

5.1m Drag Box Safety and Operating Procedures – Telescopic Struts

Preamble

The 5.1m Drag Box is designed for ground pressures as per the Capacity Table. 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)

Assembled

1) By forklift/telehandler

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

Ensure all pins in the drag box are fully connected and secured by “R” clips before lifting.

Ensure that each lift occurs at the centre of gravity. Lift only one item at a time. When lifting the drag box position the forks in the centre underside of the upper panel. Never lift from the lower panel.

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 all pins in the drag box are fully connected and secured by “R” clips before lifting.

Ensure the chain(s) are connected to the four lifting points on the upper panel of the drag box (two on each side of the panel) Lift only one box at a time.

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 Drag Box with Telescopic Struts

Position the first panel so that pockets are uppermost and level. Set the struts to the minimum width. Insert the struts into the pockets and pin through securing with “R” clips ensuring the heads of the pins are pointing into the drag box working area. Position the second panel so that the pockets are lowermost and it is in a level plane. (By using a forklift/Telehandler or suspended on chains by the lifting points). Lower the second panel onto upraised struts. To safely access to the pin position on the upper panel it may be necessary to use staging or scaffolding. When the struts are located; pin through and secure with “R” clips. The drag box is now assembled. With the upper panel still supported by a forklift/Telehandler or suspended on chains by the lifting points remove the strut pin and raise the upper panel until the correct strut length is achieved then insert the pins as previous. To stand the drag box upright attach chain(s) to the four top lifting points under lift and lift drag box upright.

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

Ensure the storage area is flat and firm. When storing drag 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 drag 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. Do not store drag boxes by stacking them on top of each other.

How to install a drag box.

The method of installation should be determined by Risk Assessment.

Installation

Drag boxes do not support the side walls of the excavation, therefore the drag box acts as a safety shield it is therefore critical that there is a gap between the side of the drag box and the side walls of the excavation. Using a drag box maybe inappropriate 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 using a bucket that will fit inside the drag box. Ensure the trench is long enough to accept the drag box. Batter the front and rear of the excavation to the angle of repose for the soil type (to

prevent the end walls of the excavation collapsing into the working area). Alternatively install trench sheeting and walers at each end of the excavation.

Lift the drag box into trench. Ensure that 150mm of the drag box remains above the trench to prevent any ground falling into the excavation. If this requires a top box; it may be fitted as detailed in **How to add a top box**.

Batter back the unsupported ends of the trench or install trench sheeting and walers to support.

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

The first pipe may now be laid.

When the first pipe has been laid the trench should be evacuated.

The excavator digs in front of the drag box. Ensure the trench is wide enough to accept the drag box and that the walls of the trench are free of obstructions to the drag box., also ensure that sufficient material is removed between the wall and the floor of the trench otherwise the drag box will "ride" up. When a sufficient area has been excavated the excavator pulls the drag box into this space by "crowding" the bucket around the pulling beams in the base box and smoothly pulling the drag box into position. Again ensure the end of the excavation is either battered back or supported by walers and trench sheets.

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

The second pipe may now be laid. Repeat for subsequent pipes.

Compaction

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

Never compact more than one third up the face of the drag 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 drag box than installing it. Use only the extraction/lifting points located on the top of the panel. 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 drag box using four legs of the chain sling.

2) 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 drag box moves freely remove by method 1).

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 drag box is adequately supported by using concrete blocks or digging a shallow trench.

2) Fit the panel connectors to the bottom connector points on the top box.

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

4) Locate the panel connectors in the pockets at the top of the lower panel.

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

6) 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 drag box is in the excavation.
- 3.0) Never attempt to lift the drag 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 drag 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 drag box.
- 9.0) Be aware of overhead power lines.

Always practise good site safety practice

Capacity Chart – Drag Box

5.1m x 2.5m Lower Panel DB-B-SV-F-XX-5,10 x 2,50 x 0,10-1,20/5,10-1,50/1,50-25/25-3.64/5.03	Approx 1485 kg each	25kN/m2
5.1m x 1.5m Upper Panel DB-T-SI-F-XX-5,10 x 1,50 x 0,10-1,20/5,10-XX/XX-25/25-2,29/2,98	Approx 976 kg each	25kN/m2
5.1m x 3.2 m Lower Panel DB-B-SI-F-XX-5,10 x 3,20 x 0,10-1,20/5,10-1,50/1,50-25/25-4,47/5,87	Approx 1805 kg each	25kN/m2
3.2m x 2.5m Rear Extension	Approx 1075 kg	25kN/m2
5.1m x 1.8m Lower Panel DB-B-SI-F-XX-5,10 x 1,80 x 0,10-1,20/5,10-0,88/0,88-25/25-2,15/4,21	Approx 1075 kg each	25kN/m2

Fixed Struts

800mm Strut	Approx	58 kg each
1000mm Strut	Approx	72 kg each
1200mm Strut	Approx	87 kg each
1400mm Strut	Approx	101 kg each
1600mm Strut	Approx	116 kg each
1800mm Strut	Approx	130 kg each
2000mm Strut	Approx	144 kg each

5.1m Drag Box Lower x 800 internal	Approx	3202 kg each
5.1m Drag Box Lower x 1000 internal	Approx	3258 kg each
5.1m Drag Box Lower x 1200 internal	Approx	3318 kg each
5.1m Drag Box Lower x 1400 internal	Approx	3374 kg each
5.1m Drag Box Lower x 1600 internal	Approx	3434 kg each
5.1m Drag Box Lower x 1800 internal	Approx	3290 kg each
5.1m Drag Box Lower x 2000 internal	Approx	3546 kg each

5.1m Drag Box Upper x 800 internal	Approx	2068 kg each
5.1m Drag Box Upper x 1000 internal	Approx	2096 kg each
5.1m Drag Box Upper x 1200 internal	Approx	2126 kg each
5.1m Drag Box Upper x 1400 internal	Approx	2154 kg each
5.1m Drag Box Upper x 1800 internal	Approx	2212 kg each
5.1m Drag Box Upper x 2000 internal	Approx	2240 kg each

Telescopic Strut

	Outer Approx	Inner Approx	Total Approx
Type A 1200 – 1500 internal (150mm pitch)	91 kg each	77 kg each	168 kg each
Type B 1500 – 2100 internal (150mm pitch)	133 kg each	99 kg each	232 kg each
Type C 2100 – 3000 internal (150mm pitch)	201 kg each	125 kg each	326 kg each
Type D 3000 – 5100 internal (150mm pitch)	306 kg each	210 kg each	516 kg each

5.1m x 2.5m Drag Box Lower (1200 – 1500 int)	Approx	3642 kg each
5.1m x 2.5m Drag Box Lower (1500 – 2100 int)	Approx	3898 kg each
5.1m x 2.5m Drag Box Lower (2100 - 3300 int)	Approx	4274 kg each

5.1m x 2.5m Drag Box Lower (3000 – 5100 int)	Approx	5034 kg each
5.1m x 1.5m Drag Box Upper (1200 – 1500 int)	Approx	2288 kg each
5.1m x 1.5m Drag Box Upper (1500 – 2100 int)	Approx	2416 kg each
5.1m x 1.5m Drag Box Upper (2100 – 3300 int)	Approx	2604 kg each
5.1m x 1.5m Drag Box Upper (3000 – 5100 int)	Approx	2984 kg each
5.1m x 3.2m Drag Box Lower (1200 – 1500 int)	Approx	4282 kg each
5.1m x 3.2m Drag Box Lower (1500 – 2100 int)	Approx	4728 kg each
5.1m x 3.2m Drag Box Lower (2100 - 3300 int)	Approx	4914 kg each
5.1m x 3.2m Drag Box Lower (3000 – 5100 int)	Approx	5685 kg each
5.1m x 1.8m Drag Box Lower (1200 – 1500 int)	Approx	2150 kg each
5.1m x 1.8m Drag Box Lower (1500 – 2100 int)	Approx	3078 kg each
5.1m x 1.8m Drag Box Lower (2100 - 3300 int)	Approx	3454 kg each
5.1m x 1.8m Drag Box Lower (3000 – 5100 int)	Approx	4214 kg each