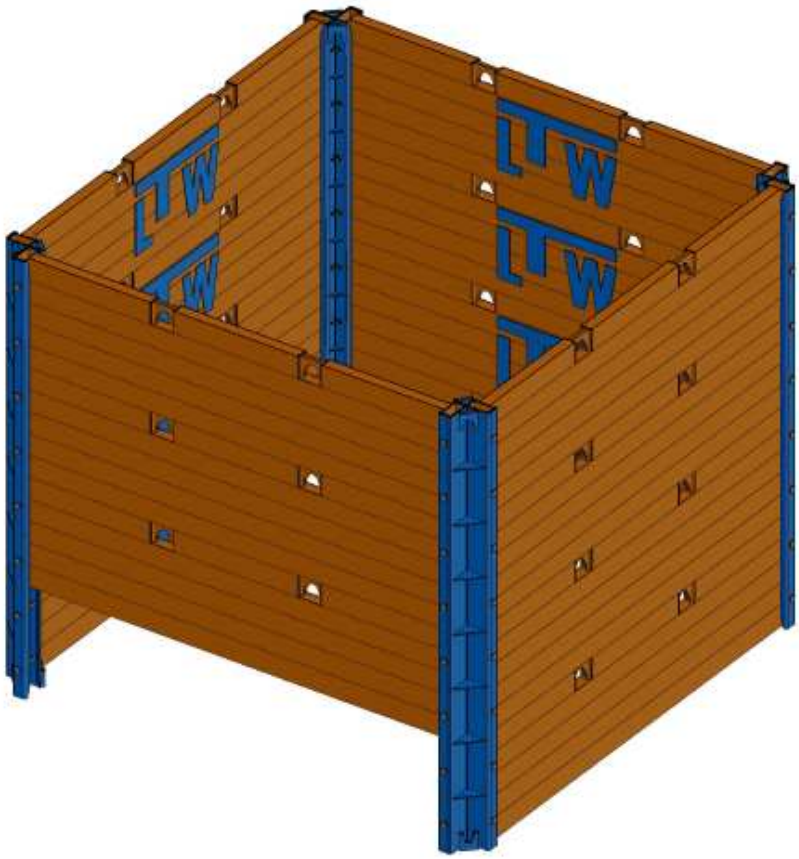
ASSEMBLY AND OPERATING MANUAL
LTW MULTIBOX



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General Instructions

Intended Use

The LTW MULTIBOX is available for a maximum trench depths of ~3,00m.

The following regulations and rules have to be followed in their valid version:

- *Regulations of the BG-Fachausschuss Tiefbau (technical committee civil and underground engineering)*
- *DIN 4124 Baugruben & Gräben (excavation pits and trenches)*
- *DIN EN 13331 Teil 1 & 2 Grabenverbaugeräte (part 1 and 2 construction equipment)*
- *Regeln für Sicherheit und Gesundheit bei der Arbeit (rules for safety and health during work)*
- *Unfallverhütungsvorschriften/Arbeitsschutzvorschriften (regulations for the prevention of accidents and safety at work rules)*

Please follow the instructions making use of our Slide rail systems.

Lifting & Transportation

The shoring may only be attached at the corresponding eyes and openings and/or lifting accessories.

Lifting chains must be chosen to suit the weight being handled.

To prevent the accidental detachment of the load use only load hooks with safety catches.

The allowed tensile forces have to be kept in any cases.

Transportation has to be carried out next to soil and unneeded oscillations have to be avoided.

It is prohibited to stand within the pivoting range of the excavator or crane and beneath suspended loads.

When handling and removing the shoring, watch out for overhead contact lines (power cables).

A load operator must stand to the front of the excavator and be in eye contact with the machine operator.

Measures to reduce hazards

The safety of persons on site must be enhanced with the aid of signs, cones, warning tapes and/or safety staff specially deployed on site for this purpose.

Neighbouring traffic flow has to be made possible by means of safety staff if needed.

Personnel must wear protective clothing (helmet/safety shoes/gloves).

The risk of instability as a consequence of wind loads when setting up or using the shoring must be considered.

The shoring must be lowered onto level and firm ground. Where the ground is sloping or uneven, the shoring should be set up, if possible, at right angles to the slope.

Maintenance & Repair

Before use, all shoring components must be checked for their correct function.

Faulty or deformed parts must be replaced in any case.

Minor repairs can be carried out by the user, after consultation with LTW.

There is no warranty on incorrectly performed repairs and the use of non-original parts.

According to intenseness of use, the components should be painted with anticorrosion paint every two years.

Technical Characteristics

SHORING PANELS

Panels t = 60 mm

Panel length L [m]	Panels height H [m]	Working width b_C [m]	Limit state design load e_d [kN / m²]	Panel weight G_{PL} [kg]
1,50	*0,60*	*~1,57*	*82,7*	*70*
2,00	*0,60*	*~2,07*	*69,3*	*85*
2,50	*0,60*	*~2,57*	*43,2*	*100*
3,00	*0,60*	*~3,07*	*29,5*	*120*

CORNER RAILS

Rail length [m]	Limit state design moment M_d [kNm]	Rail weight G_{Tr} [kg]
1,80	*48,4*	*61*
2,40	*48,4*	*78*
3,00	*48,4*	*92*

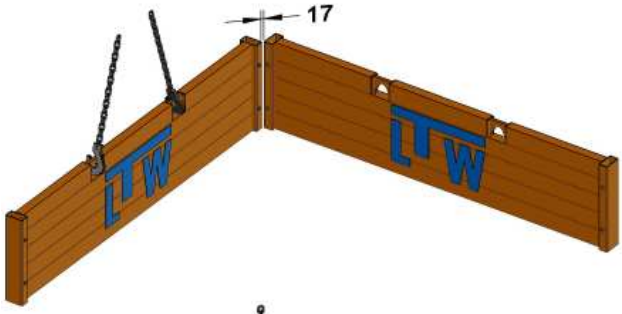
ACCESSORIES

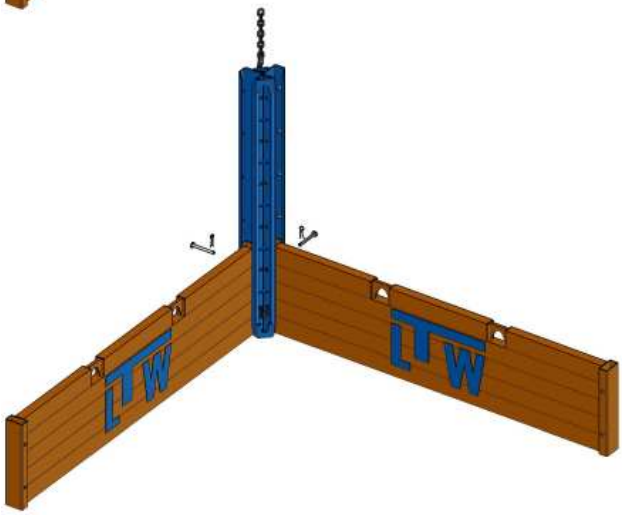
Description	Dimension	specified use for	Weight [kg]
bolt	*∅20 * 161*	*connection between rail and panels*	*0,4*
locking clip	*∅5*		*0,1*

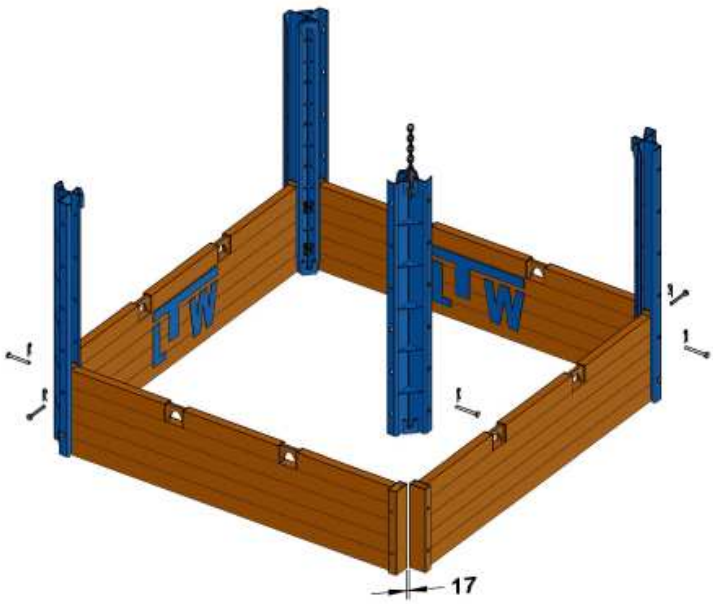
TENSILE FORCES

lifting eyes at the rail head **R_d = 226 kN**
lifting eyes at the panels head **R_d = 194 kN**

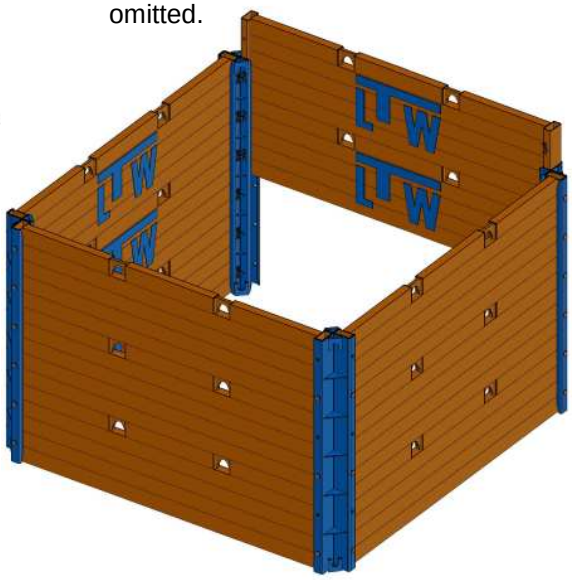
Installation Instruction







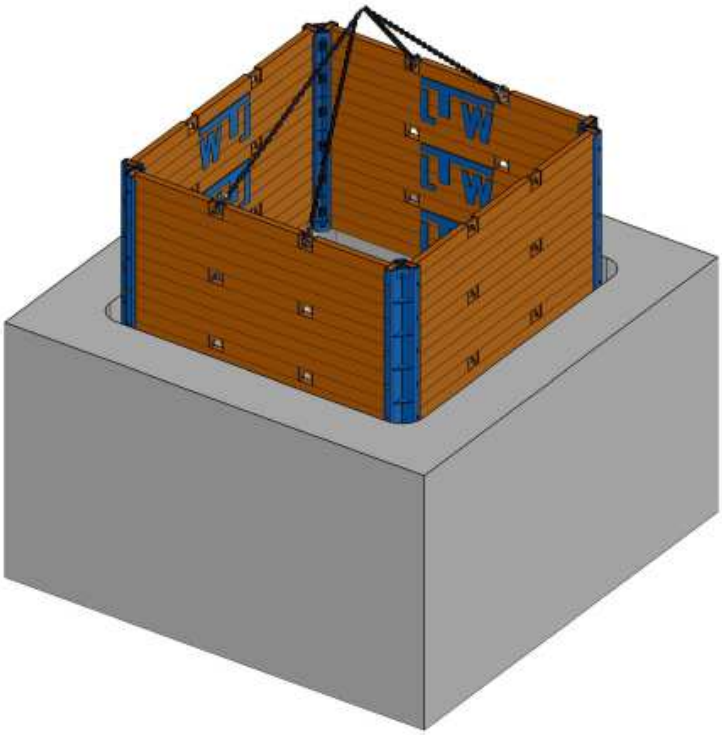
- Connect the lifting hooks to the first shoring panel, place it upright onto a flat and firm ground and secure against tipping.
- Connect the lifting hooks to the second shoring panel, place it square and secure against tipping. The perfect distances between the two free side parts should be ~17mm.
- Pick up the first corner rail with an appropriate lifting device, raise it over the panels and insert the guidance's over the side part of the panels. Connect the panels with the connecting bolts ∅ 20*161mm and secure with locking clips.
- **Make sure, that the bolts ∅ 20*161mm must be inserted from the outside to the inside of the corner rail !**
- Place the 3. and 4. shoring panels square and secure against tipping. The corner rails are now guided with the guidance over the side parts of the already erected panels. The further installation is effected as described before, until all four panels and corner rails had been completed, connect the panels with the connecting bolts ∅ 20*161mm secure with the locking clips. The lower frame is now completed.
- Insert the further panels and secure them with bolts and locking clips in order to complete the Mulitbox.
- If culverts are required in the lower area, a maximum of two panels can be omitted.



Installation Instruction

Place in position method

The LTW MULTIBOX is placed into the totally pre-excavated trench.
The place in position method is only allowed if the following conditions are given:



- temporary steady soil
- outside of the sphere of influence of buildings and structures
- outside of the sphere of influence of circulation spaces and endangered lines
- Settlements can be accepted

The ground is considered as temporary firm, if no mayor collapses is noted in the period from the start of the excavation until the insertion of the shoring.

- Pre-excavation of full depth and approx. 10 cm wider than the pit will be.
- Connect the lifting hooks into four lifting eyes of the panels.
- Place the completely assembled MULTIBOX as a whole into the entirely pre-excavated trench by means of lifting tools and appropriate lifting accessories.
- Observe the details regarding weights as per our technical data sheet.
- The gab between the trench walls and the inserted shoring unit must be backfilled and compacted.
- The top edge of the shoring must overlap the surrounding site by at least 5cm!

Re-Installation

According to compacting possibilities bring in 0,50m filling material. Lift the LTW MULTIBOX by the filled height. Finally compact the backfill.

Repeat this procedure as described until the shoring can be lifted out of the trench.

You should only use the designated lifting eyes for lifting the shoring components.

It is prohibited to stand within the pivoting range of the excavator or crane and beneath suspended loads.