

Product safe user guide Super/Super Size/ Super Size Plus & City Box Aluminium Trench Shields



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1. Introduction

This booklet is intended to provide basic information for users of the LITE guard Aluminium Trench Box System and to draw the client's attention to the practical aspects of Trench Box assembly and installation which need to be considered in compiling method statements. In particular, the client's attention is drawn to the size and weights of the Trench Box components and the need for planning the lifting operations involved. All panels of the Trench Box System have lifting points for safe slinging when the box is assembled and standing on its cutting edges. Lifting operations during box assembly require slinging techniques as detailed in sections 9 and 10.

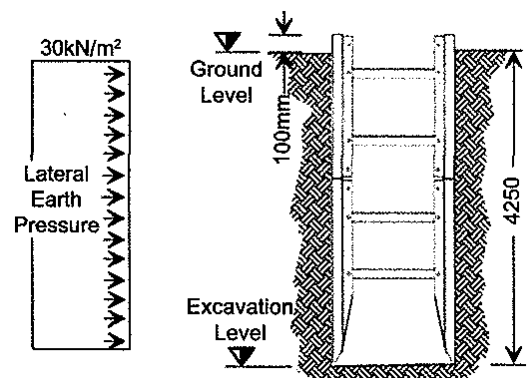
It is assumed that clients are familiar with general safe practices applicable to this type of work. The Aluminium Trench Box is a trench support system for support of trenches and is not intended for other purposes. Excavation pressure should not exceed the safe working capacity of the shoring box all kN/m² ratings are listed on compliance plates.

Trench boxes should NOT be used in seawater applications without prior consultation with LITE guard.

2. Design

The Aluminium Trench Box system is for normal trenching operations. Methods of estimating lateral earth pressure vary. Typical working pressures that the Trench Box can sustain are as shown on the compliance plate on each panel, and should satisfy most situations. 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 are likely to increase the 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.



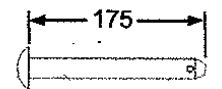
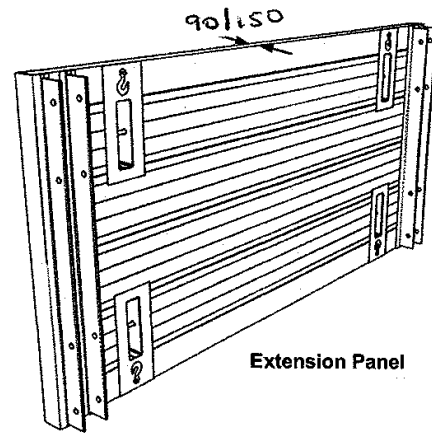
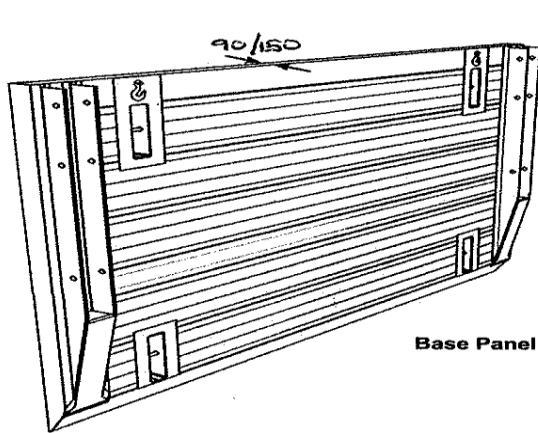
3. Trench Reinstatement

Users should note that some settlement of the reinstated ground and ground adjacent to the trench is likely to occur after backfilling.

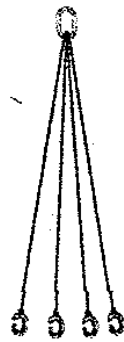
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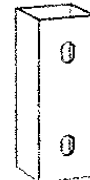
4. Component Identification and Dimensions



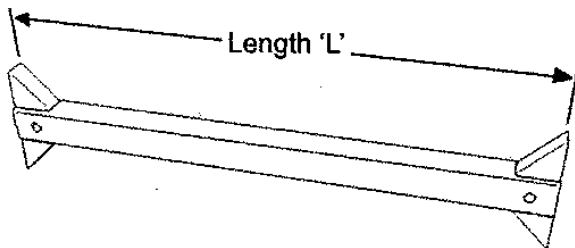
Pin for Fixed Strut



Chain Sling



Connector



Struts come in various sizes

800mm, 1000mm, 1200mm, 1500mm, 1800mm, 2000mm.

5. Dimensions and Weights of Aluminium Trench Boxes

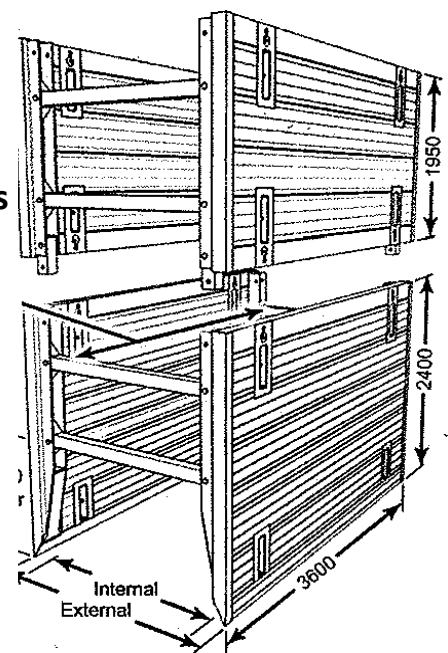
Shields come in various sizes from 3100mm – 7200mm long

There are 2 panel thicknesses as well.

Super LITE guard 90mm thick

Super Deep LITE guard are 150mm thick

See compliance plate on each shield for weights



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6. Connection Details

The Fixed Strut is connected to Panel using 20 dia Pin x 175 long and secured with 'R' Clip. (see section 9 for Base Box assembly details)

The Extension Box is connected to the Base Box using 4 Extension Joiners/Connectors, 1 No. at each corner. Each connector is pinned to Extension Panel and adjacent Base panel using 2 20 dia Pin x 175mm long and secured with 'R' Clips. (see section 10 for Extension Box assembly details)

7. Off Loading and Site Handling of Aluminium Trench Boxes

7.1 Manpower The Health and Safety Regulations require that personnel deployed are suitably trained, experienced and supervised by a competent person.

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.

7.3 Lifting Chains , Lifting Chains of suitable length and capacity complete with current certification. Typically for Aluminium Trench Boxes a set of 4 leg 13mm 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 lorry and assemble the Trench box.

7.4.2 Suitable hard standing for the machine to operate to lift the box into the trench.

7.4.3 Suitable access equipment (ladder or staging) for connection / removal of lifting chains (wider boxes only).

7.4.4 Edge Protection, ladders and possibly other provisions to provide safe access into and out of the trench.

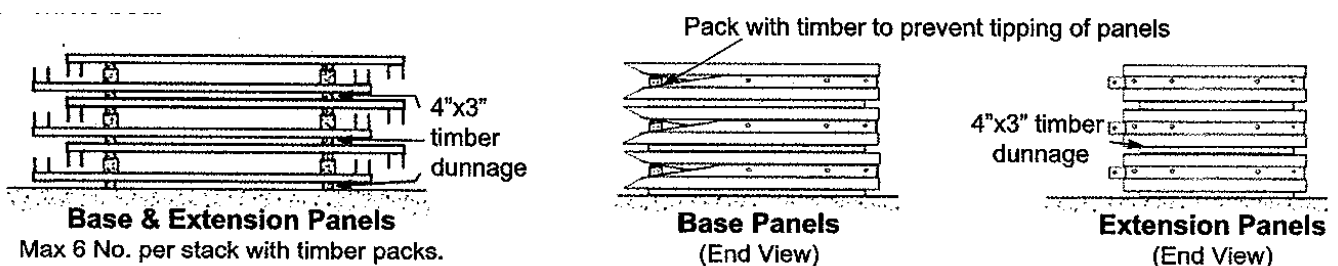
(Edge protection and ladder access platforms can be supplied by LITE guard).

7.5 Return of Equipment Off-Hire

Clients should ensure that on removal, the equipment is returned in sections as supplied.

8. Stacking, Handling and Transportation

8.1 In Dismantled Form and in Transit Base and extension panels should be stacked nested as shown with suitable timber dunnage. (Max 6 panels per stack). Strut components and pins etc should be stored in skips/bins. During transportation stacks should be securely restrained to the vehicle bed.

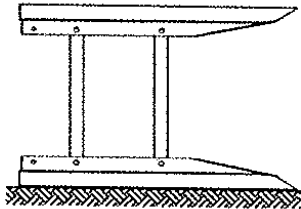


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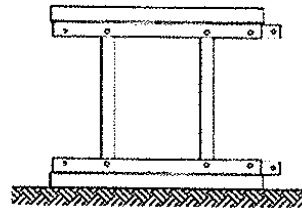


8.2 Site Storage

Important: When assembled boxes are not in use, base boxes should always be separated from extension boxes. Due to the light weight of base and extension boxes, they should always be stored laid on their side when not in use to protect them from being blown over.



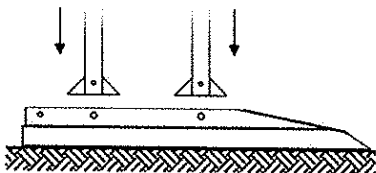
Lie base boxes on their side when not in use.



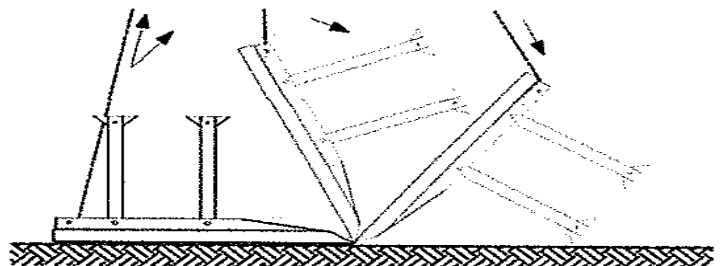
Lie extension boxes on their side when not in use.

9. Typical Site Assembly of Base Box (Dismantling is reverse procedure)

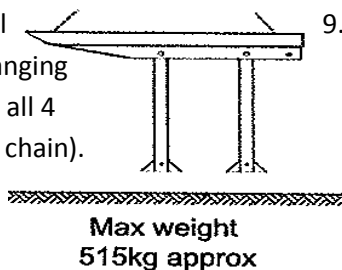
9.1 Lie both base panels flat on ground with strut connector points facing upwards. Pin 4 No. Fixed Struts into position using 20mm dia pins (LG-PIN-LRG) and 'R' Clips. Each strut should be lifted in turn using a choke hitch around one of the strut ends.



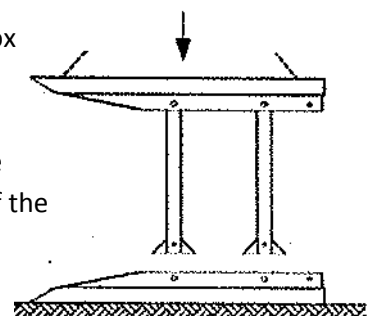
9.2 Carefully turn this base panel over using 2 legs of the four leg sling



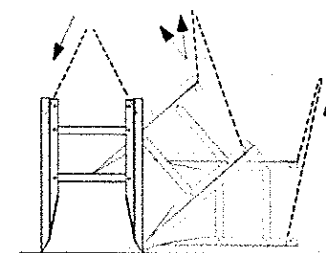
9.3 Re-sling this panel with the struts hanging downwards. (Use all 4 legs of the lifting chain).



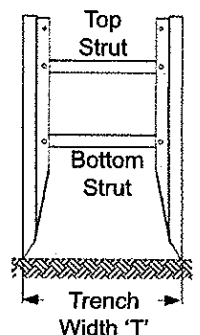
9.4 Complete assembly of the base box on its side by pinning the struts to the lower panel using LG-PIN-LRG Pins & 'R' clips. Do not release the weight of the top panel until all of the pins and clips are in place.



9.5 Attach 2 chains of sling to UPPER lifting points on UPPER MOST panel and 2 chains to UPPER lifting points on LOWER panel as shown. Stand box on its cutting edges with great care to avoid damaging the struts. It is important that the weights and radius are well within the lifting capacity of the machine to allow for impact and lurching effects as the box is turned upright. The completed base box can now be lifted on 4 chain legs. See Section 8 for guidance on safe storage



Max weight 919 kg approx

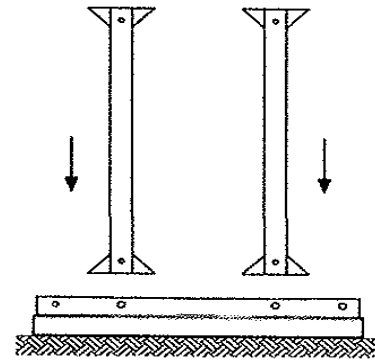


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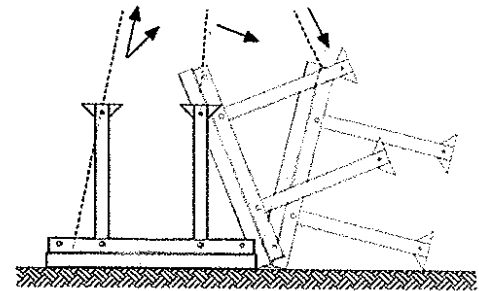


10. Site Assembly of Extension Box (Dismantling is reverse procedure)

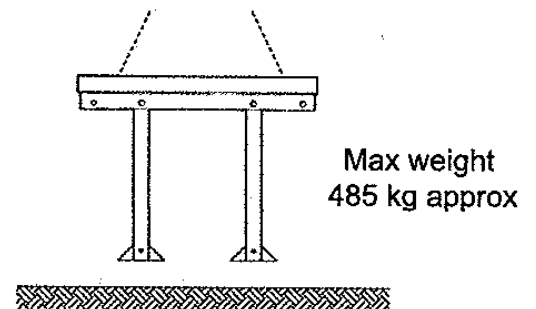
10.1 Lie both extension panels flat on the ground with flanges pointing upwards. Pin 4 No. Fixed Struts into position using 20mm dia pins and 'R' clips. Each strut should be lifted in turn using a choke hitch around one of the strut ends.



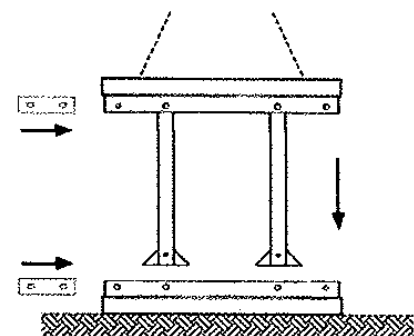
10.2 Carefully turn this extension panel over using 2 legs of the four leg sling.



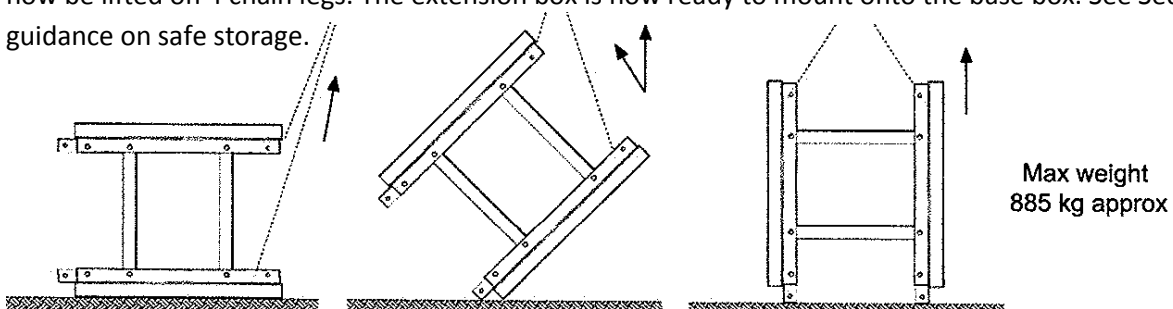
10.3 Using all 4 legs of the lifting chain, re-sling this panel with the struts hanging downwards.



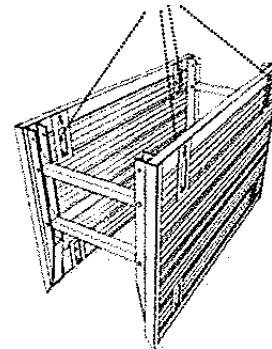
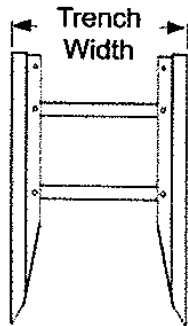
10.4 Complete assembly of the extension box on its side by pinning the struts to the lower panel using LRG pins and 'R' clips. Do not release the weight of the extension panel until all of the pins and clips are in place. Pin 4 No. extension joiners/connectors to the base of the finished extension box assembly (1 per corner) using LRG pins.



10.5 Attach 2 chains of sling to UPPER lifting points on UPPERMOST panel and 2 chains to UPPER lifting points on LOWER panel as shown below. Stand the box upright taking great care to avoid damaging the struts an extension connectors. It is important that the weights and the radius are well within the lifting capacity of the machine to allow for impact and lurching effects as the box is turned upright. The completed extension box can now be lifted on 4 chain legs. The extension box is now ready to mount onto the base box. See Section 8.2 for guidance on safe storage.

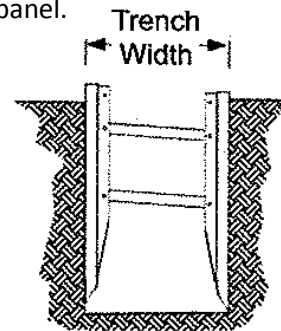
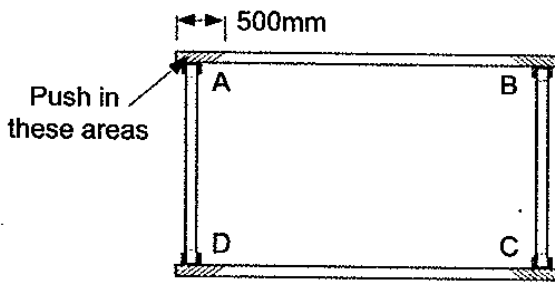


11. Installation of Base Boxes



11.1 After following the assembly Procedure Check All pins and safety clips are in place

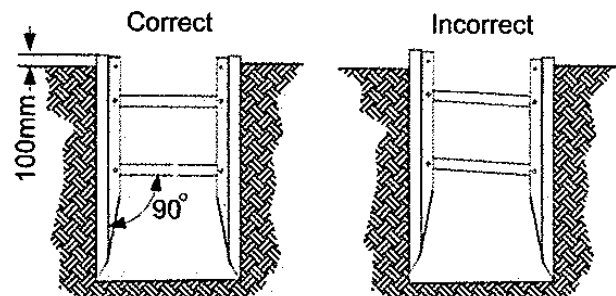
11.2 Lift the box using the 4 leg chain sling attached to the lifting points at the top of each panel.



11.3 Dig the trench to correct width and as close to full depth as reasonably practicable. Using the 4 leg chain sling place the box in the trench. If full depth is not achieved prior to placement, the trench box can be installed to correct depth by digging between the box panels, and CAREFULLY pushing down on the ends of the panels. When pushing the box panels down, always push down on each panel in sequence and never diagonally across corners i.e. push A & B followed by C & D and never A & C or B & D. Always dig below the panels before pushing down. Push only on the end 500mm of each panel and never in the middle.

11.4 Rotation about the pinned strut ends is limited. Great care must be taken not to push too far on the panel corners during the 'dig and push' operation (11.3) so as not to cause damage to the struts or panels.

11.5 When the box is installed to full depth, ensure that 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 box 300mm min. above the surrounding ground level. 1



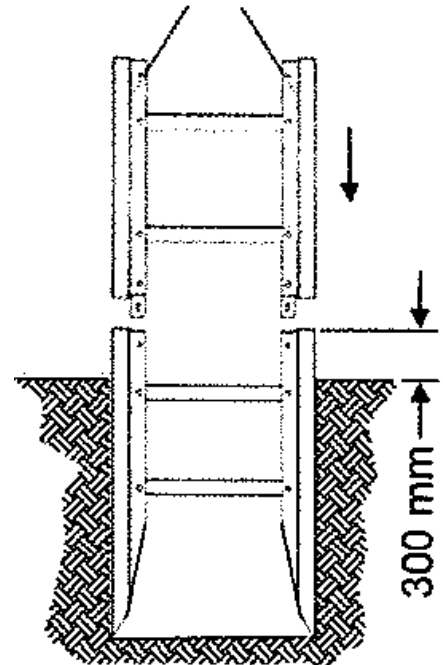
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12. Installation of Extension Boxes

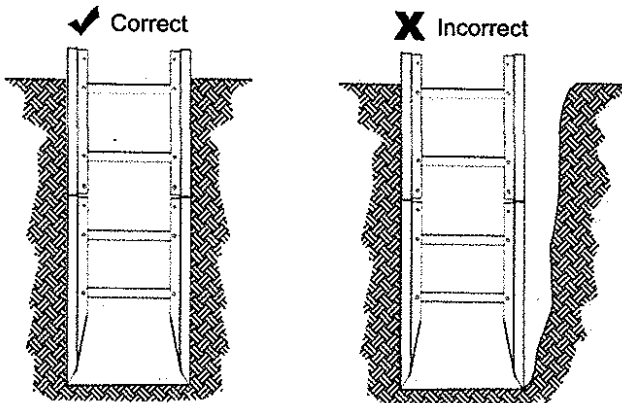
- 12.1 Install Base box as per section 11 leaving the top of the box 300mm above surrounding ground level.
- 12.2 Use 4 leg chain to sling the extension box (complete with extension connectors) into position over the base box.
- 12.3 Fit one side of the extension box to the base box first to ensure correct alignment. Ensure the extension connectors on the extension panel enter the slots in the base panel end post. Pin with PIN-LRG (1 per corner).
- 12.4 Repeat for second extension panel to complete base box and extension box assembly.
- 12.5 Carefully continue the 'dig and push' process (11.3) until full depth has been reached. Leave the top of the box 100mm min. above the top of the surrounding ground level. **12.5 BE AWARE of ground conditions before** stacking more than 2 extension boxes on base box unit.

sheets. LITE guard can also supply End Panels to close off the end of the trench.



13. Before Entering the Trench

13.1 General

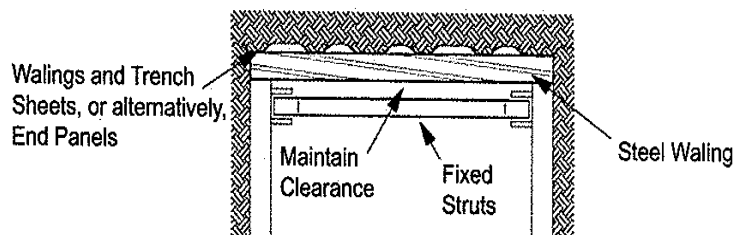
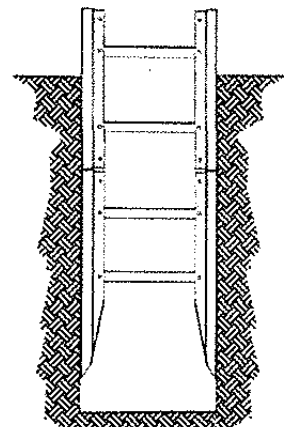


Ensure that there are no voids between the box panel and the trench sides as this may cause the box to move sideways. **AS GOOD PRACTICE** it is recommended for the trench to be no more than 150mm wider than the shield. If wider then place some spoil in the area between shield and trench wall

13.2 End closures

When stopping off the end of the trench, steel walers should be used to support the sheets off the end of the panels. Never use the struts as supports for the trench

DO NOT leave the base of the box "flying above the excavations level.



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13.3 Entering the Supported Excavation

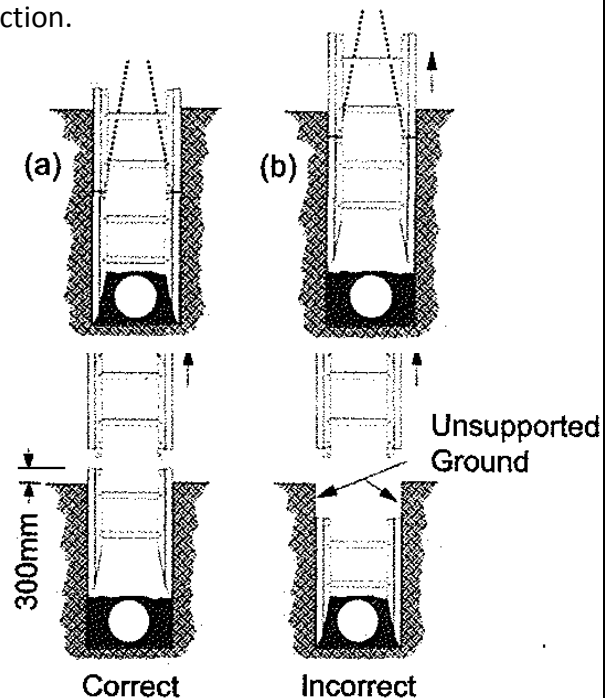
- 13.3.1 Use a ladder to enter the working space between the struts of the trench box. DO NOT climb up or down the struts.
- 13.3.2. **DO NOT** use any unsupported part of the trench for access.
- 13.3.3. DO NOT move the box when personnel are inside it.
- 13.3.4. Wear a safety helmet to minimise the risk of injury.
- 13.3.5. Ensure that the excavator operator is aware of your intentions.

14. Extraction of Aluminium Trench Boxes

NOTE: No person should be in the trench during extraction.

14.1 After initial backfilling (a) and compaction, lift the base box complete with extension box (if fitted) from the trench using the 4 leg chain attached to the upper lifting points on the two base panels (b). Continue back-filling as removal of the box proceeds.

14.2 Alternatively if the extension box is to be removed from the base box, lift as per 14.1, until the base box is approx. 300mm above ground level. Remove 4 corner connecting pins, re-sling and lift the extension box off the base. Continue backfilling as removal of the base box proceeds. DO NOT remove the extension box before the top of the base box is above ground level.



15. Precautions During Use and Maintenance

- 15.1 Regularly check that all pins and 'R' clips are fitted correctly.
- 15.2. Avoid laterally loading the fixed struts – either by hanging or propping from them or by accidentally striking them. Damaged struts should not be used.

16. References

Trenching Code of Practice 1988

17. General

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