System 20 Trench Lining Safety and Operating Procedures

Preamble
System 20 Trench Lining is designed for ground pressures up to 20 kN/m2. If in doubt about the generated ground pressure in the excavation consult a qualified soil engineer.

Unloading (Method to be determined by Risk Assessment on Site)

Disassembled
1)By forklift/telehandler

Ensure the forklift/telehandler has sufficient capacity and adequate fork length to lift the equipment safely. (See capacity table).

Ensure that each lift occurs at the centre of gravity. Lift only one item at a time.

2)By crane/excavator

Ensure the crane/excavator has sufficient capacity and adequate chains to lift the equipment safely. (See capacity table). Use good slinging practice at all times.

Ensure the chain(s) are connected to the four lifting points on the panel (two beneath the driving caps on each side of the panel and two on the bottom of the panel). Lift only one item at a time.

How to assemble a Trench Box

Assemble struts by inserting strut inners into spacers. Set to the required length by inserting pins through the spacer and strut. Ensure pins are secured by "R" clips. Check length of each strut. Position first panel so that pockets are uppermost and level. Insert struts into pockets and pin through securing with "R" clips. Position second panel so that the pockets are lowermost and it is in a level plane. (By forklift/Telehandler or suspended on chains by the lifting points). Lower the second panel onto upraised struts. When the struts are located pin through and secure with "R" clips. The trench box is now assembled. To stand the trench box upright attach chain(s) to the four top lifting points under the driving caps and lift trench box upright.

Storage/Stacking (To be determined by Risk Assessment on Site)

Trench boxes articulate to allow easy installation, this may cause them to fall over when stored or stacked. Therefore never stack one trench box on top of another. When storing trench boxes ensure they are stable either by "lying down" boxes that are less than 1500mm wide, or supported between one metre cube concrete blocks or installed in shallow trenches. Depending on site conditions trench boxes wider than 1500mm may be more safely stored in an upright position with or without support or installation. In all cases risk assessment should be undertaken to ensure site safety.

How to install a trench box.
The method of installation should be determined by Risk Assessment.

Pick and Place

This method of installation does not support the side walls of the excavation, therefore the trench box is used as a safety shield. It maybe inappropriate to use in certain ground conditions where there is risk of movement, where reinstatement is critical or if the excavation is subject to surcharge.

Excavate the trench to the required width and depth. Do not over dig.

Lift the trench box into position. Ensure enough of the trench box remains above the trench to prevent any ground falling into the excavation. If this requires a top box fit it to the base box prior to installation, ensure base box is adequately supported or bench the excavation to allow the top box to be attached in safety then dig out the benching and push box down into position.

Batter back the unsupported ends of the trench or install trench sheeting and walers to support the ends. DO NOT SIDE LOAD THE TRENCH BOX STRUTS IT MAY CAUSE FAILURE.

Do not enter excavation until installation is complete and declared safe.

Dig and Push

This method of installation supports the side walls of the excavation and should be the preferred method of installation.

Dig a starter hole approximately 1.0 metre deep and long enough to accept the trench box.

Lift the trench box into the starter hole. Ensure the panels remain vertical.

Push the back of the excavator onto the driving caps of each panel to push the panel into the ground. Push each panel in turn until it reaches the limit of its movement.

Then excavate beneath the panel and push down again. Repeat the process until the required depth is achieved. Ensure enough of the trench box remains above the trench to prevent any ground falling into the trench. (See "How to add a top box")

Only push on the driving caps, pushing elsewhere on the panel may cause severe damage to the panel and the bucket.

Batter back the unsupported ends of the trench to the angle of repose or install trench sheeting and walers to support the ends. NEVER SIDE LOAD THE TRENCH BOX STRUTS IT MAY CAUSE FAILURE.

Do not enter the excavation until installation is complete and declared safe.

Compaction

Over time the walls of the excavation may close in on the trench box, it is therefore recommended to ease the trench box by slightly lifting it prior to compaction to prevent compaction causing the trench box becoming stuck.

Never compact more than one third up the face of the trench box then raise it before continuing.

Always be aware that compaction may damage the inner faces of the trench box.

Extraction

The method of extraction should be determined by Risk Assessment.

Due to consolidation it may be more difficult to extract the trench box than installing it. Use only the extraction/lifting points located on the underside of the driving cap. Ensure that the chain sling is strong enough to undertake this operation. Be aware that chains may snap if improperly used and cause severe injury, therefore never allow personnel in the vicinity of the lift.

Methods of extraction (listed in increasing difficulty of extraction)

1) Straight pull

Attach the chain sling to the two extraction/lifting points on each panel and lift the trench box using four legs of the chain sling.

2)Half pull

Attach the chain sling to the two extraction /lifting points on one panel only and lift that panel. When it has reached it maximum movement remove the chain sling and connect it to the other panel and lift. Repeat the procedure until the trench box is extracted.

3)Single pull

Attach a single leg of chain sling to an extraction/lifting point and raise the corner of each panel in turn, when the trench box moves freely remove the trench box by method 1.0).

How to add a top box

The method of adding a top box should be determined by Risk Assessment.

1) If adding a top box whilst the base is outside the excavation, ensure the trench box is adequately supported (see "How to install a trench box").

2)Lift the top box so that the panel connectors hang down.

3)Locate the panel connectors in the pockets at the top of the panel.

4)Pin through the panel connectors and the panel pocket. Ensure the pins are secured with "R" clips, the box is now ready for use.

5)If adding a top box whilst the base is in the excavation, ensure enough of the base is above the trench to enable the insertion of securing pins without the need to enter the trench unless the end walls are battered back or supported. Undertake 2) to 4) above.

Other Hazards

1.0) Never use bent or damaged struts or panels
2.0) Never attempt remove/adjust struts whilst the trench box is in the excavation.
3.0) Never attempt to lift the trench box using the struts.
4.0) Never climb in or out of the trench using the struts. Always use a ladder.
5.0) Never move a trench box with personnel inside.
6.0) Never enter an unsupported part of the trench.
7.0) Never apply side loads to struts
8.0) Never exceed the load capacity of the trench box.

Always practise good site safety practice