. If necessary, Upper Trench Box unit can be now be installed (or it can be installed in conjunction with Lower Trench Box Unit).
4. To move Trench Box to other part of trench, repeat steps 1-3

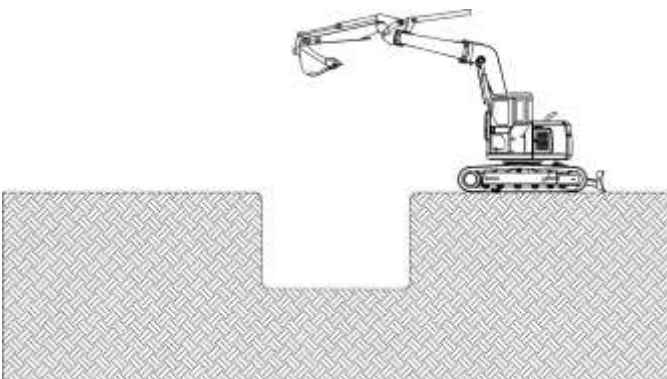


STEP 2: INSTALL LOWER UNIT INTO EXCAVATION

Extraction

Due to the consolidation of the ground around the shoring box, the combination of ground pressure and friction will make it more difficult to remove the Trench Box/Shields than it was to install them. It may be necessary to use a combination of the following methods:

1. Always ensure that excavator or crane lifting capacity is not going to be exceeded.
2. In normal ground conditions, attach a four-legged lifting chain to each lifting eye and steadily pull the box clear. This is possible in stable ground conditions.
3. In difficult ground conditions, attach a two-legged lifting chain to the lifting eyes of one side of the trench box and lift this panel slightly. Do not exceed the pivoting movement of the struts. Repeat for the opposite panel again taking care not to exceed the maximum strut movement. Repeat this procedure until the shield is free enough to be lifted clear using four legs of lifting chains.
4. Under extreme ground pressure it may be necessary to fit a Shore Hire straight-leg chain to one lifting eye and work that corner free. Repeat this procedure for the other corners until the shield is free then use four-legged chain to complete extraction.



STEP 1: EXCAVATE TRENCH

Tabulated Data (Note: wider widths will require Engineering Consultation)

Description	Max. Internal Width	1 x Arch Spreader @ 1500mm Int.	2 x Arch Spreader @ 1500mm Int.	1 x Arch Spreader @ 6500mm Int.	2 x Arch Spreader @ 6500mm Int.	Clearance below Struts	Safe Working Load
Shore 4m/60 Lower	6500mm	3390 kg	3860 kg	4326kg	4860kg	2500mm	60 KPa
Shore4m/60Upper	6500mm	2042 kg	2042 kg	2914 kg	2914 kg	Not applic.	60 KPa(>4m=40KPa)
Shore 6m/40 Lower	6500mm	5514 kg	5984 kg	6450 kg	6984 kg	2500mm	40 KPa
Shore6m/40Upper	6500mm	3868 kg	3868 kg	4740 kg	4740 kg	Not applic.	40 KPa(>4m=40Kpa)

SCAN ME FOR TECH DATA



RISK ASSESSMENT (1= HIGH RISK, 5 = LOW RISK)

Risk (Ranking)	Description	Control
1	Installing shoring shields in unstable/shifting ground could cause personal injury.	Always ensure no person enters the shield during installation
1	Overloading the stated capacity of the shield could create possible collapse of the shield.	Strictly follow the engineers advice, do not overload the capacity of the shoring shield.
2	Installing trench boxes different to operating instructions may cause systems to fail.	Adhere to engineering & Operating instructions to ensure shields are only installed in the correct manner
3	Cuts & grazes may occur from improper handling procedure.	Observe safety procedures always wear protection.
1	Work within trench box at all times or trench collapse could cause injury/death.	Never move outside the trench box while working.
1	When assembling Arch Spreader System & Trench Boxes, loads could shift or move suddenly causing serious injury or death.	Never stand under load, and always stand well clear when assembling components and carrying out installation.