

Product safe user guide Standard Aluminium Trench Shields



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Introduction

This booklet is intended to provide basic information for users of the LITE guard Aluminium Trench Shield and to draw the clients attention to the practical aspects of handling, assembly, installation and use which need to be considered in compiling method statements for a safe system of work. In particular, the clients attention is drawn to the size and weights of the Aluminium Trench Shield components and the need for planning the lifting operations involved.

The Aluminium Trench Shield is intended for use in trenches for which the excavation is being undertaken with small excavators which do not have the lifting capacity to work with standard, heavier, trench box systems. All major components of the Aluminium Trench Shield system have handling and lifting points for safe slinging.

It is assumed that clients are familiar with general safe practices applicable to trenching and excavation work. Users should ensure that the length and selected width of the box is sufficient for the work to be carried out. **The Aluminium Trench Shield is intended to act as a shield to provide a safe working area for operatives working in the trench. In all ground conditions, up to 50kN/m² with the addition of extra spreader bars. 4 spreader bars 20kN/m², 1 extra bar takes the WLL to 38kN/m² & 2 extra spreader bars takes it to 50kN/m², in all conditions, firm, dry stable, moist, wet conditions. See spreader bar chart on the Standard LITE guard panels.**

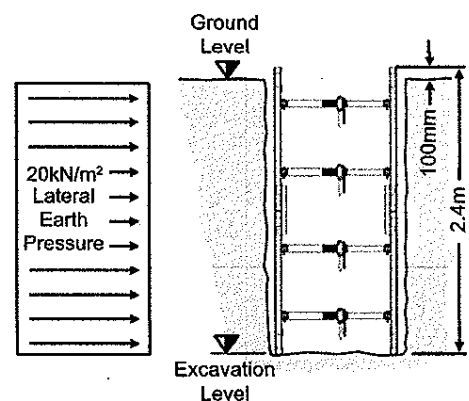
The Standard LITE guard trench shield was designed so it could be inverted for small shafts, by the provision of additional spreader bar locations. As shown on page 3. You can also attach a 1200 x 1200 panel to give you shaft depth to 3600mm.

If required to close off an open end of either Standard LITE guard configuration or the shaft set up, you can either install LITE guard panels with corner joiners or we have aluminium end panels that can be paced on the open ends as per drawings on page 3

1. Design

In the event of trench wall instability the Aluminium Trench Shield System is designed to carry a uniform lateral earth pressure of 20kN/m². Contact LITE guard if further assistance is required. Users are advised to check that their excavation arrangement will not impose greater working pressures than these. Conditions which will increase the likelihood of trench wall instability and lateral earth pressure include:

- Close proximity of structures.
- Excavated or construction materials adjacent to the trench.
- Close proximity of site roads.
- Close proximity of railways.



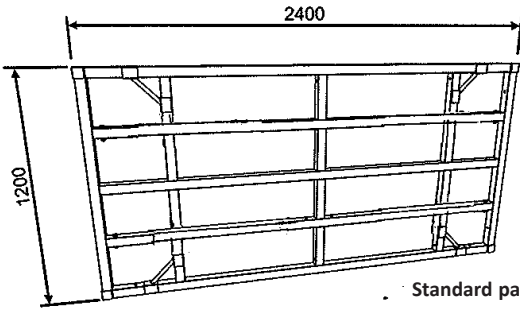
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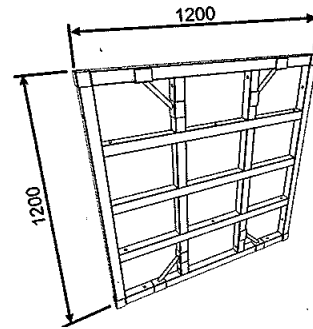
2. Trench

Users should note that settlement of the reinstated ground and ground next to the Aluminium Trench Shield is likely to occur after backfilling.

3. Component Identification and Dimensions



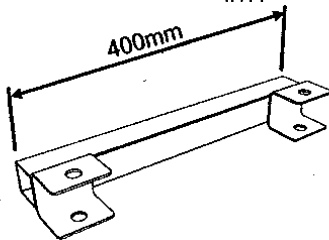
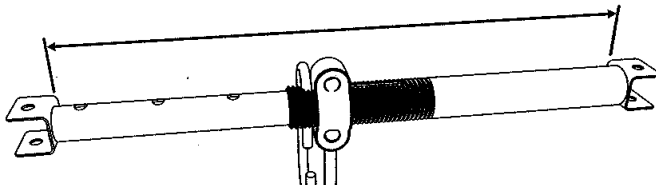
Standard panel 2400 x 1200 or 2400 x 600



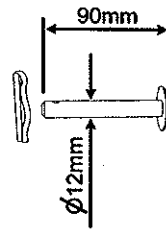
Short panel 1200x 1200

Adjustable Spreader Bars - Struts

Sizes: 600-900mm
1000 – 1800mm
Or other sizes on request

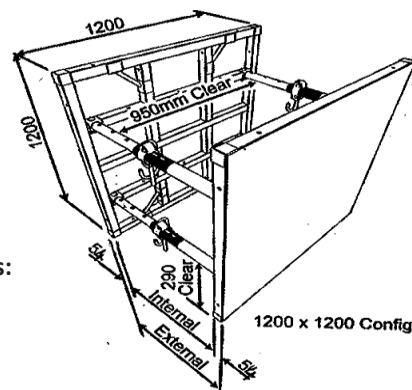
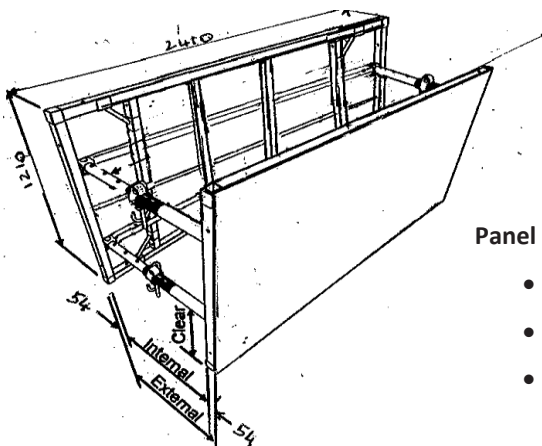


Extension Joiner - Connector



Pin and 'R' Clip

4. Dimensions and Weights of Aluminium Trench Shields



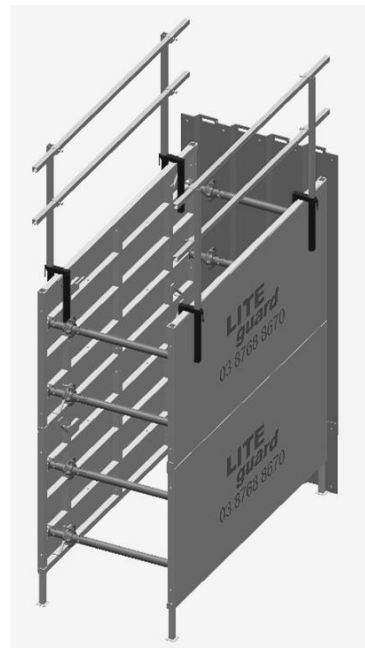
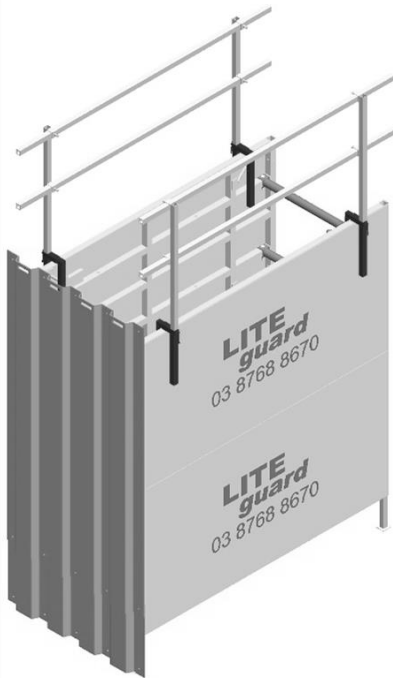
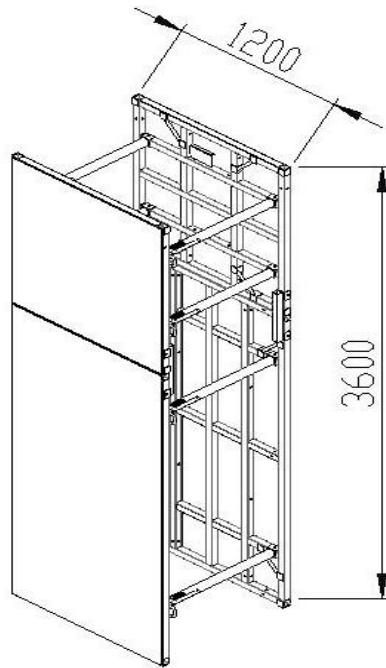
Panel Dimensions and Weights:

- 2400 x 600 30kg
- 2400 x 1200 55kg
- 1200 x 1200 30kg

Always allow for sufficient clearance for the excavator bucket to work comfortably within the internal width of the side panels when selecting a shield width.

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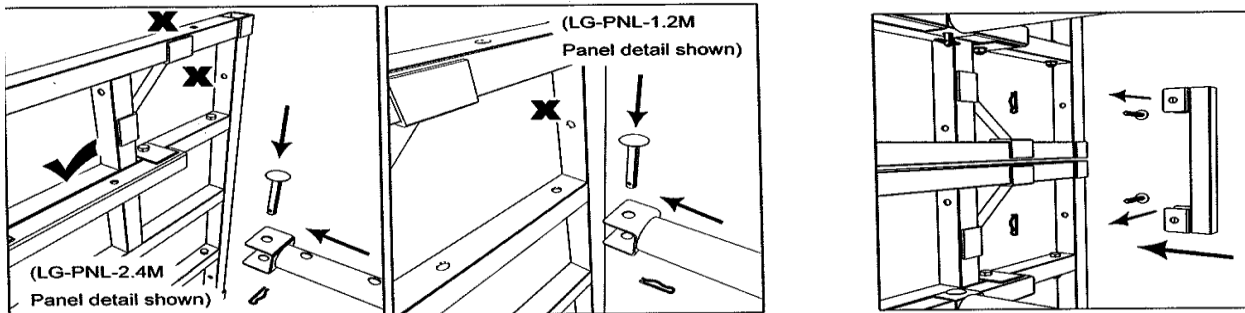
2.4 x 1.2M Shield Set stacked vertically with a 1.2 x 1.2M Shield set for shoring a small shaft



Using End Panels to shut of open end

5. Component Connection Details

All connections are via the 12mm diameter by 90mm long pin and secured with 'R' clip.



5.1 Strut Connection Detail

Struts are pinned to the panel via outer holes in horizontal section of frame (LG-PNL-1.2M). There are several spreader locations within the shield. The shield can be used vertically for small shafts

5.2 Extension connector (Joiner) is pinned via holes in the vertical section of frame at each end of the panel. (see section 10.2 for installation detail.

6. Off Loading and Site Handling of the Aluminium Trench Shield

7.1 Manpower The Health and Safety Legislation requires that personnel deployed are suitably trained, experienced and supervised by a competent person. The main activities associated with Aluminium Trench Shield installation are :-

- Unloading the delivery vehicle.
- Pinning the components together.
- Lifting the assembled shield into and out of the trench.

7.2 Plant for Lifting

A suitable appliance is required for off-loading and assembly. The machine lifting capacity and clearance under the lifting point should be checked against the sizes and weights of the box components and against the assembly / dismantling stages.

WARNING: If an excavator is being used for lifting operations Lifting Chains should be used.

7.3 Lifting Chains

Lifting Chains of suitable length and capacity complete with current certification. Typically for Aluminium Trench Shield a set of 4 leg 7mm chains with 4m leg length complete with safety hooks and shortening clutches.

7.4 Edge Protection, Access and Hard Standing Areas

These include:-

- 7.4.1 Suitable area to off-load the truck and assemble the Aluminium Trench Shield.
- 7.4.2 Suitable hard standing for the machine to operate to lift the shield into the trench.
- 7.4.3 Suitable access equipment (ladder or staging) for connection / removal of lifting chains.
- 7.4.4 Edge protection, ladders and possibly other provisions to provide safe access into and out of the trench.

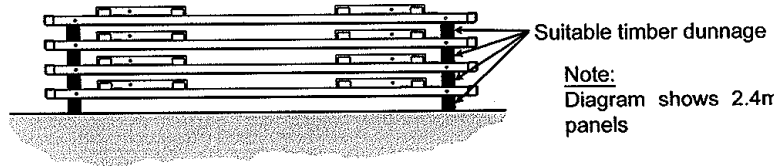
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8. Stacking, Handling and Transportation

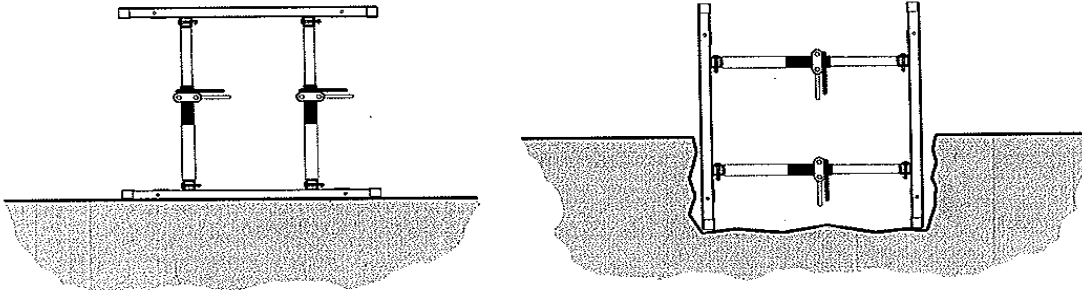
8.1 In Dismantled Form and in Transit

Aluminium Trench Shield panels and spreader bars should be stacked as shown with suitable timber dunnage. (Max 4 panels per stack). Adjustable Strut components and pins etc should be stored in skips / bins. During transportation stacks should be securely restrained to the vehicle bed.



Note:
Diagram shows 2.4m long panels

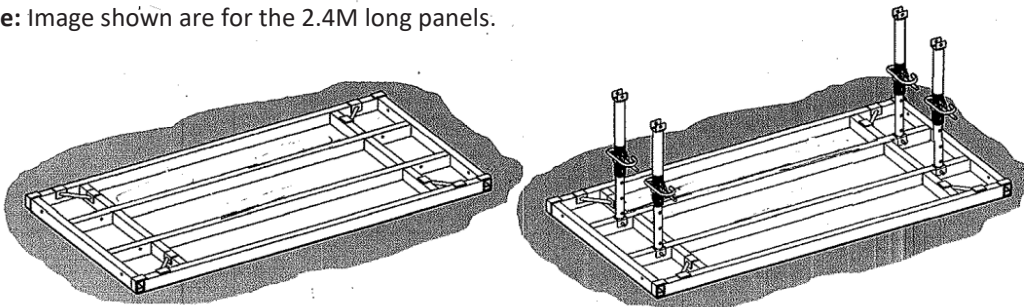
8.2 Site Storage If not in use, separate Aluminium Trench Shields from each other. Shields should be stored on their side or temporarily dug in when not in use (see below). Uneven or sloping ground and / or wind loading can result in inadequate stability if left upright.



Lie Aluminium Trench Shields on their side or temporarily dug in 0.5m

9. Site Assembly of Aluminium Trench Shields (dismantling is reverse procedure)

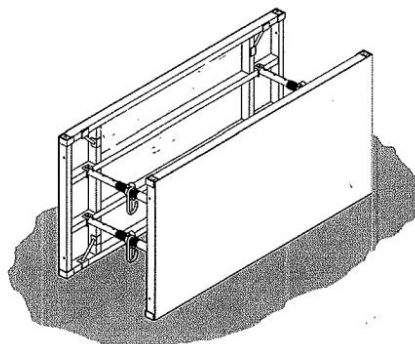
Note: Image shown are for the 2.4M long panels.



9.1 Lie the first panel flat on the ground rib side up.

9.2 Pin 4 Struts into the panel using the pins and 'R' clips

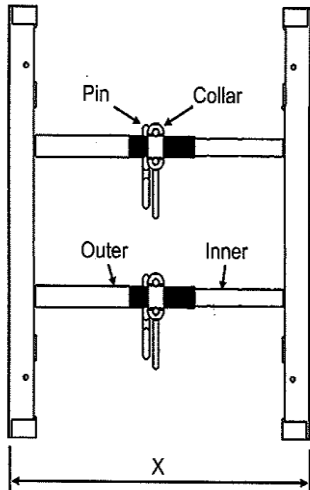
9.3 Lift the second panel onto the other and pin to the struts, once secured lift the unit up right using the chain sling



9.4 The shield assembly is now complete.

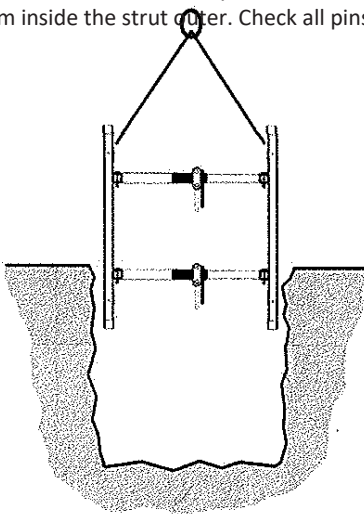
10. Installation of Aluminium Trench Shield

Note: Images shown are for the 2.4M long panels.

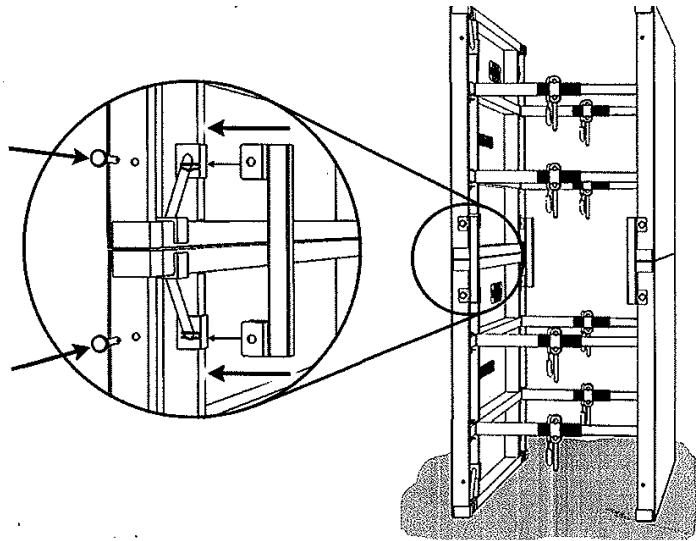


10.1 Set the struts to give the required shield Width (x). The strut length is changed by Relocating the pin for coarse adjustment and by Screwing the collar in and out for fine adjustment.

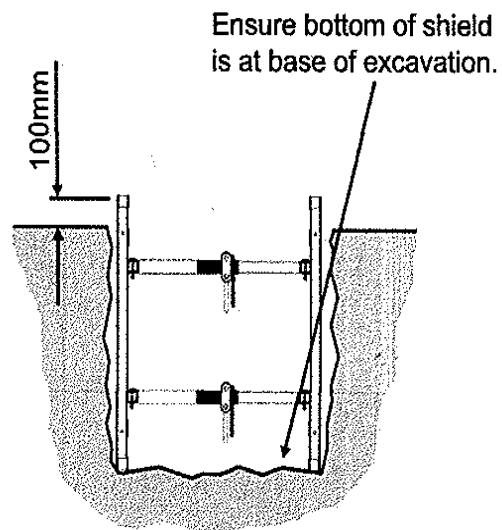
Ensure that the inner is always a minimum of 100mm inside the strut outer. Check all pins and 'R' clips are in place



10.3 Once the trench is dug to the required width and depth, lift the shield(s) using the four leg chain sling attached to the four lifting points at the top of the uppermost pair of panels.
DO NOT lift the shield with the chain sling attached to the struts.
Place the shield into the pre-dug trench.



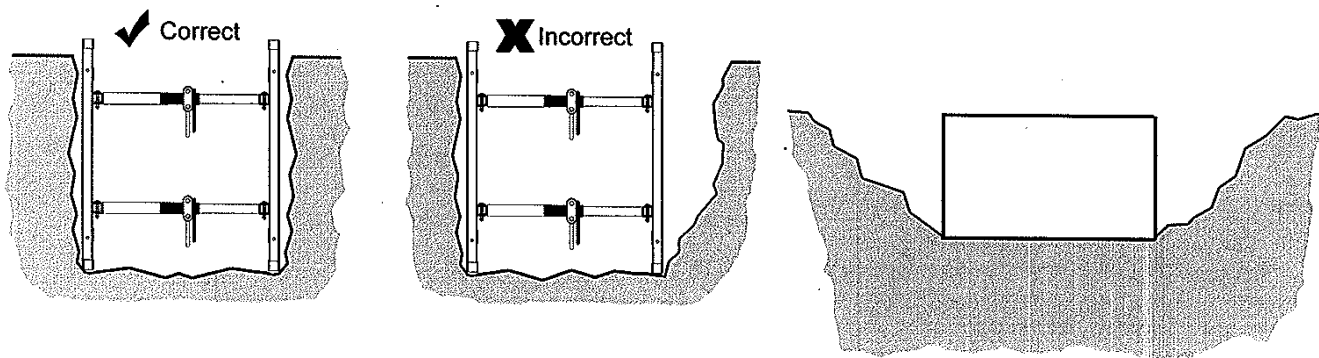
10.2 If the trench depth requires multiple shields they can be connected on top of each other (to a maximum of three shields). Assemble each shield as set out in section 9 and set the width as per section 10.1. Each additional shield is then lifted onto the previous shield and connected using 4 extension joiners complete with pins and 'R' clips.



10.4 Once the shield is in place remove the four leg chain sling. If the base of the shield is not on the bottom of the excavation, GENTLY push down with the machine on each panel to make sure the shield is safely in place, and will not suddenly slide down into the excavation. Ensure the struts are horizontal and at right angles to the panels before entering the trench. DO NOT use any unsupported part of the trench for access. Leave the top of the shield 100mm above the surrounding ground level

11. Before Entering the Trench

Note: Images shown are for the 2.4M long panels



11.1 Ensure there are NO large voids between the panels and the trench sides as this may allow the shield to sway sideways.

The trench should be dug slightly wider than the external shield dimension.

11.2 Always maintain a safe batter of the unsupported parts of the trench in front of and behind the shield.

12. Entering the Supported Excavation

- DO Use a ladder to enter the working space between the struts of the shield.
- DO wear a safety helmet to minimise the risk of head injury.
- DO ensure that the excavator operator is aware of your intentions.
- 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 are inside it.

13. Extraction of Aluminium Trench Shield

To extract the shield from the trench, attach the chain sling as for installation (using the four topmost lifting points on the shield) and lift the shield vertically out of the trench.

If the shield is tight in the trench, place the lifting chains on the two lifting lugs at one end of the shield. Lift this end of the shield slightly and then reposition the chains to the other end of the shield and lift slightly. Continue to swap the chains from one end of the shield to the other, lifting slightly each time until the shield is loose in the trench and can then be removed in the normal fashion using all four legs of the sling on the top four lifting points.

Alternatively wind in the screw jacks on the struts to loosen the shield in the trench before removing using the top four lifting points.

14. Precautions During Use and Maintenance

- Regularly check that all pins are in place and 'R' clips fitted.
- Avoid laterally loading the struts - either by hanging or propping from them or accidentally striking them with site plant. Damaged struts should not be used.

15. General

Since our policy is one of continual improvement, components may vary in detail from descriptions given in this publication.