

GROUNDWORKS **GROUND BOXES** User Guide



Altrad Generation Hire & Sale

Support for Construction & Industry

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Trench Boxes

Backhoe Trench Box

Measurement	Base Unit	Top Unit
Length (mm)	3000	3000
Height (mm)	2000	960
Min Width External (mm)	690	690
Max Width External (mm)	2690	2690
Min Width Internal (mm)	570	570
Max Width Internal (mm)	2570	2570
Thickness (mm)	60	60
Max Clearance Between Struts (mm)	2690	2690
Max Clearance Under Lower Strut (mm)	980	-
Permissible SWL (kN/m ²)	19.40	19.40
Weight (kg)	822	441
Max Depth (mm)	2960	-

Mini Trench Box

Measurement	Base Unit	Top Unit
Length (mm)	3000	3000
Height (mm)	1950	960
Min Width External (mm)	800	800
Max Width External (mm)	3990	3990
Min Width Internal (mm)	640	640
Max Width Internal (mm)	3830	3830
Thickness (mm)	90	90
Max Clearance Between Struts (mm)	2550	2550
Max Clearance Under Lower Strut (mm)	1180	-
Permissible SWL (kN/m ²)	25.00	25.00
Weight (kg)	1075	713
Max Depth (mm)	4000	-

Trench Boxes

BV60 Trench Box

Measurement	Base Unit	Top Unit
Length (mm)	3000	3000
Height (mm)	2000	1000
Min Width External (mm)	820	820
Max Width External (mm)	3820	3820
Min Width Internal (mm)	700	700
Max Width Internal (mm)	3700	3700
Thickness (mm)	60	60
Max Clearance Between Struts (mm)	2600	2600
Max Clearance Under Lower Strut (mm)	950	-
Permissible SWL (kN/m ²)	23.50	23.50
Weight (kg)	1154	638
Max Depth (mm)	4000	-

Standard Trench Box

Measurement	Base Unit	Top Unit
Length (mm)	3400	3400
Height (mm)	2600	1320
Min Width External (mm)	940	940
Max Width External (mm)	4680	4680
Min Width Internal (mm)	760	760
Max Width Internal (mm)	4500	4500
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	2950	2950
Max Clearance Under Lower Strut (mm)	1450	-
Permissible SWL (kN/m ²)	36.41	36.41
Weight (kg)	2056	1316
Max Depth (mm)	6560	-

Trench Boxes

BV100 Trench Box

Measurement	Base Unit	Top Unit
Length (mm)	3500	3500
Height (mm)	2360	1300
Min Width External (mm)	900	900
Max Width External (mm)	3900	3900
Min Width Internal (mm)	700	700
Max Width Internal (mm)	3700	3700
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	3114	3114
Max Clearance Under Lower Strut (mm)	1540	-
Permissible SWL (kN/m ²)	39.70	39.70
Weight (kg)	2094	1368
Max Depth (mm)	6260	-

Magnum Trench Box

Measurement	Base Unit	Top Unit
Length (mm)	3400	3400
Height (mm)	4000	1320
Min Width External (mm)	960	960
Max Width External (mm)	4150	4150
Min Width Internal (mm)	760	960
Max Width Internal (mm)	3950	3950
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	2950	2950
Max Clearance Under Lower Strut (mm)	2460	-
Permissible SWL (kN/m ²)	36.41	36.41
Weight (kg)	3136	1316
Max Depth (mm)	6640	-

Drag Boxes

Drag Box 3m

Measurement	Base Unit	Top Unit
Length (mm)	3000	3000
Height (mm)	2000	1000
Min Width External (mm)	760	760
Max Width External (mm)	2660	2660
Min Width Internal (mm)	600	600
Max Width Internal (mm)	2500	2500
Thickness (mm)	80	80
Max Clearance Between Struts (mm)	2200	2200
Max Clearance Under Lower Strut (mm)	1000	-
Permissible SWL (kN/m ²)	-	-
Weight (kg)	2000	1000
Max Depth (mm)	3000	-

Drag Box 4m

Measurement	Base Unit	Top Unit
Length (mm)	4000	4000
Height (mm)	2420	1820
Min Width External (mm)	760	760
Max Width External (mm)	2660	2660
Min Width Internal (mm)	600	600
Max Width Internal (mm)	2500	2500
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	3120	3120
Max Clearance Under Lower Strut (mm)	1380	-
Permissible SWL (kN/m ²)	-	-
Weight (kg)	2510	1970
Max Depth (mm)	4240	-

Drag Boxes

Drag Box 5m

Measurement	Base Unit	Top Unit
Length (mm)	5000	5000
Height (mm)	2500	1800
Min Width External (mm)	800	800
Max Width External (mm)	2700	2700
Min Width Internal (mm)	600	600
Max Width Internal (mm)	2500	2500
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	4200	4200
Max Clearance Under Lower Strut (mm)	1470	-
Permissible SWL (kN/m ²)	-	-
Weight (kg)	3050	2100
Max Depth (mm)	4300	-

Drag Box 7m

Measurement	Base Unit	Top Unit
Length (mm)	7000	7000
Height (mm)	2420	1820
Min Width External (mm)	800	800
Max Width External (mm)	2700	2700
Min Width Internal (mm)	600	600
Max Width Internal (mm)	2500	2500
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	6120	6120
Max Clearance Under Lower Strut (mm)	1380	1380
Permissible SWL (kN/m ²)	-	-
Weight (kg)	4620	3570
Max Depth (mm)	4240	-

Rolling Strut Box

Rolling Strut Box

Measurement	Base Unit	Top Unit
Length (mm)	3400	
Height (mm)	3000	
Min Width External (mm)	1000	
Max Width External (mm)	2850	
Min Width Internal (mm)	1200	
Max Width Internal (mm)	2650	
Thickness (mm)	100	
Max Clearance Between Struts (mm)	1650	
Max Clearance Under Lower Strut (mm)	2600	
Permissible SWL (kN/m ²)	48.2	
Weight (kg)	2940	
Max Depth (mm)	3000	

Backhoe Manhole Boxes

2m Backhoe Manhole Box

Measurement	Base Unit	Top Unit
Length (mm)	2000	2000
Height (mm)	2000	960
Min Width External (mm)	1690	1690
Max Width External (mm)	3690	3690
Min Width Internal (mm)	1570	1570
Max Width Internal (mm)	3570	3570
Thickness (mm)	60	60
Max Clearance Between Struts (mm)	1600	1600
Max Clearance Under Lower Strut (mm)	980	-
Permissible SWL (kN/m ²)	38.00	38.00
Weight (kg)	1186	711
Max Depth (mm)	2960	-

2.5m Backhoe Manhole Box

Measurement	Base Unit	Top Unit
Length (mm)	2500	2500
Height (mm)	2000	960
Min Width External (mm)	1690	1690
Max Width External (mm)	3690	3690
Min Width Internal (mm)	1570	1570
Max Width Internal (mm)	3570	3570
Thickness (mm)	60	60
Max Clearance Between Struts (mm)	2100	2100
Max Clearance Under Lower Strut (mm)	980	-
Permissible SWL (kN/m ²)	30.40	30.40
Weight (kg)	1326	769
Max Depth (mm)	2960	-

Backhoe Manhole Boxes

3m Backhoe Manhole Box

Measurement	Base Unit	Top Unit
Length (mm)	3000	3000
Height (mm)	2000	1000
Min Width External (mm)	1690	1690
Max Width External (mm)	3690	3690
Min Width Internal (mm)	1570	1570
Max Width Internal (mm)	3570	3570
Thickness (mm)	60	60
Max Clearance Between Struts (mm)	2630	2630
Max Clearance Under Lower Strut (mm)	980	-
Permissible SWL (kN/m ²)	32	32
Weight (kg)	1190	680
Max Depth (mm)	3000	-

BV100 Manhole Boxes

BV100 Manhole Box 2.5m

Measurement	Base Unit	Top Unit
Length (mm)	2500	2500
Height (mm)	2360	1470
Min Width External (mm)	1900	1900
Max Width External (mm)	4900	4900
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4700	4700
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	2080	2080
Max Clearance Under Lower Strut (mm)	1540	-
Permissible SWL (kN/m ²)	55-70	55-70
Weight (kg)	2026	1449
Max Depth (mm)	5300	5300

BV100 Manhole Box 3.0m

Measurement	Base Unit	Top Unit
Length (mm)	3000	3000
Height (mm)	2360	1470
Min Width External (mm)	1900	1900
Max Width External (mm)	4900	4900
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4700	4700
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	2580	2580
Max Clearance Under Lower Strut (mm)	1540	-
Permissible SWL (kN/m ²)	46-40	46-40
Weight (kg)	2226	1589
Max Depth (mm)	5300	-

BV100 Manhole Boxes

BV100 Manhole Box 3.5m

Measurement	Base Unit	Top Unit
Length (mm)	3500	3500
Height (mm)	2360	1470
Min Width External (mm)	1900	1900
Max Width External (mm)	4900	4900
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4700	4700
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	3050	3080
Max Clearance Under Lower Strut (mm)	1540	-
Permissible SWL (kN/m ²)	39-70	39-70
Weight (kg)	2426	1729
Max Depth (mm)	5300	-

BV100 Manhole Box 4.0m

Measurement	Base Unit	Top Unit
Length (mm)	4000	4000
Height (mm)	2360	1470
Min Width External (mm)	1900	1900
Max Width External (mm)	4900	4900
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4700	4700
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	4080	4080
Max Clearance Under Lower Strut (mm)	1540	-
Permissible SWL (kN/m ²)	31-85	31-85
Weight (kg)	2616	1869
Max Depth (mm)	5300	-

BV100 Manhole Boxes

BV100 Manhole Box 4.5m

Measurement	Base Unit	Top Unit
Length (mm)	4500	4500
Height (mm)	2360	1470
Min Width External (mm)	1900	1900
Max Width External (mm)	4900	4900
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4700	4700
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	3580	3580
Max Clearance Under Lower Strut (mm)	1540	-
Permissible SWL (kN/m ²)	30-60	30-60
Weight (kg)	3326	2329
Max Depth (mm)	5300	-

BV100 Manhole Box 5.0m

Measurement	Base Unit	Top Unit
Length (mm)	5000	5000
Height (mm)	2360	1470
Min Width External (mm)	1900	1900
Max Width External (mm)	4900	4900
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4700	4700
Thickness (mm)	100	100
Max Clearance Between Struts (mm)	4580	4580
Max Clearance Under Lower Strut (mm)	1540	-
Permissible SWL (kN/m ²)	24-50	24-50
Weight (kg)	3576	2509
Max Depth (mm)	5300	-

Standard Manhole Boxes

Standard Manhole Box 2.5m

Measurement	Base Unit	Top Unit
Length (mm)	2500	2500
Height (mm)	2500	1500
Min Width External (mm)	1900	1900
Max Width External (mm)	5090	5090
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4890	4890
Thickness (mm)	-	-
Max Clearance Between Struts (mm)	2100	2100
Max Clearance Under Lower Strut (mm)	1450	1450
Permissible SWL (kN/m ²)	36-41	36-41
Weight (kg)	2289	1997
Max Depth (mm)	5500	5500

Standard Manhole Box 3.0m

Measurement	Base Unit	Top Unit
Length (mm)	3000	3000
Height (mm)	2500	1500
Min Width External (mm)	1900	1900
Max Width External (mm)	5090	5090
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4890	4890
Thickness (mm)	-	-
Max Clearance Between Struts (mm)	2500	2500
Max Clearance Under Lower Strut (mm)	1450	1450
Permissible SWL (kN/m ²)	36-41	36-41
Weight (kg)	2489	2138
Max Depth (mm)	5500	5500

Standard Manhole Boxes

Standard Manhole Box 3.5m

Measurement	Base Unit	Top Unit
Length (mm)	3500	3500
Height (mm)	2500	1500
Min Width External (mm)	1900	1900
Max Width External (mm)	5090	5090
Min Width Internal (mm)	1700	1700
Max Width Internal (mm)	4890	4890
Thickness (mm)	-	-
Max Clearance Between Struts (mm)	2900	2900
Max Clearance Under Lower Strut (mm)	1450	1450
Permissible SWL (kN/m ²)	36-41	36-41
Weight (kg)	3176	2320
Max Depth (mm)	5500	5500

Operating & Safety Instructions

These instructions are provided to give information on the safe use of the Drag and Manhole. All users must read them to ensure that it is correctly used and that incorrect use does not lead to dangerous situations.

Particular attention should be paid to ensuring that the correct equipment is selected to suit the ground conditions. Std trench box is designed and tested to withstand ground pressure highlighted in data tables. If ground pressure could exceed this or if the ground is weak or unstable then a temporary works design should be sought from the design department.

Where there is any doubt about the ground pressure being generated call our experts.

Ground Box Installation Instructions

The Std trench box is designed to be driven into the ground and extracted using the corner posts. Attempting to drive it in at any other point will result in damage and reduce the efficiency of the equipment.

- Excavate trench to 1.00m depth moving any spoil safely away from the edge of the excavation.
- Lower trench box into the excavation using four leg lifting chains.
- Excavate soil from within trench box and push down on each orange corner plate, ensuring no more than 150mm increments using excavator bucket.
- If using end panels, dig and push in similar fashion to box ensuring that all ground is supported.
- Continue to dig and push until trench box is at required depth. If a top box is required, allow a minimum of 950mm upstand to allow for edge protection when attaching top box.
- Connect top box using trench box connector and secure using connector pins and R clips.
- Dig and push to required depth. Repeat step if using additional top boxes.
- Attach TrenchGuard & LadderSafe module to top edge of panel (see TrenchGuard & Laddersafe User Guide)

Extraction Process

- Reversal of installation process using a snatch chain to apply force to each corner of panel to break any adhesion caused by ground settlement.
- Always backfill and compact when extracting trench box and never leave any unsupported ground.

Maintenance

- Inspect all panels prior to entering any excavation at start of shifts
- Inspect all pins and r clips prior to entry
- Inspect all handrail components regularly and ensure that all screw threads are tight

Summary Do's & Don'ts

Do:

- Use all relevant PPE at all times
- Ensure that all operatives are familiar with the safety and operating instructions
- Check that all connecting pins are in place and properly secured with R clips.
- Follow the basic maintenance instructions.
- Use a ladder and Laddersafe platform to enter excavations.
- Provide and use all edge protection equipment supplied.
- Support all stages of excavation down to required depth.
- Use Generation end panels to close and support open ends of excavations.
- Inspect and use all red lifting points prior to and during lifting and ensure all personnel are away from operation and excavator slewing area.
- Always take measures to avoid risk of falls from height.
- Always take measures to avoid trapping of fingers or limbs in equipment.

Do not:

- Move box with personnel inside.
- Move boxes by pulling or lifting on struts or spacers.
- Use more than three extension boxes unless ground pressure has been calculated to be less than 39.7 kN/m².
- Push box down by more than recommended 150mm increments.
- Use more than the allocated strut/spindles & spacer bars or go over 3820mm in width when using struts or 4100mm in width when using spindles and spacer assemblies.
- Use unsafe lifting equipment or practices.
- Hammer the panels with the excavator.

- Use the struts to enter BV100 Standard Box, always use properly secured ladder and Generation Laddersafe platform.
- Enter unsupported parts of the excavation.
- Allow personnel inside box during installation.
- Apply lateral loads to extensions, struts or spindles (eg: with trench sheets).
- Strike the struts when installing or extracting.
- Use the struts to move or extract the box, use lifting points only.
- Drag the box in anyway.
- 'Fly' the box above the base of the excavation on unsupported ground.

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