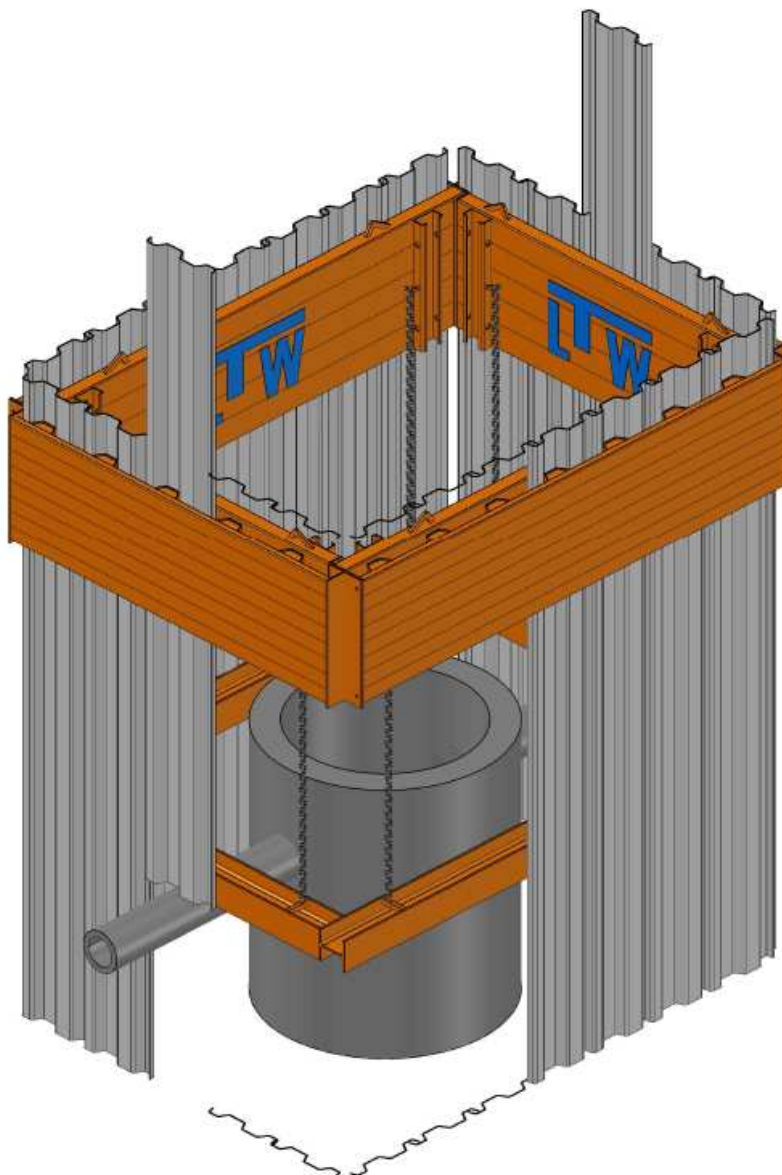


ASSEMBLY AND OPERATING MANUAL

LTW Manhole Pile Guide Box



Manufacturer: **LTW Tiefbauvertriebs GmbH**
Holter Weg 11
D – 41836 Hückelhoven-Brachelen

Phone: +49 (0) 24 62 / 2009 0
Fax: +49 (0) 24 62 / 2009 15
e-mail: info@ltw-verbau.de
homepage: http:\\ www.LTW-Shoring.com



General Instructions

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 und 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)

Our shoring components have the GS-Sign „Certified Safety“.

Please follow the instructions making use of our Pile Guide Box.

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.

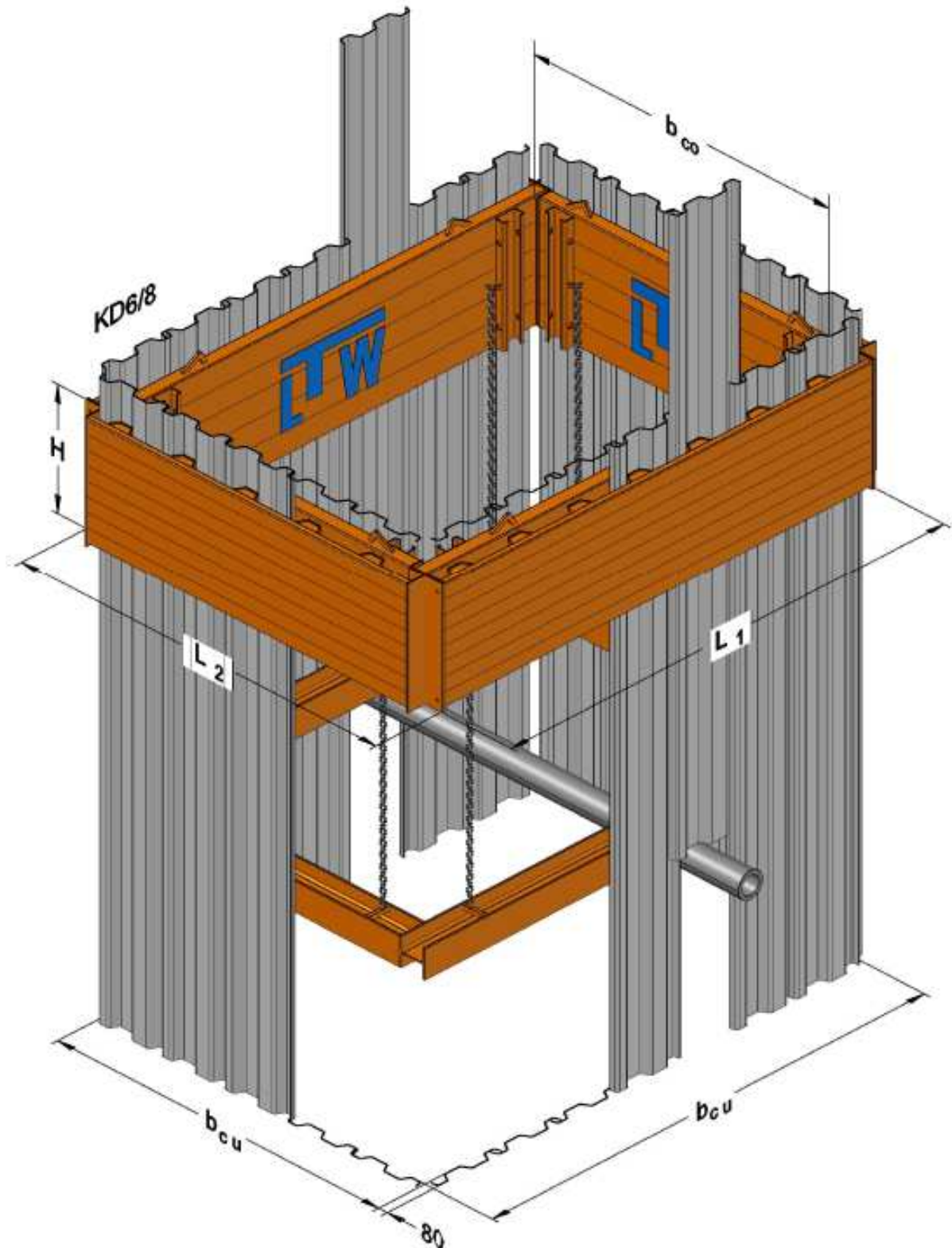
Faulty or deformed parts must be replaced in any case.

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.

System view



- 1 DK – Long Side
- 2 DK – Front End

L Plate Lengths

b_{cu} working width between sheets
 b_{co} working width inside plates



Technical Characteristics

DK – Long Side Plate $t_{PI\text{-inside}} = 120 \text{ mm}$ for trench sheets type KD 6/8

Plate-length L [m]	Plate-height H [m]	Interior width between plates b_{co} [m]	Interior width betw. sheets b_{cu} [m]	Exterior width b [m]	Number of trench sheets N per plate	Limit state design beam load q_d [kN / m]	Weight Plate G_{PL} [kg]
3,62	1,00	~3,39	~3,63	~3,93	6 * KD6	97,0	865
4,03	1,00	~3,80	~4,04	~4,35	7 * KD6	78,1	955
4,84	1,00	~4,61	~4,85	~5,16	8 * KD6	96,0	1.315
5,44	1,00	~5,21	~5,45	~5,76	9 * KD6	76,0	1.460
5,94	1,00	~5,71	~5,95	~6,26	10 * KD6	63,7	1.585

DK – Front End Plate $t_{PI\text{-inside}} = 120 \text{ mm}$ for trench sheets type KD 6/8

Plate-length L [m]	Plate-height H [m]	Interior width between plates b_{co} [m]	Interior width betw. sheets b_{cu} [m]	Exterior width b [m]	Number of trench sheets n per plate	Limit state design beam load q_d [kN / m]	Weight Plate G_{PL} [kg]
3,33	1,00	~2,76	~3,00	~3,31	5 * KD6	167,1	715
3,92	1,00	~3,35	~3,59	~3,90	6 * KD6	113,5	835
4,34	1,00	~3,77	~4,01	~4,32	7 * KD6	89,7	920

Tensile Forces

lifting eyes at the plate head $R_d = 229 \text{ kN}$



Trench sheets, steel quality S275JRC

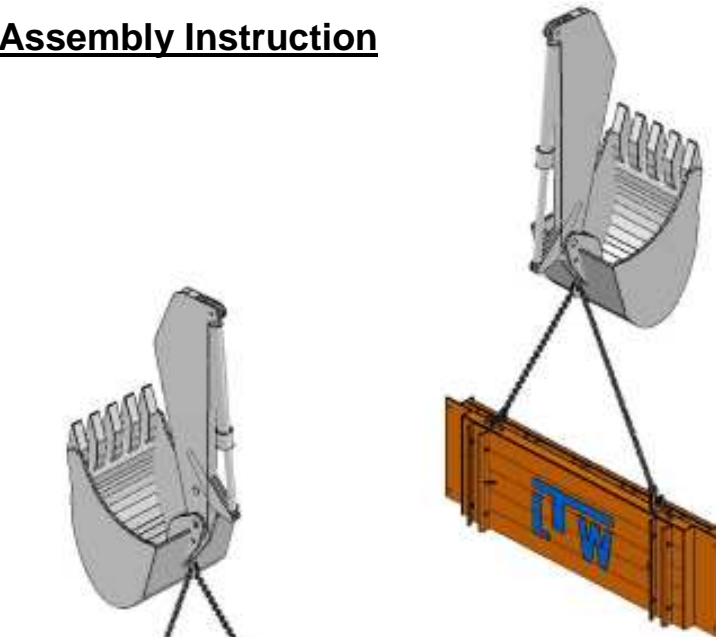
KD 6/8

Type	Width b [mm]	Height h [mm]	Thickness t [mm]	Section Modulus W_y [cm ³ /m]	Moment of inertia I_y [cm ⁴ /m]	Bending Moment M_d [kNm/m]	Weight Single Pile [kg/m]	Weight Wall [kg/m ²]
KD 6/8	600	80	8	242	969	60,5	50,0	83,3

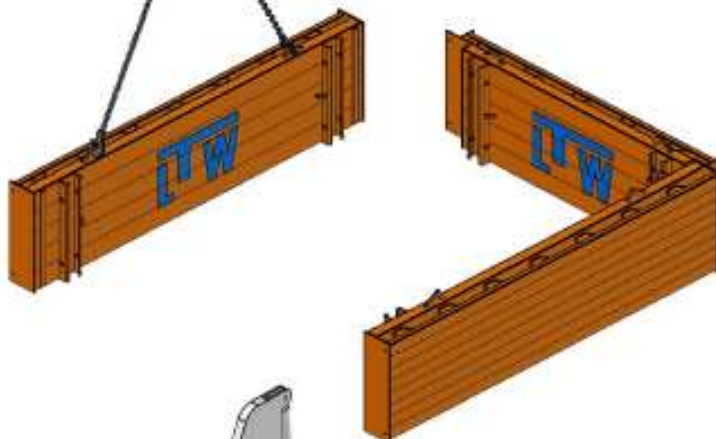
Accessories

Description	Dimension	Req. qty. per Manhole
Hexagon Screws	M20 * 50	8
Washers	A22	8

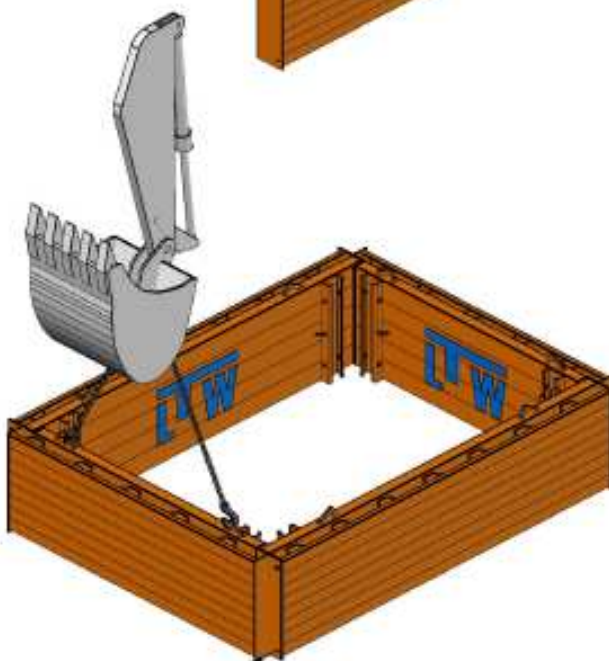
Assembly Instruction



Place the first Front End Plate on flat and firm ground. Secure it against tilting.



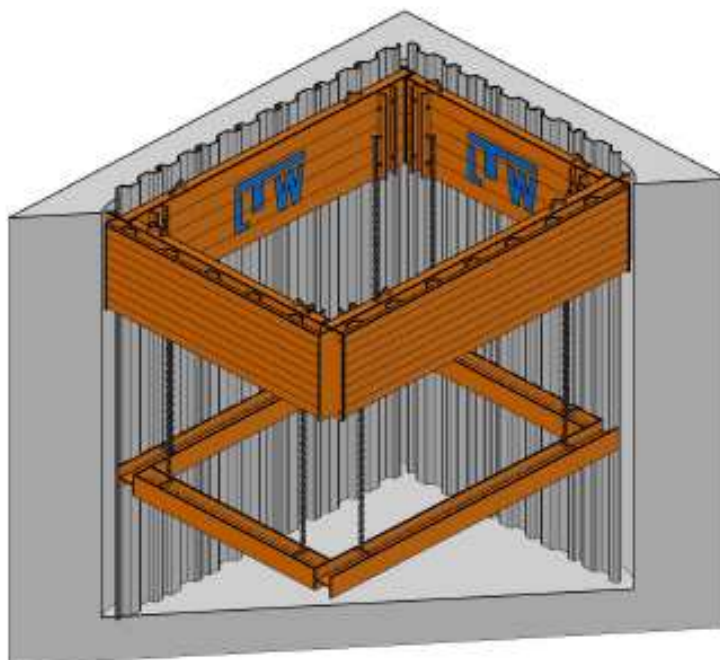
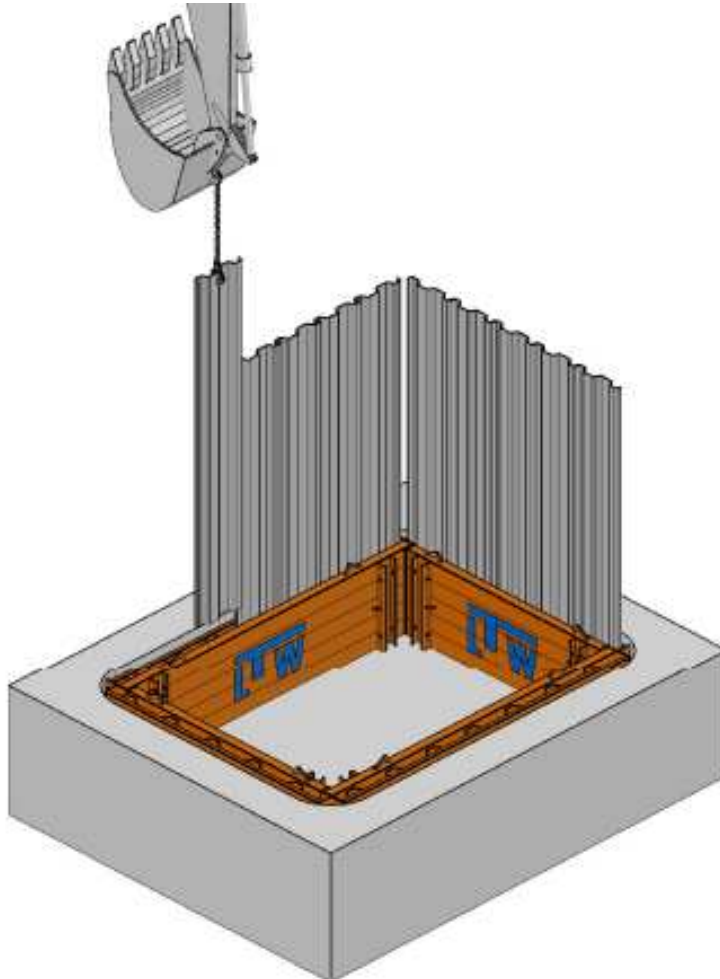
Insert both Long Side Plates sideways in the receptacles and align rectangular.



Place the second Front Side Plate in the receptacles and align it; secure it with hexagon screws M20*50.



Installation Instruction



The shoring must be close to the ground. The limiting values for the max. loads have to be kept strictly.

Pre-Excavation max. 1,00 m and approx. ~10cm wider than the shaft dimension.

Connect the lifting hooks into all four lifting eyes of the front side plates. Place the completely assembled Frame into the pre-excavated trench. Observe the details regarding weights as per our technical data sheet.

Fill the gap between the trench walls and the inserted shoring plates and compact it!

Place the trench sheets into the guidance's between inner and outer plate and press-in using the excavator bucket. The guidance's in between the inner and outer plate will ensure that the trench sheets are properly guided and kept. The lowering of the trench sheets is effected in turn with the excavation. The trench sheets have to be pressed in by the excavator bucket, or by means of vibration (and not "hammering" with the bucket).

Excavate about further 0,5m and press in the trench sheets by turn. Repeat this procedure until reaching the required trench depths.

When service lines crossing the trench, the installation of the trench sheet concerned, is effected up to the summit of the crossing. Lock this trench sheet(s) against further sliding. Underneath the service line it has to be shored conventionally e.g. with timber.

Depending on soil conditions and depths and if buildings at risk of settlements are close to the excavation, wailers have to be provided and installed on site. These have to be chosen according to static requirements and must be checked upon every case of operation. The site specific engineering will report position and rating of the required wailer.

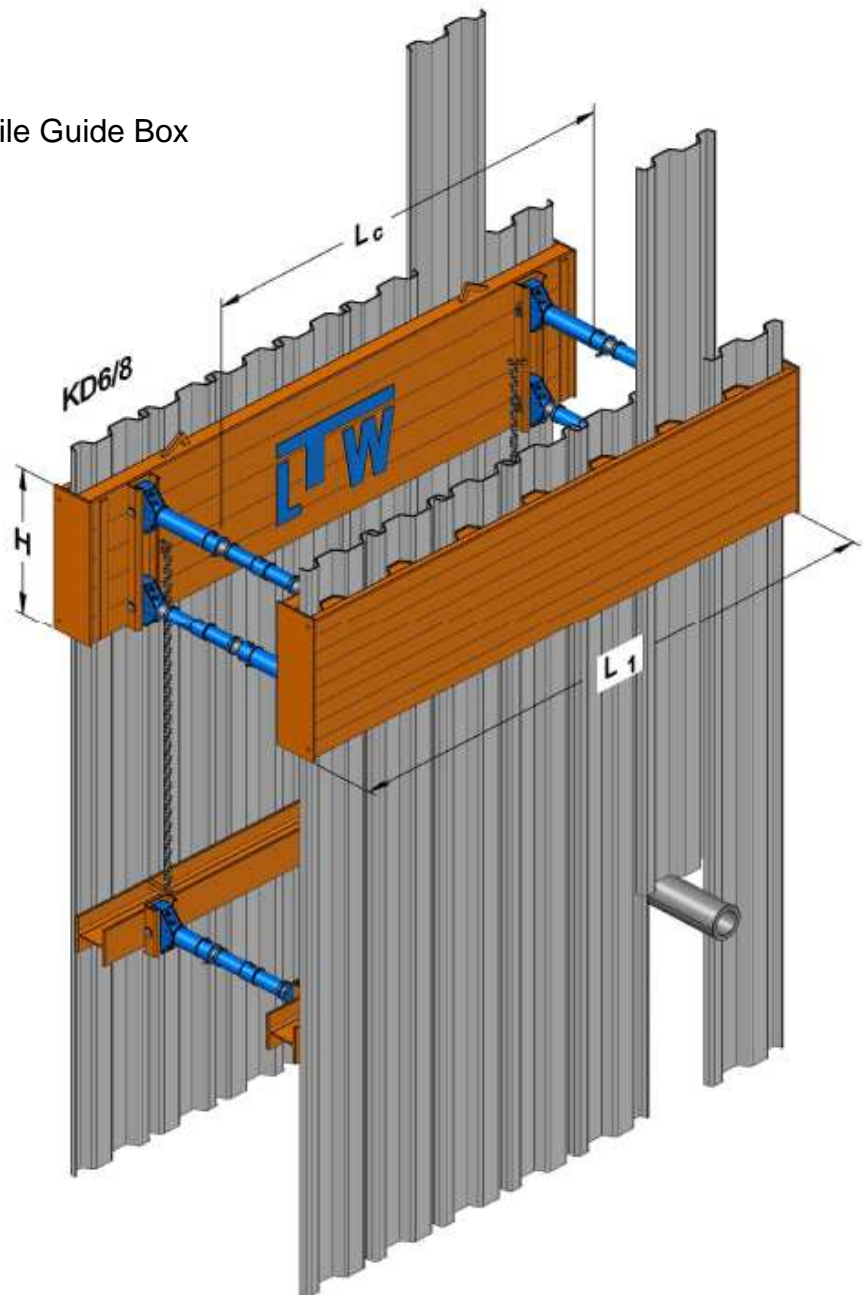
ASSEMBLY AND OPERATING MANUAL

LTW Manhole Pile Guide Box



System view

Long Side Plates used as Pile Guide Box



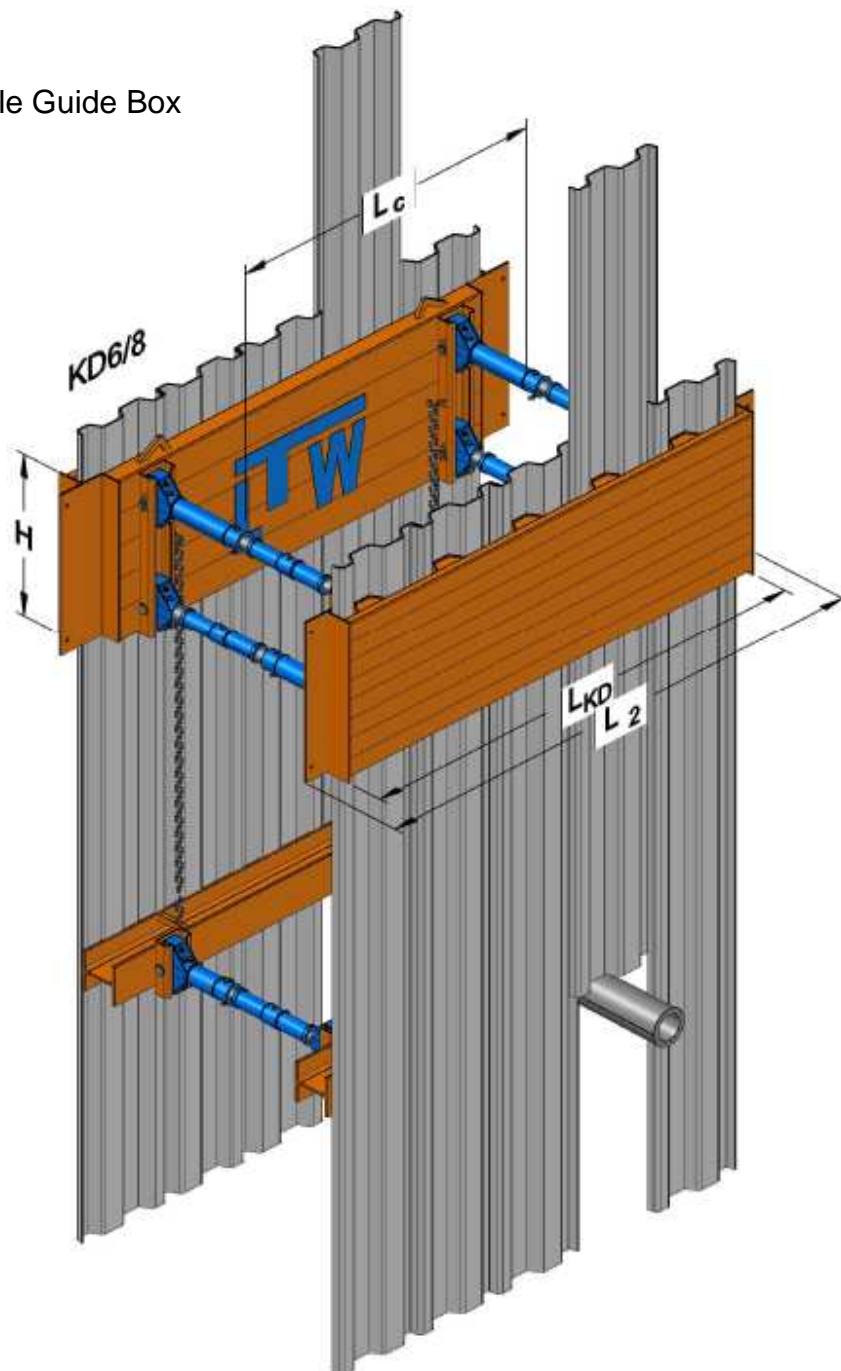
Technical Data

trench sheets type KD 6/8 $t_{PI\text{-inside}} = 120 \text{ mm}$

Plate length L [m]	Plate height H [m]	Pipe culvert length L _c [m]	Number of trench sheets n per plate	Limit state design beam load q _d [kN / m]	Plate weight G _{PL} [kg]	Box weight G _E [kg]
3,62	1,00	2,67	6 * KD6	97,0	865	2.020
4,03	1,00	3,08	7 * KD6	78,1	955	2.190
4,84	1,00	3,89	8 * KD6	96,0	1.315	2.910
5,44	1,00	4,49	9 * KD6	76,0	1.460	3.200
5,94	1,00	4,99	10 * KD6	63,7	1.585	3.450

System view

Front End Plates used as Pile Guide Box



Technical Data

trench sheets type KD 6/8 $t_{PI\text{-inside}} = 120 \text{ mm}$

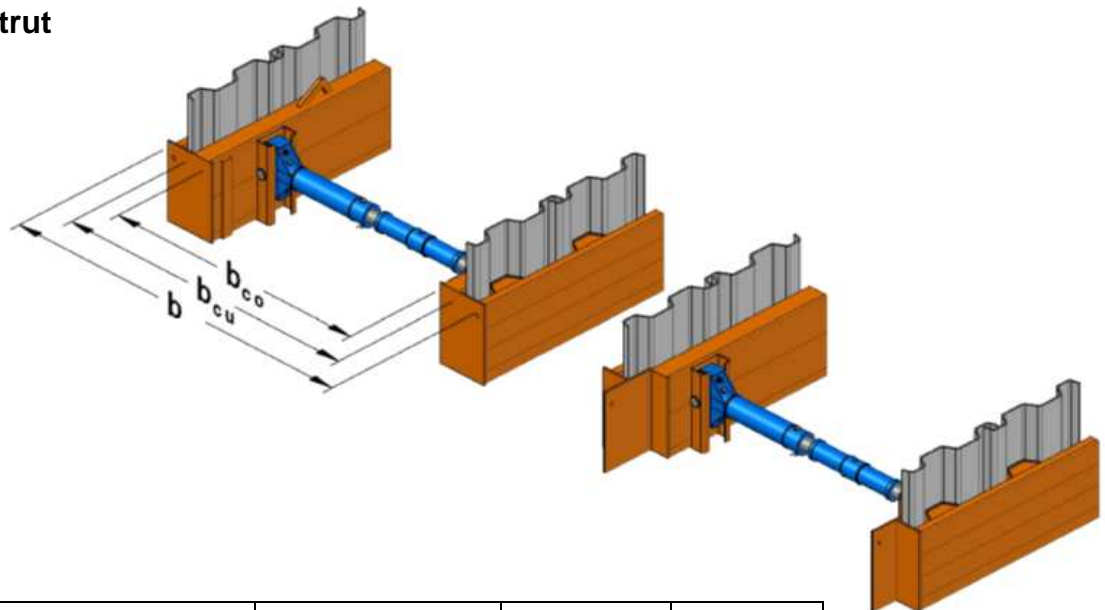
Plate length L [m]	Lengths of shoring with sheets L_{KD} [m]	Pipe culvert length L_c [m]	Number of trench sheets n per plate	Limit state design beam load q_d [kN / m]	Plate weight G_{PL} [kg]	Box weight G_E [kg]
3,33	~3,01	~2,10	5 * KD6	167,1	715	1.710
3,92	~3,60	~2,69	6 * KD6	113,5	835	1.950
4,34	~4,02	~3,11	7 * KD6	89,7	920	2.120

ASSEMBLY AND OPERATING MANUAL

LTW Manhole Pile Guide Box

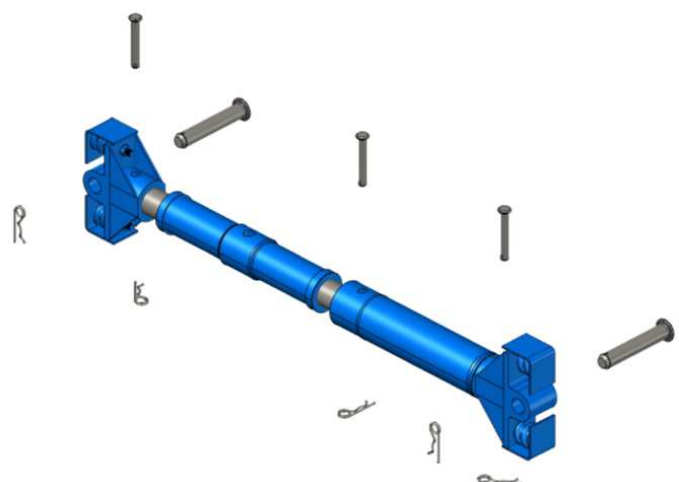


Standard Strut



Brace Extension [m]	inner working width between plates b_{co} [m]	inner working width between sheets b_{cu} [m]	shoring width KD 6/8 b [m]	Weight G [kg]
<i>without</i>	0,99 - 1,29	1,23 - 1,53	1,54 - 1,84	71,0
0,30	1,29 - 1,59	1,53 - 1,83	1,84 - 2,14	15,5
0,50	1,49 - 1,79	1,73 - 2,03	2,04 - 2,34	20,0
0,80	1,79 - 2,09	2,03 - 2,33	2,34 - 2,64	26,7
1,00	1,99 - 2,29	2,23 - 2,53	2,54 - 2,84	31,1
1,50	2,49 - 2,79	2,73 - 3,03	3,04 - 3,34	42,3
2,00	2,99 - 3,29	3,23 - 3,53	3,54 - 3,84	53,4
2,50	3,49 - 3,79	3,73 - 4,03	4,04 - 4,34	64,5

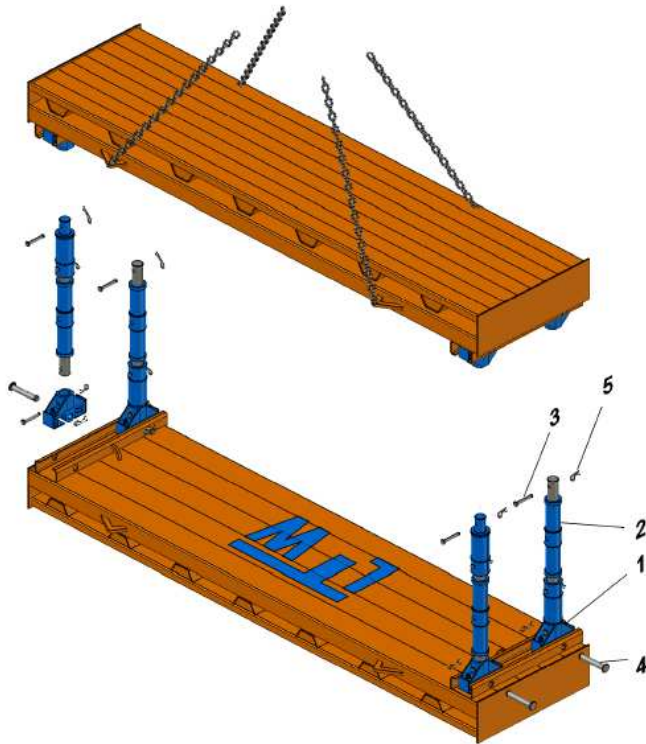
A strut unit consists of two spring mushrooms, the strut and, if required a brace extension.



Spring Mushroom
Standard Strut
Brace Extension

Bolt \varnothing 20*148 mm with locking clip
Bolt \varnothing 40*226 mm with locking clip

Assembly Instruction



- | | | | | | |
|---|---------------|---|----------------------------------|---|--------------|
| 1 | Spring Holder | 3 | Bolt $\varnothing 20 \times 148$ | 5 | Locking Clip |
| 2 | Strut | 4 | Bolt $\varnothing 40 \times 226$ | | |

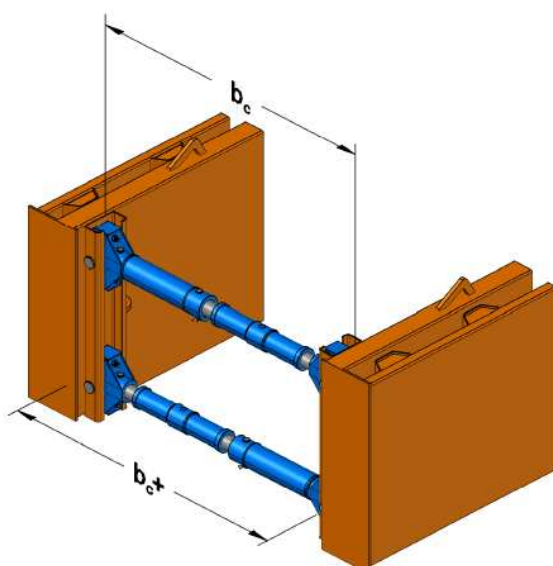
Place the Plate on the attachment points facing upwards.

Place 4 spring spindle holders in their allocated places and secure with bolts $\varnothing 40 \times 226$ mm and locking clips.

Put the struts and extension pipes, respectively staggered, into the spring spindle holders/mushrooms (shoring width up to 2,0m at one plate - greater widths at $\varnothing 20 \times 148$ mm and locking clips.

Per strut unit brace extensions up to a maximum lengths of 3,0m can be used.

After mounting all struts, one plate is connected to the corresponding lifting/transportation points at the top of the plate and at the bottom. Lift the second plate above the first plate. Position carefully so that the spring holder align with the struts assemblies. Carefully and slowly lower into place. Secure it with bolts $\varnothing 20 \times 148$ mm and locking clips.



Adjust the struts to the desired trench width. (Fine adjustment).

Take care to ensure, that the lower struts are adjusted wider than the top struts.

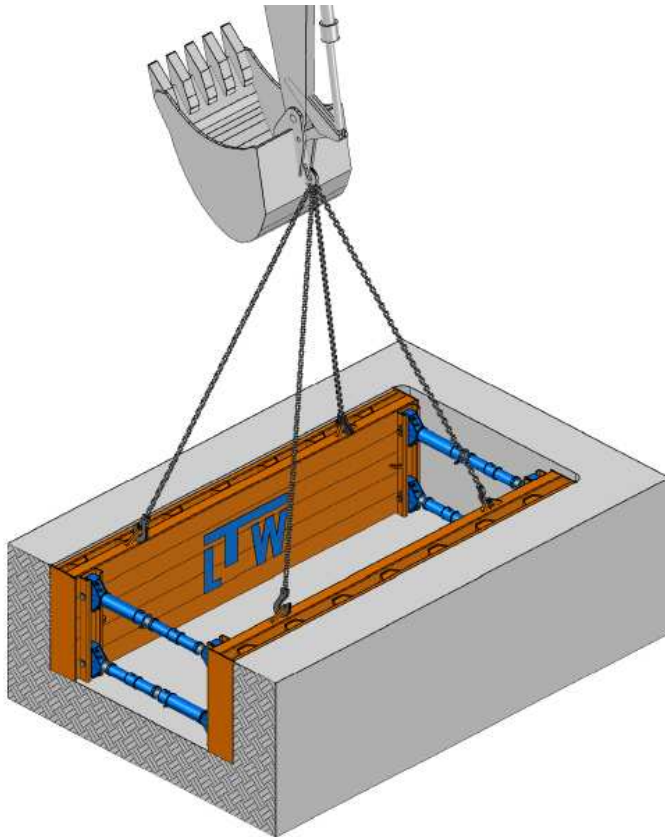
You must achieve an „A-Position“ in the Pile Guide Box.

Trench width at the top must be smaller than at the bottom.



Installation Instruction

The shoring must be without gap and close to the ground. The limiting values for the max. loads have to be kept strictly. Single shoring boxes may only be used if the front and rear faces are properly secured.

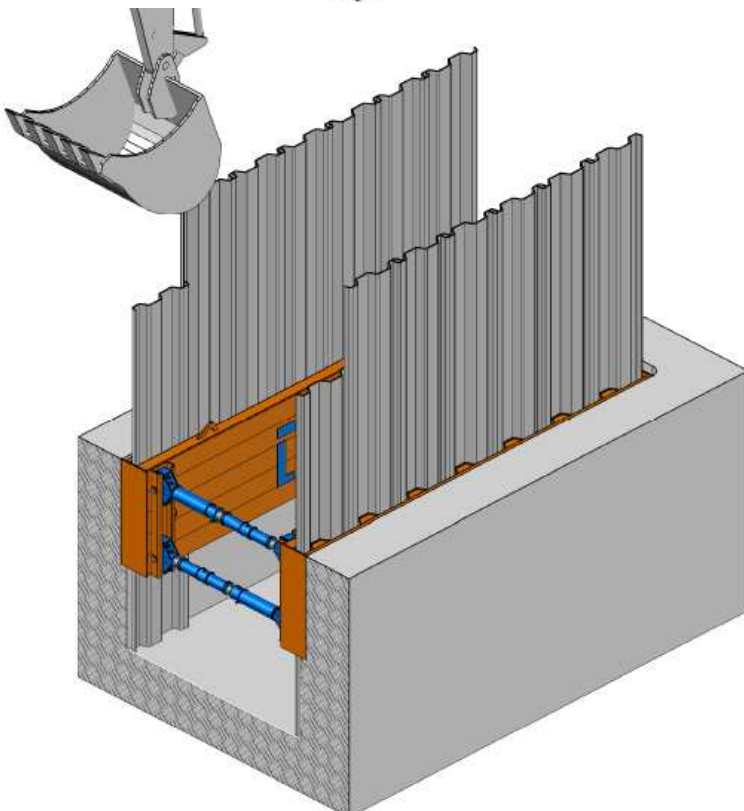


Pre-Excavation max. 1,00m and not more than the lengths of the Pile Guide Box. In principle the pre-excavation complies with the type of soil and the safety regulations.

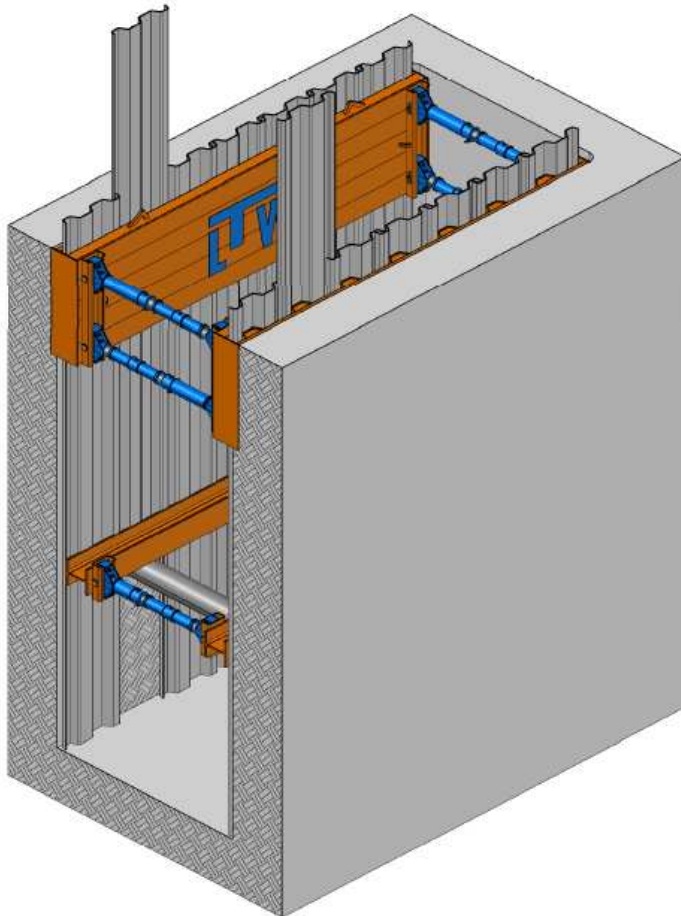
Connect the lifting hooks into all four lifting eyes of the plates. Place the completely assembled Pile Guide Box in the pre-excavated trench and align it. Observe the details regarding Box weights as per our technical data sheet.

Fill the gap between the trench walls and the inserted shoring unit and compact it.

Spindle out the Pile Guide Box against the trench walls. The gap between the trench walls and the inserted Pile Guide Box must be backfilled and compacted! .



Place the trench sheets into the guidance's between inner and outer plate and press-in using the excavator bucket. The guidance's in between the inner and outer plate will ensure, that the trench sheets are properly guided and kept. The lowering of the trench sheets is effected in turn with the excavation. The trench sheets have to be pressed in by the excavator bucket, or by means of vibration (and not "hammering" with the bucket). Excavate about further 0,5m and press in the trench sheets by turn. Repeat this procedure until reaching the required trench depths.



When service lines crossing the trench, the installation of the trench sheet concerned, is effected up to the summit of the crossing. Lock this trench sheet(s) against further sliding. Underneath the service line it has to be shored conventionally e.g. with timber.

Depending on soil conditions and depths and if buildings at risk of settlements are close to the excavation, wailers have to be provided and installed on site. These have to be chosen according to static requirements and must be checked upon every case of operation. The site specific engineering will report position and rating of the required wailer.

Re-Installation

After completion of the Pipe laying the re-installation of the trench sheets can be effected.

According to compacting possibilities bring in 0,5m filling material. Lift the trench sheets by the filled height and start compacting. Repeat this procedure as described until the trench sheets can be lifted out of the trench. Finally the Pile Guide Box can be lifted out; observe the safety regulations. Attach the lifting accessories at least at 2 lifting eyes of the particular plate. **It is not allowed to lift at the Struts!**

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