

PRODUCT USER GUIDE

MODULAR SHORING



Introduction

This booklet is intended to provide basic information for users of the Mabey Hire PTY Ltd Aluminium Modular Shoring system and to draw the client's attention to the practical aspects of Aluminium Trench Shields operational procedures and basic maintenance which need to be considered when compiling method statements, risk assessments and safe system of works. It is assumed that clients are familiar with general safe practices applicable to this type of work.

Modular Aluminium Panels are engineered for high strength, ultra-light weight, and ease of handling. The system is ideal for utility maintenance and repairs to cable splice pits, plumbing repairs, gas, sewer, water, and other light utility installations. Modular panels, end post, and adjustable spreaders are light enough for transport by a utility vehicle, and can be quickly configured for 2, 3 or 4 sided applications. A two-man crew can readily assemble the system by hand for rapid placement in the trench by a backhoe or small excavator.

Aluminium shoring systems are not normally suitable for use in water bearing soils or in trenches crossed by frequent services. Modular Shoring systems should not be used in seawater applications without prior consultation with the Mabey Hire PTY Ltd, Engineering Department.

It is advisable, before commencing installation, to read the notes below and to become familiar with the procedures involved when using the Aluminium Modular Shoring System.

Configuration Available

- ▶ 2-Sided Trench Box
- ▶ 3-Sided Trench Box
- ▶ 4-Sided Trench Box

IMPORTANT NOTES

All excavation work must be thoroughly planned before work commences on site to identify hazards and assess risk.

These instructions form guidance for the typical installation of Trench Box Equipment. Non-standard applications should be approved by a suitably qualified engineer.

Ensure all personnel engaged in installation operations are properly briefed and adequately supervised by a competent person,

All hire for this equipment will usually be accompanied by a general arrangement or scheme specific drawing. This must be read in conjunction with these instructions.

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Contents

1. General Guidance Notes

▶ Safe System of Work and Method Statement	3
▶ Access, Hard standing Areas and Site Storage	3
▶ Personnel.....	3
▶ Plant and Lifting Equipment.....	3
▶ Sling Warning	3
▶ Small Plant, Tools, and Lifting Chains.....	3
▶ Access & Egress and Edge Protection.....	3
▶ During Installation Works	3
▶ After Installation Works	3
▶ Return of Equipment Off-Hire.....	3

2. Component Identification

▶ Modular Panels.....	4
▶ 2 & 3-way Corner Post	4
▶ Strut Details	5
▶ Modular Shoring Accessories	5
▶ Protection Components	5

3. Box Configuration.....6

▶ 2 Sided Box	6
▶ 3 Sided Box	6
▶ Square Box.....	7
▶ 3-Way Post Box.....	7

4. Before Installation.....7

5. Typical Site Assembly - Lifting & Installation.....8

▶ 2 Sided Box	8
▶ 3 Sided Box	9
▶ Square Box.....	10

6. Extraction of a Modular Shoring Box.....11

7. General

▶ Basic Maintenance	11
▶ Do's & Don'ts	11

1. General Guidance notes

Safe System of Work

Assuming that the appropriate Aluminium Modular Panels have been selected for use, the Health and Safety at Work Act requires that a safe system of work be adapted to carry out the works on site.

These guidance notes are intended to draw the client's attention to practical aspects of Mabey Hire Pty. range of Aluminium Modular Panels components during use and basic maintenance which need to be considered when completing method statements for a safe system of work.

Access, Hard standing Areas and Site Storage

- Suitable firm, level, dry areas should be made available on-site for storage and pre-assembly work.
- Suitable lifting equipment of adequate capacity should be provided for off-loading and installation.
- The weights of components and assemblies are given in this guide.
- Large components should be stacked, nested with suitable timber dunnage, max 3no panels per stack.
- Smaller components should be stored in skips/bins.

Personnel

The Management of Health and Safety at Work Regulations require that personnel deployed are suitably trained, experienced, and supervised by a competent person.

The main activities associated with Aluminium Trench Shields use are:

- Unloading and loading the delivery vehicle.
- Pinning components together.
- Slings and lifting the Aluminium Trench Shields into and out of the trench.

Plant and Lifting Equipment

A suitable appliance is required for off-loading, installation, and re-loading of equipment, together with lifting chains, available from Mabey Hire Pty Ltd., of suitable length and capacity and with current certification.

WARNINGS:

- If Aluminium Modular Panels components are to be lifted in or around an excavation, the appliance should be located at a safe distance from the edge of the excavation and the lifts checked against the safe lifting capacities of the appliance. A surcharge for the appliance must have been allowed for in the excavation

brief/design.

- No more than one assembled component must be lifted at a time.

Sling Warning

If a sling is to be used on a backhoe, be aware of the following:

- It is very important that a means of allowing the sling to swivel to be introduced above the master (top) ring. This will allow the sling, and in particular, the master ring, to turn and align with the load.
- Without a swivel arrangement, the load may severely twist the master ring, resulting in damage or failure.
- All lifting accessories attached to the excavator lifting point must hang freely and be free to move at all times.

Small Plant, Tools, and Lifting Chains

- Lifting Chains of suitable length and capacity complete with current certification. Typically for Aluminium Trench Shield a set of 4 legs 10mm chains with 4m leg length.

Access & Egress and Edge Protection

- Install the edge protection as soon as possible before entering into the excavation.
- A competent person should inspect the means of access and egress regularly.

During Installation Works

- Check that all bolted connections remain tight.
- Check that all pinned connections are intact and complete with an 'R' clip, where required.
- Avoid striking equipment or loading it inappropriately.

After Installation Works

Each excavation must be inspected daily before personnel beginning work.

Return of Equipment Off-Hire

- Clients should ensure that on removal, the equipment is returned clean and assembled as supplied.
- Ensure all equipment is loaded to the satisfaction of the vehicle driver and is securely restrained to the vehicle bed.

Component Identification

2.1 Modular Panels

Panel Height (mm)	Panel Length (mm)	Weight (kg)
610	914	22.7
610	1219	27.2
610	1829	40.8
610	2438	54.4
610	3048	63.5



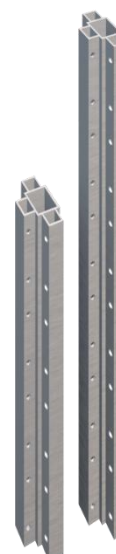
2.2 Corner Post

Post Model	Post Height (mm)	Weight (kg)
MC 48	1219	17.2
MC 72	1829	25.4
MC 96	2438	34.0



2-Way Corner Post

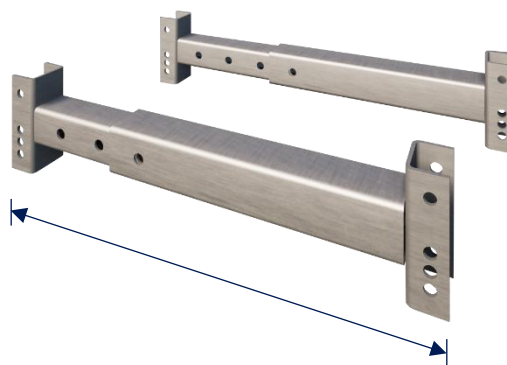
Post Model	Post Height (mm)	Weight (kg)
MC 48	1219	23.1
MC 72	1829	34.5
MC 96	2438	45.8



3-Way Corner Post

2.3 Strut Details

Post Model	Min. Length (mm)	Max. Length (mm)	Weight (Kg)
TS 18-26	457	660	49
TS 23-34	584	863	58
TS 28-44	711	1117	70
TS 34-54	863	1372	83
TS 42-66	1067	1676	102
TS 52-88	1321	2235	124



2.4 Modular Shoring Accessories



Single Corner Lifting Point

Weight: 5 kg



Double Corner Lifting Point

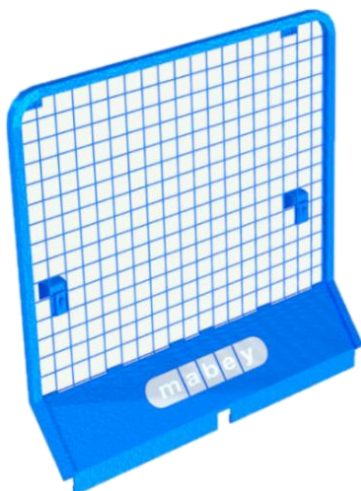
Weight: 7kg



Connector Pin & "R" Clip

Weight: 0.1 kg
Dimensions: ø12mm
Shank x 90mm Long

2.5 Protection Components



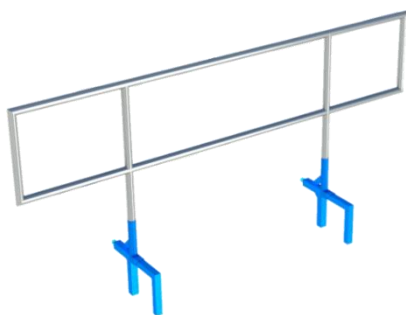
Sheet Guard Barrier
Weight: 21.5 kg



Access Platform
Weight: 110 kg

PRODUCT USER GUIDE

MODULAR SHORING



Aluminum Handrail

Length	2.0m	2.4m	3.0m	4.0m
Weight	13.5 kg	14.5 kg	19.8 kg	21.6 kg

*Adjustable Clamping included in the weight (4.0km)



Davit Arm
Weight: 42 kg

3. Box Configuration

2 Sides Box

Panel Length (mm)	Safe Working Load	Max. Strut Length (mm)
914	88 kPa	2234
1219	66 kPa	
1829	44 kPa	
2438	33 kPa	
3048	25 kPa	



Maximum Under strut
clearance: 0.9m

Bottom panel may be
omitted, allowing 2
feet open

3 Sides Box

Panel Length (mm)	Safe Working Load	Max. Strut Length (mm)
914	44 kPa	1830
1219	44 kPa	
1829	44 kPa	
2438	33 kPa	
3048	25 kPa	



Maximum Under strut
clearance: 0.9m

Bottom panel may be
omitted, allowing 2
feet open

4 Sides Box

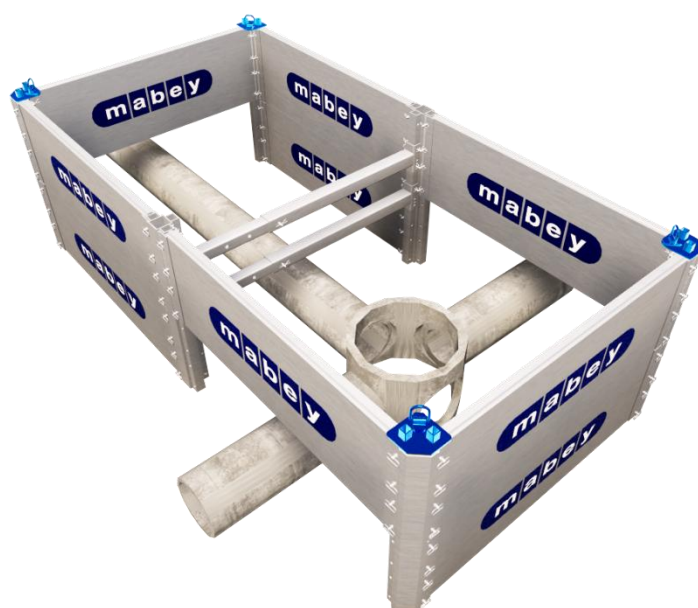
Panel Length (mm)	Safe Working Load	Max. Wide End Panel (mm)
914	25 kPa	3048
1219	25 kPa	
1829	25 kPa	
2438	25 kPa	
3048	25 kPa	

Maximum Under strut clearance: 0.9m

Bottom panel may be omitted, allowing 2 feet open



3-Way Post- Box



Panel Length (mm)	Safe Working Load	Max. Strut Length / End Panel (mm)
914	44 kPa	1830
1219	44 kPa	
1829	44 kPa	
2438	33 kPa	
3048	25 kPa	

Maximum Under strut clearance: 0.9m

4. Before Installation

Maximum Depth

Generally Suited to a lower and upper box assembly configuration. However, depending upon ground conditions and installation methods, greater shored depths may be achievable.

Pulling Force – Review

The minimum WLL of a single lifting point on any box panel 1 T (FOS of 3) or 11.27 T for 4 lifting points. This rated capacity is for any angle between vertical and 60° from vertical.

A minimum of 4 chains must always be used when lifting built up box system. Additional care must be used if using a single chain to pull on lifting points where a modular box system is held tightly in the ground.

Rated System Capacity

Users are advised to check that their excavations will not impose greater working earth pressures than recommended.

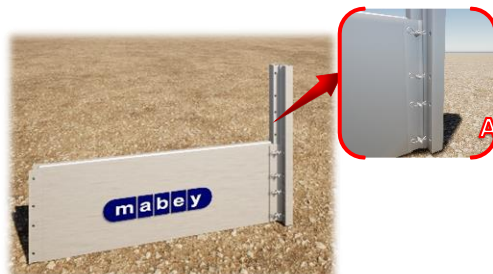
Deflection

As per AS4744.1 Section 5.3., the Maximum Span in the system is defined by **Span/60**. ie., the distance between struts.

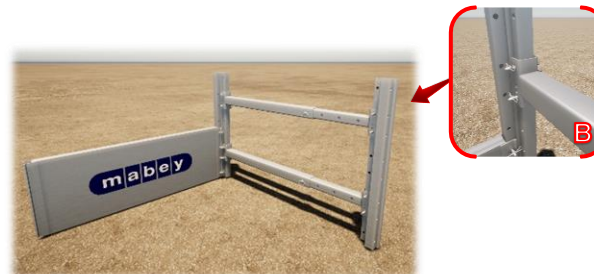
5. Typical Site Assembly - Lifting & Installation – 2-Sided Box



1. Remove panels and posts from the truck.



2. Corner post is attached to panel. Install pins with handles on the outside. Ensuring that all matching holes have a pin and keeper.



3. Set back spreaders at required spacing (refer to tabulated data) and 2nd corner post. Install pins and keepers in all matching holes.



4. Place the second panel on the opposite face of the box or 2nd corner. Install pins and keepers in all matching holes.



5. Install factory approved lift eyes, then install the remaining panels to desired height ensuring that all matching holes have a pin and keeper.



6. Add 3rd and 4th corner post ensuring that all matching holes have a pin and keeper. Install remaining lift eyes.



7. Install spreaders at required locations (refer to tabulated data). All matching holes require a pin and keeper.

Ensure the struts are horizontal and at right angles to the panels.



8. Pre-excavate to the required height and not more than one shoring section length. In principle, the pre-excavation complies with the type of soil and safety regulations.



Do **NOT** lift the shield with the chain sling attached to the struts.

9. Check to make sure all pins and clips are secure. Once the trench is dug to the required width and depth, lift the panels using the four-leg chain sling attached to the four lifting points at the top of corner post and place the box into the pre-dug trench.



Gap between Shoring and Soil face must **NOT** exceed 150mm

10. Lower the shoring box assembly into a pre-dug trench, providing that stability of this temporarily un-supported trench is assessed as stable throughout the duration of the work.

Do **NOT** use any unsupported part of the trench for access.



11. Once the shield is in place, remove the chains or slings. Backfill any gap between the pre-dug trench and the shoring box. Install end panels assemblies, if and where required.

It is Advisable the use of Safety Equipment.

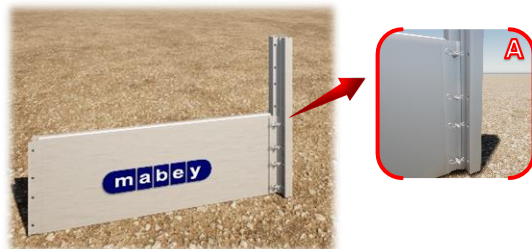


Note:
Bottom panel may be omitted, allowing 2 feet open, only if there is no possible loss of soil from behind or below the bottom of the shield.

5.2 Typical Site Assembly - Lifting & Installation – 3-Sided Box



1. Remove panels and posts from the truck.



2. Corner post is attached to panel. Install pins with handles on the outside. Ensuring that all matching holes have a pin and keeper.



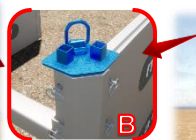
3. Set back panels for 3-sided system. Install pins and keepers in all matching holes.



4. Stack panels to desired height before adding second corner post. Install pins and keepers in all matching holes.



5. Install factory approved lift eyes, then install second and third corner post, ensuring that all matching holes have a pin and keeper.



6. Add opposite panels to desired height. Add fourth corner post. Ensuring that all holes have a pin and keeper. Install remaining left eyes.



7. Install spreaders at required locations (refer to tabulated data). All matching holes require a pin and keeper.



Ensure the struts are horizontal and at right angles to the panels.



8. Pre-excavate to the required height and not more than one shoring section length. In principle, the pre-excavation complies with the type of soil and safety regulations.



Do **NOT** lift the shield with the chain sling attached to the struts.

9. Check to make sure all pins and clips are secure. Once the trench is dug to the required width and depth, lift the panels using the four-leg chain sling attached to the four lifting points at the top of corner post and place the box into the pre-dug trench.



10. Lower the shoring box assembly into a pre-dug trench, providing that stability of this temporarily un-supported trench is assessed as stable throughout the duration of the work. Do **NOT** use any unsupported part of the trench for access.

Gap between Shoring and Soil face must **NOT** exceed 150mm



11. Once the shield is in place, remove the chains or slings. Backfill any gap between the pre-dug trench and the shoring box. Install end panels assemblies, if and where required.

It is Advisable the use of Safety Equipment.



Note: Bottom panel may be omitted, allowing 2 feet open, only if there is no possible loss of soil from behind or below the bottom of the shield.

PRODUCT USER GUIDE

MODULAR SHORING



5.3 Typical Site Assembly - Lifting & Installation – Square Box



1. Remove panels and posts from the truck.



2. Corner post is attached to panel. Install pins with handles on the outside. Ensuring that all matching holes have a pin and keeper.



3. Set back panels for 3-sided system. Install pins and keepers in all matching holes.



4. Stack panels to desired height before adding second corner post. Install pins and keepers in all matching holes.



5. Install factory approved lift eyes, then install second and third corner post, ensuring that all matching holes have a pin and keeper.



6. Add opposite panels to desired height. Add fourth corner post. Ensuring that all holes have a pin and keeper. Install remaining left eyes.



7. The fourth corner post can then be slid into place, a prybar may be needed to align post with holes. All matching holes require a pin and keeper.



8. Pre-excavate to the required height and not more than one shoring section length. In principle, the pre-excavation complies with the type of soil and safety regulations.



9. Check to make sure all pins and clips are secure. Once the trench is due to the required width and depth, lift the panels using the four-leg chain sling attached to the four lifting points at the top of corner post and place the box into the pre-dug trench.



Gap between Shoring and Soil face must **NOT** exceed 150mm

10. Lower the shoring box assembly into a pre-dug trench, providing that stability of this temporarily un-supported trench is assessed as stable throughout the duration of the work. **Do NOT** use any unsupported part of the trench for access.



11. Once the shield is in place, remove the chains or slings. Backfill any gap between the pre-dug trench and the shoring box. Install end panels assemblies, if and where required. It is Advisable the use of Safety Equipment.



Note: Bottom panel may be omitted, allowing 2 feet open, only if there is no possible loss of soil from behind or below the bottom of the shield.

6. Extraction of a Modular Shoring Box



Important:

Do not remove all pins and keepers at one time.

7. General

7.1 Basic Maintenance

- ▶ Regularly check that all pins are in place and 'R' clips fitted.
- ▶ Replace damaged components.
- ▶ Remove debris from Pins and 'R' clips.
- ▶ Avoid laterally loading the struts-either by hanging or propping from them or accidentally striking them with the site plant.

7.2 Do's and Don'ts

- ▶ DO use a ladder to enter the working space between the struts of the shield.
- ▶ DO wear a safety helmet to minimize the risk of head injury.
- ▶ DO ensure that the excavator operator is aware of your intentions.
- ▶ DO ensure that the unsupported part of the trench is safely battered.
- ▶ Do NOT climb up or down the struts.
- ▶ Do NOT use any unsupported part of the trench for access.
- ▶ Do NOT move the shield when personnel is inside it.

While information in this Guide is correct at time of printing, product specifications and product availability are subject to change without further notice. Please visit our website for the most up to date information. Job site photos are strictly intended for general product illustration only and may not comply with all applicable safety standards or site requirements. Specification data has been taken from manufacturers' serialised specific tabulated data.

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