PRO MECH GROUND SUPPORT SYSTEMS

Mini/Midi/ Maxi Drag Box Safety and Operating Procedures

Preamble

The Mini/Midi/Maxi Drag Boxes are 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

Left Hand Panel (Drawing 1).Position the first panel so that pockets are uppermost and level. Bolt the front strut mounting to the left hand flange at the lowest position (4no holes should be visible above the front strut mounting) using 8no M16 x 60 Bolts c/w Nuts (8.8 Grade). Leave the nuts and bolts loose to aid assembly. Insert the front strut and pin to the minimum width.
Bolt the two strut inners to the right hand post in the highest positions (4no holes should be visible beneath the strut inner) using 8no M16 x 60 Bolts c/w Nuts (8.8 grade). Leave the nuts and bolts loose to aid assembly. If the drag box width exceeds 750 internal fit the rear spacers (2x) and pin to the minimum width.
Right Hand Panel (Drawing 2).Position the first panel so that pockets are uppermost and level. Bolt the front strut mounting to the right hand flange at the lowest position (4no holes should be visible above the front strut mounting) using 8no M16 x 60 Bolts c/w Nuts (8.8 Grade). Leave the nuts and bolts loose to aid assembly.
If the drag box exceeds 750mm internal bolt the two strut inners to the left hand post in the highest positions (4no holes should be visible beneath the strut inner) using 8no M16 x 60 Bolts c/w Nuts (8.8 grade). Leave the nuts and bolts loose to aid assembly. If the drag box width is less than 750 internal bolt the flanged rear spacers (2x) in the two highest positions (4no holes should be visible beneath the flanged rear spacer).

Invert the Right Hand Panel so that the struts are lowermost and it is in a level plane. (By using a forklift/Telehandler or suspended on chains by the lifting points). Lower the inverted panel onto the upraised struts and pin the front strut and rear struts ensuring they are secured by bolts or "R" clips as required. Once the struts have been safely secured lift the Drag Box to align the bolts and tighten the bolts c/w nuts. 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 the 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 is 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

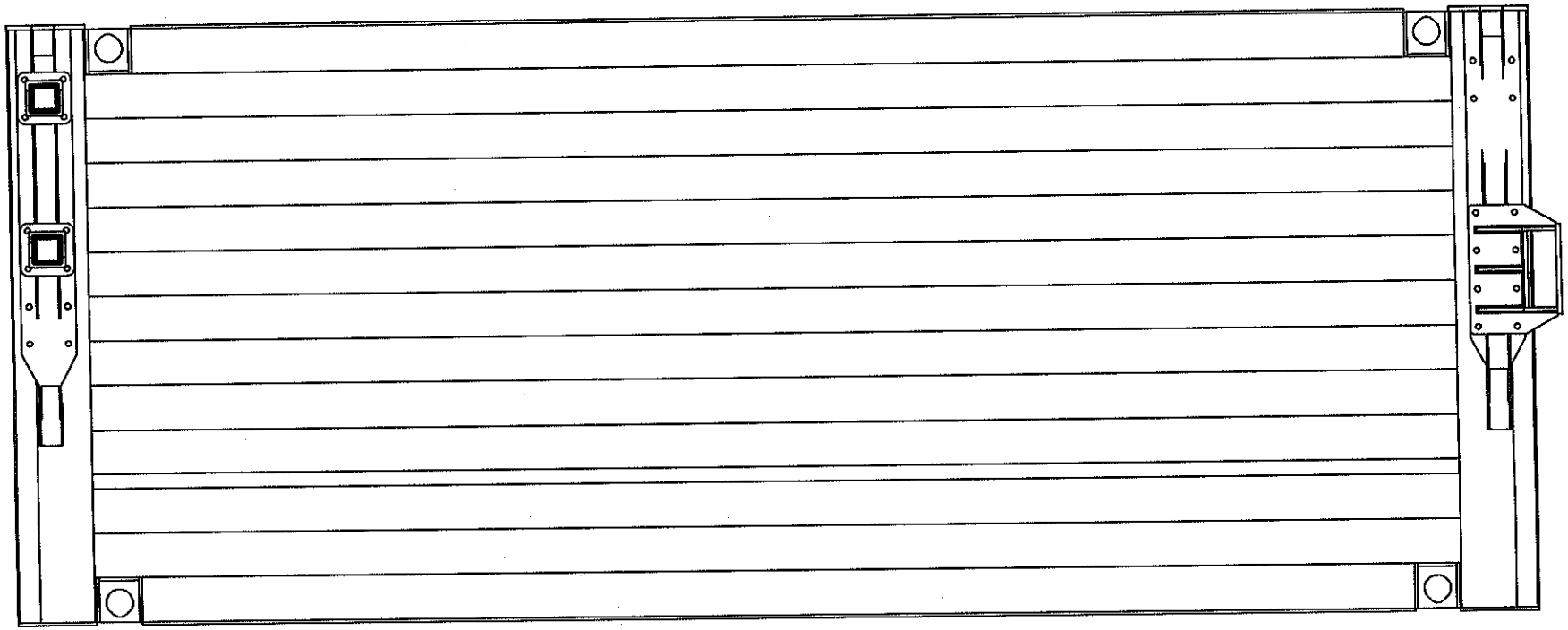
Capacity Chart – Drag Box

Mini Drag Box	3040mm x 2000mm x 66mm	25kN/m2
Mini Drag Box Top	3040mm x 1000mm x 66mm	25kN/m2
Midi Drag Box	4040mm x 2000mm x 66mm	20kN/m2
Mini Drag Box Top	4040mm x 2000mm x 66mm	20kN/m2
Maxi Drag Box	5040mm x 2000mm x 100mm	20kN/m2
Maxi Drag Box Top	5040mm x 2000mm x 100mm	20kN/m2

Box Type	Internal	External	Weight
Mini Drag Box	550-750	680-880	970 kg
Mini Drag Box	800-1150	930-1280	990 kg
Mini Drag Box	1150-1500	1280-1630	1020 kg
Mini Drag Box	1500-1850	1630-1980	1050 kg
Mini Drag Box	1850-2200	1980-2330	1080 kg
Mini Drag Box	2200-2550	2330-2680	1110 kg
Mini Drag Box	2600-2950	2730-3080	1140 kg
Mini Drag Box Top	550-750	680-880	660 kg
Mini Drag Box Top	800-1150	930-1280	690 kg
Mini Drag Box Top	1150-1500	1280-1630	716 kg
Mini Drag Box Top	1500-1850	1630-1980	742 kg
Mini Drag Box Top	1850-2200	1980-2330	768 kg
Mini Drag Box Top	2200-2550	2330-2680	794 kg
Mini Drag Box Top	2600-2950	2730-3080	820 kg
Midi Drag Box	550-750	680-880	1480 kg
Midi Drag Box	800-1150	930-1280	1495 kg
Midi Drag Box	1150-1500	1280-1630	1525 kg
Midi Drag Box	1500-1850	1630-1980	1555 kg
Midi Drag Box	1850-2200	1980-2330	1585 kg
Midi Drag Box	2200-2550	2330-2680	1615 kg
Midi Drag Box	2600-2950	2730-3080	1645 kg
Midi Drag Box Top	550-750	680-880	880 kg
Midi Drag Box Top	800-1150	930-1280	895 kg
Midi Drag Box Top	1150-1500	1280-1630	921 kg
Midi Drag Box Top	1500-1850	1630-1980	947 kg
Midi Drag Box Top	1850-2200	1980-2330	973 kg
Midi Drag Box Top	2200-2550	2330-2680	999 kg
Midi Drag Box Top	2600-2950	2730-3080	1025 kg

Maxi Drag Box	550-750	750-950	970 kg
Maxi Drag Box	800-1150	1000-1350	990 kg
Maxi Drag Box	1150-1500	1350-1700	1020 kg
Maxi Drag Box	1500-1850	1700-2050	1050 kg
Maxi Drag Box	1850-2200	2050-2400	1080 kg
Maxi Drag Box	2200-2550	2400-2750	1110 kg
Maxi Drag Box	2600-2950	2800-3150	1140 kg
Maxi Drag Box Top	550-750	750-950	660 kg
Maxi Drag Box Top	800-1150	1000-1350	690 kg
Maxi Drag Box Top	1150-1500	1350-1700	716 kg
Maxi Drag Box Top	1500-1850	1700-2050	742 kg
Maxi Drag Box Top	1850-2200	2050-2400	768 kg
Maxi Drag Box Top	2200-2550	2400-2750	794 kg
Maxi Drag Box Top	2600-2950	2750-3150	820 kg

(2)



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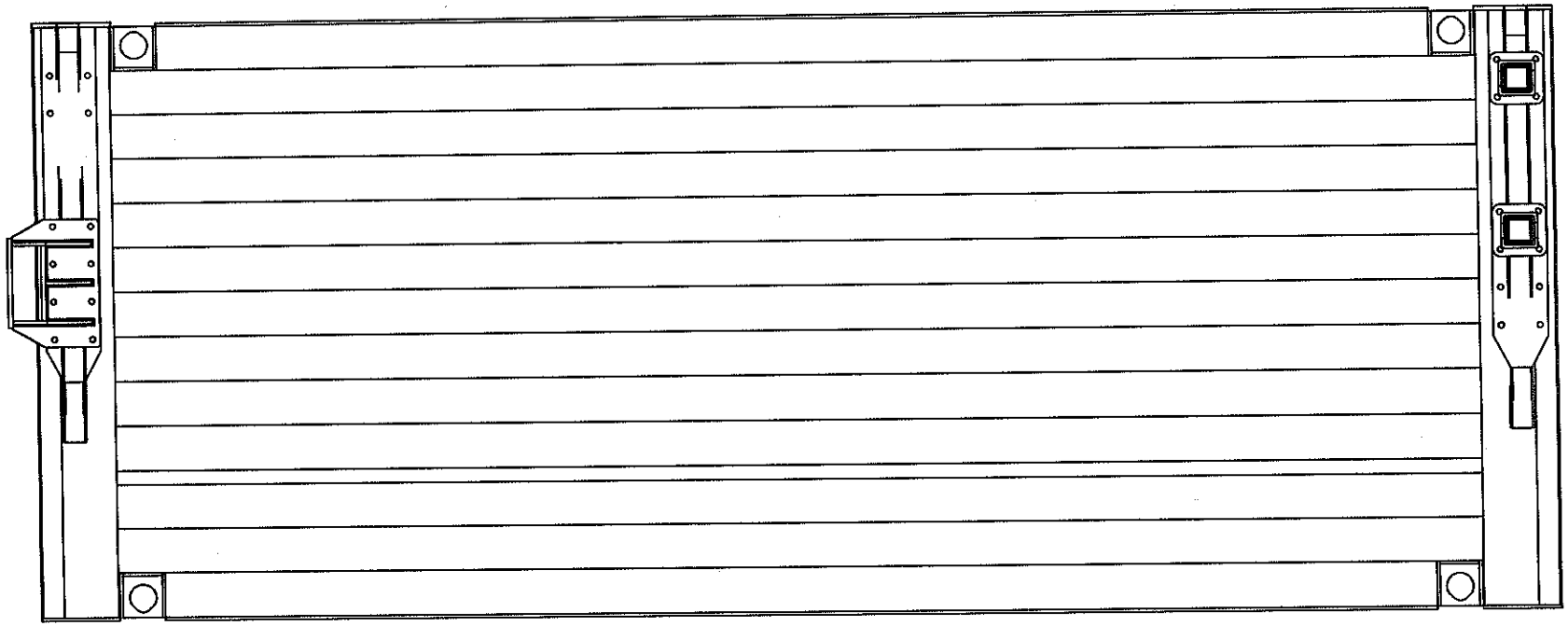

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