



Trench Boxes, Shields and Manhole Boxes

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:

- 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.
- Personal Protective Equipment** – Use appropriate personal protective equipment for the job.
- 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.
- Excavator Lifting Capacity** – Always ensure excavator/crane lifting capacity is sufficient to lift trench boxes, allowing for soil friction/ suction loads.
- Lifting Chains** – Ensure lifting equipment has sufficient capacity.
- Transport** – Ensure equipment is clean from debris prior to transporting.

HAZARD: Risk of Trench Collapse and Crushing

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

... Consultation with a qualified engineer is advised.

Trench Boxes

Trench boxes and shields have many different names for the same protective system.

Trench shielding comes in a variety of sizes and shapes but basically it is composed of the panels made from steel or aluminium held apart by steel struts at both ends, and held in position with pins and clips.

Installation of trench shielding can require site preparation depending on the job requirements. It is critical to understand the capabilities and regulations governing the use of trench 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.

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 competent person needs to understand the regulations relating to OH&S and the Excavation Code of Practice and determine proper protective system requirements.
- Ensure that all personnel are wearing proper personal protection equipment.
- 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.
- Depth Operation** – each trench shield is designed to a maximum shield capacity in K.P.A load. Care must be taken to ensure maximum capacity is not exceeded.
- Include surcharge load in your calculations when determining your shoring requirements. Surcharge loads include:

1) SITE TRAFFIC	4) NEARBY BUILDING
2) ADJACENT TRAFFIC	5) EXCAVATOR OR CRANE
3) EXCAVATED SPOIL FROM THE EXCAVATION	
- 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.

Assembly

- Determine the width of the excavation then select the required struts and panels to meet the depth of your excavation.
- Place a panel on flat ground with strut connecting points facing up and connect struts using pins and clips supplied (See Step 1).
- Lift the second panel to connect the other side to spreader struts and connect with pins and clips (See Step 2A and 2B).
- Then lift the assembled trench box to an upright standing position (See Step 3).

Fitting Upper Extensions to Steel Boxes

- Assemble the upper extension module using the same method used to assemble the lower shield.
- Then fit the four connectors blocks to each corner connector socket with pins and clips.
- Lower upper extension onto the lower shoring shield, ensuring that the connectors are located in the connector sockets.
- Then fit and secure the locating pins to the lower shoring shield, and fit clips into pins.

Installation

- 1) In good firm ground conditions, dig to desired depth and install trench box (and extension if required) (See Step 1A and 1B).
- 2) In sandy conditions, dig a starter excavation before lowering the shield into position. Then commence excavating inside the box gently digging below the bottom edge of the shield, then push the shield down on alternate corners and repeat until required depth is reached (See Step 2A and 2B).

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 shields than it was to install them. It may be necessary to use a combination of the following methods.

- A) 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.
- B) 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.
- C) 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.

Tabulated Data

HD ALUMINIUM TRENCH BOX

Description	Max Internal Width	Minimum Weight	Clearance Below Struts	Safe Working Load
Shore 4.2m Knife Edge	4260mm	2300kg	1450mm	60KPa
Shore 4.2m Flat Bottom	4260mm	1880kg	860mm	60KPa
Shore 6.2m Knife Edge	4260mm	3300kg	1450mm	40KPa
Shore 6.2m Flat Bottom	4260mm	2690kg	860mm	40KPa
Shore 7.2m Knife Edge	4260mm	3800kg	1450mm	36KPa
Shore 7.2m Flat Bottom	4260mm	3000kg	860mm	36KPa

STEEL SHORING BOXES

Description	Max Internal Width	Minimum Weight	Clearance Below Struts	Safe Working Load
Shore 3M/30 Lower	4000mm	850kg	1200mm	30KPa
Shore 3M/30 Upper	4000mm	656kg	N/A	30KPa
Shore 3M/60 Lower	4000mm	1320kg	1200mm	60KPa
Shore 3M/60 Upper	4000mm	826kg	N/A	60KPa
Shore 4M/60 Lower	4000mm	2840kg	1500mm	60KPa
Shore 4M/60 Upper	4000mm	1962kg	N/A	60KPa
Shore 6M/40 Lower	4000mm	4964kg	1500mm	40KPa
Shore 6M/40 Upper	4000mm	3788kg	N/A	40KPa

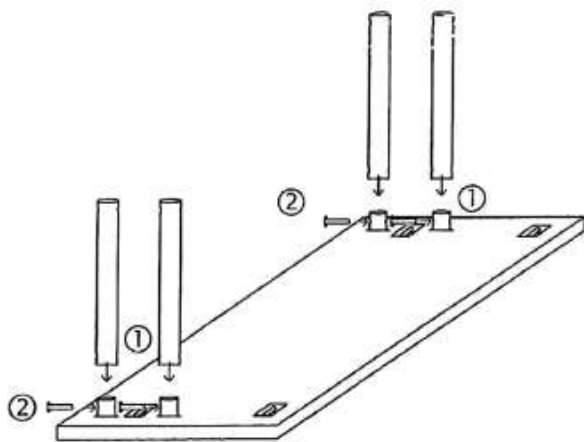
SHORE MANHOLE BOX

Description	Max Internal Width	Minimum Weight	Clearance Below Struts	Safe Working Load
Shore 3M/50 Manhole Lower	4000mm	2472kg	1500mm	50KPa
Shore 3M/50 Manhole Upper	4000mm	1762kg	N/A	50KPa

Assembly

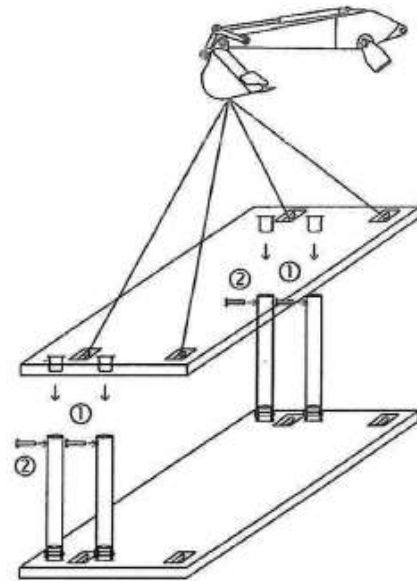
STEP 1: TRENCH SHIELD ASSEMBLY

Lay panel flat on the ground with spreader sockets pointed up. Place spreader pipes onto sockets (1) and pin into place (2). Be sure to secure pins with keepers.



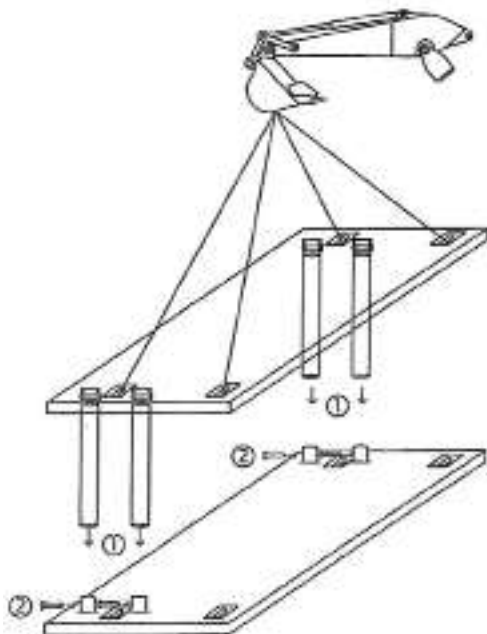
STEP 2A: FOR SPREADER UNDER 1750MM

Using lifting eyes and chains, lower second panel onto spiggots (1) and pin into place (2).



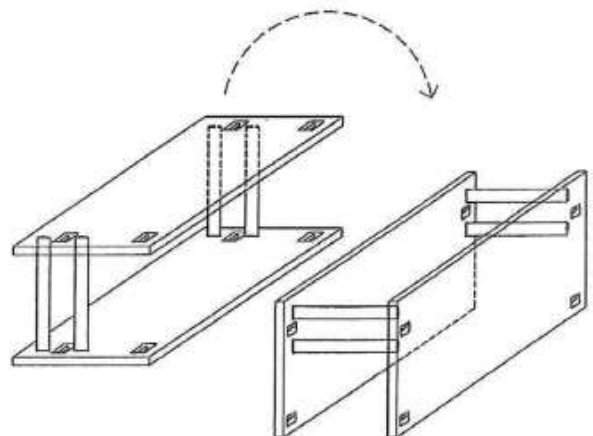
STEP 2B: FOR SPREADER OVER 1750MM

Using lifting eyes and chains, lower panel onto spiggots onto second panel (1) and pin into place (2).



STEP 3

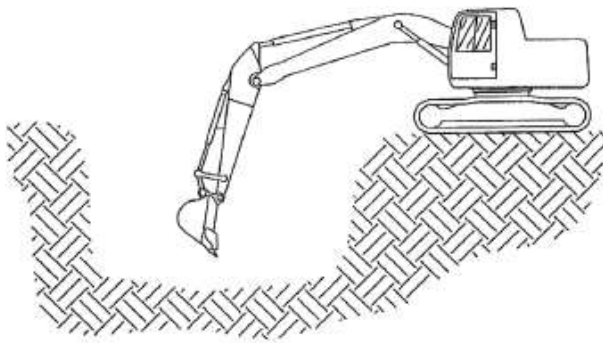
Stand trench shield in upright position and prepare for installation.



Installation

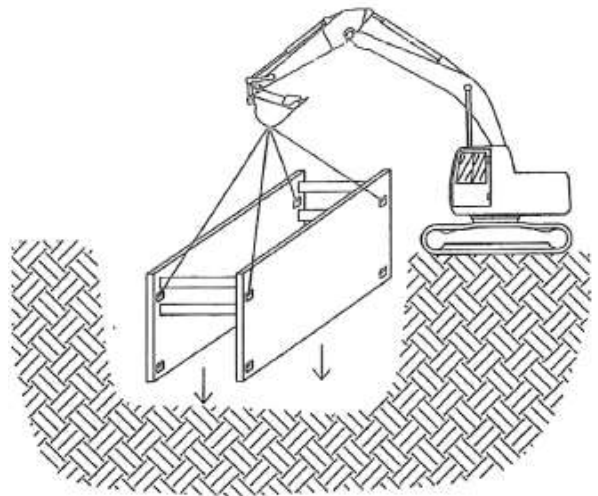
STEP 1A: TRENCH SHIELD INSTALLATION (STABLE SOIL)

Excavate to grade just slightly wider than trench shield width, dig walls vertical to minimum of 500mm below the top of the shield. Slope soil above shield according to the job requirements.



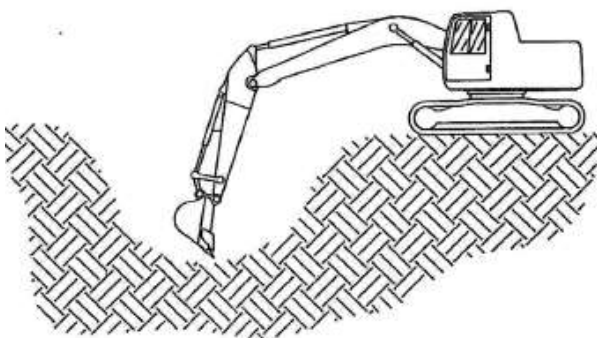
STEP 1B

Lower shield into trench, backfill between outside wall of shield and wall of trench before use.



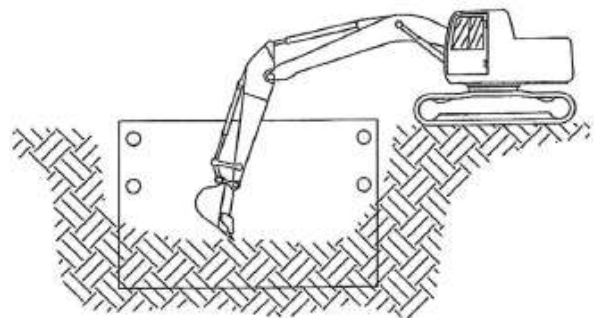
STEP 2A: TRENCH SHIELD INSTALLATION (UNSTABLE SOIL)

Excavate until soil begins to slide beyond desired trench width. Place shield in excavation.



STEP 2B

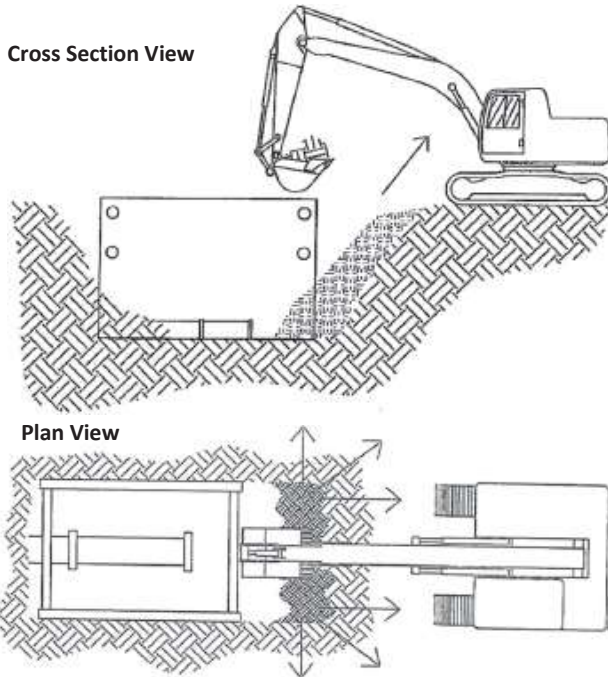
Press down on shield as far as possible, excavate soil within shield and repeat as necessary until desired trench depth is achieved.



Moving Trench Boxes

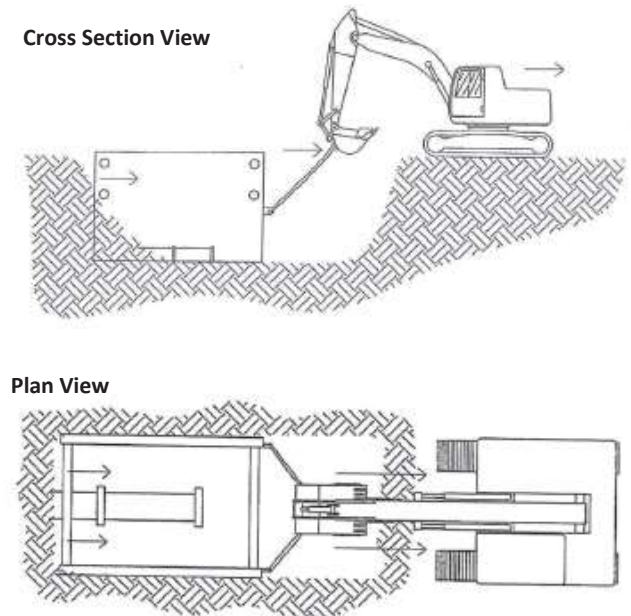
STEP 1: MOVING TRENCH BOX

Excavate area where trench box is to be moved.



STEP 2: MOVING SHIELD

Pull box forward with pulling slings or by leapfrogging rear box to the front of the last box. Backfill behind box.



SCAN ME FOR TECH DATA



HD. Aluminium



Steel shoring



LD. Aluminium

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 instructions to ensure shields are only installed in the correct manner.
3	Cuts and 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.