ASSEMBLY AND OPERATING MANUAL
LTW EG CORNER - MANHOLE

Manufacturer:	**LTW Tiefbauvertriebs GmbH**
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General Instructions

Intended Use

- For soil replacement on contaminated sites
- For installation of garbage container in city center areas
- Flush positioning of the next section/module
- Compatible with standard slide rail system

The continuous conversion of the modules is covering an entire area, without mixing contaminated excavation and backfill soil.

For this reason, this type of system can only be used as EG corner. Depending on local differences, different corner slide rails can be used. In combination with base and top panels a trench depths of ~ 4,00m can be achieved.

Slide Rail Systems are being installed using the lowering and cut method (“dig and push”).

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.

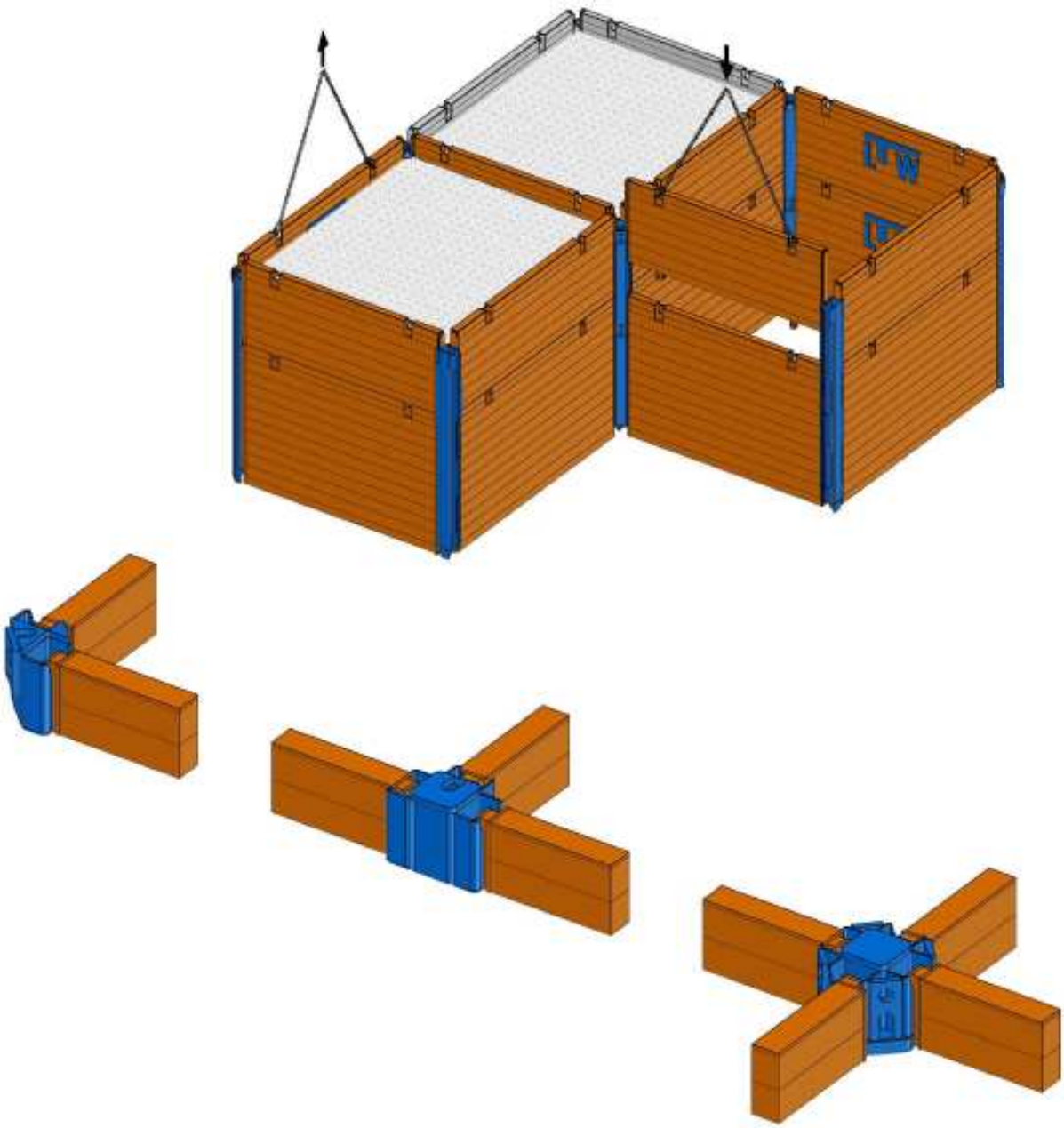
Faulty or deformed parts must be replaced in any case.

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.

System view

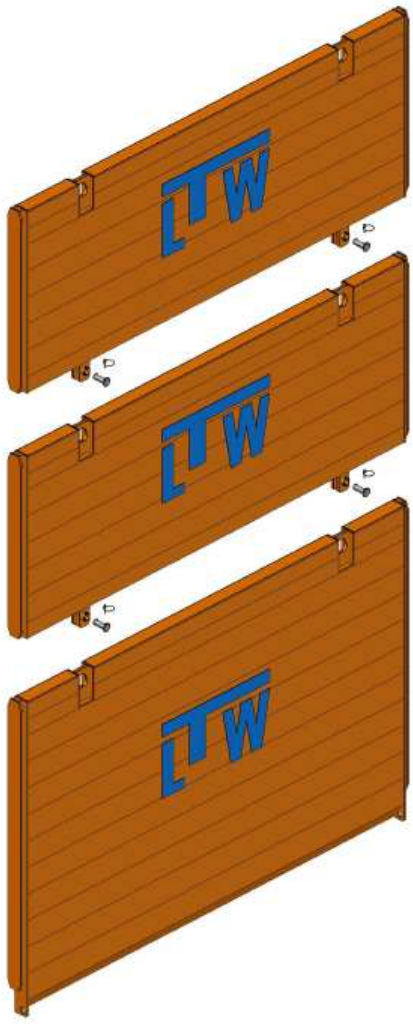


EG corner **EG corner 3-sided** **EG corner 4-sided**

Technical Characteristics

Plates VS 60

Plate length L [m]	Plate height H [m]	Plate thickness t_{Pl} [mm]	Working width b_C [m]	Limit state design load e_d [kN / m²]	Plate weight G_{PL} [kg]
2,00	*2,40*	*60*	*~2,21*	*77,9*	*365*
	1,32				*215*
	1,56				*250*
2,50	*2,40*	*60*	*~2,71*	*50,1*	*445*
	1,32				*260*
	1,56				*300*
3,00	*2,40*	*60*	*~3,13*	*36,8*	*510*
	1,32				*295*
	1,56				*345*



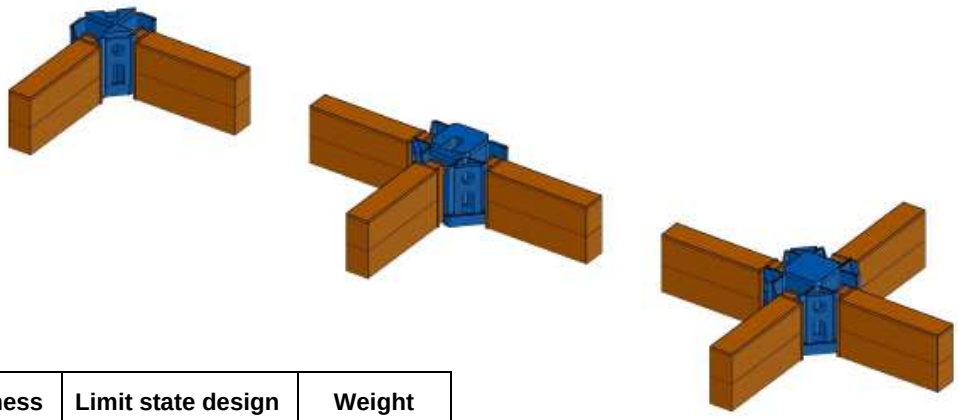
Plates VS 100

2,00	*2,40*	*100*	*~2,13*	*171,6*	*510*
	1,40				*335*
	1,60				*370*
2,50	*2,40*	*100*	*~2,63*	*110,4*	*605*
	1,40				*400*
	1,60				*440*
3,00	*2,40*	*100*	*~3,05*	*81,1*	*690*
	1,40				*450*
	1,60				*500*
3,50	*2,40*	*100*	*~3,63*	*56,6*	*805*
	1,40				*525*
	1,60				*580*

Plates VS 120

4,00	*2,40*	*120*	*~4,09*	*71,0*	*1170*
	1,40				*745*
	1,60				*835*
4,50	*2,40*	*120*	*~4,59*	*56,2*	*1305*
	1,40				*830*
	1,60				*930*
5,00	*2,40*	*120*	*~5,09*	*72,1*	*1635*
	1,40				*1020*
	1,60				*1150*

Corner slide rails



EG CORNER KT

Rail length [m]	Rail thickness t_{Tr} [mm]	Limit state design moment M_d [kNm]	Weight G_{Tr} [kg]
2,50	*183*	*113*	*175*
3,00			*200*
3,50			*230*
4,00			*255*

EG CORNER KT 3-sided

Rail length [m]	Rail thickness t_{Tr} [mm]	Limit state design moment M_d [kNm]	Weight G_{Tr} [kg]
2,50	*250*	*197*	*275*
3,00			*320*
3,50			*365*
4,00			*410*

EG CORNER KT 4-sided

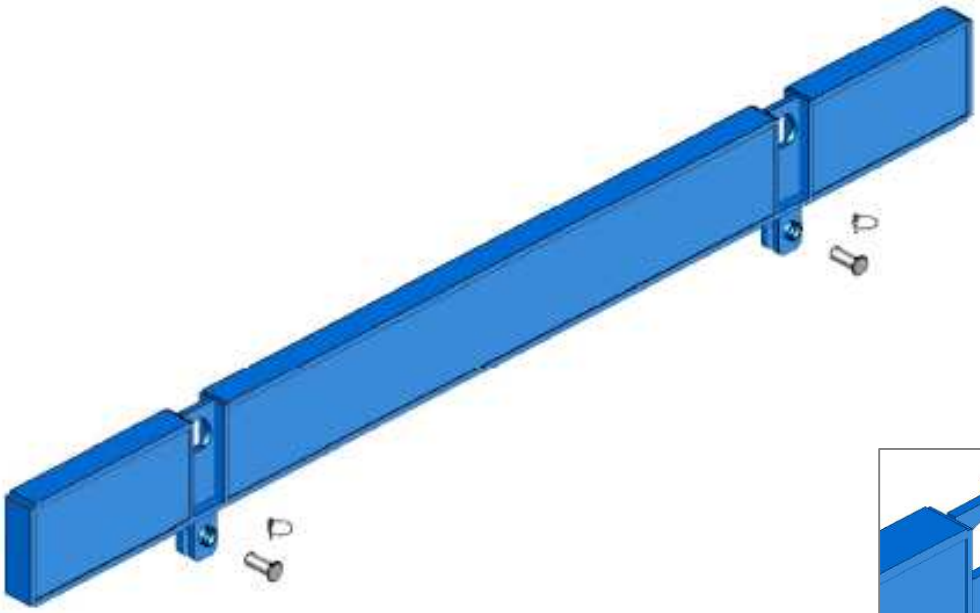
Rail length [m]	Rail thickness t_{Tr} [mm]	Limit state design moment M_d [kNm]	Weight G_{Tr} [kg]
2,50	*350*	*358*	*370*
3,00			*430*
3,50			*490*
4,00			*555*

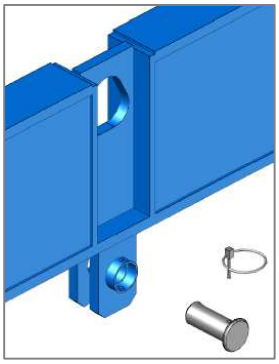
Accessories

Description	Dimension	specified use for	Weight [kg]
bolt	*∅40 * 128*	*connection between Base and Extension Plates*	*1,4*
locking clip [R]	*∅6*	*locking clip for connecting bolt at plates*	*0,1*
protection rail for VS 100 & 120			
protection rail	*L = 1800*	*for Plate length 2,00m*	*151*
protection rail	*L = 2300*	*for Plate length 2,50m*	*188*
protection rail	*L = 2500*	*for Plate length 3,00m*	*203*
protection rail	*L = 3300*	*for Plate length 3,50m*	*264*
protection rail	*L = 3800*	*for Plate length 4,00m*	*304*
protection rail	*L = 4300*	*for Plate length 4,50m*	*341*
protection rail	*L = 4800*	*for Plate length 5,00m*	*378*

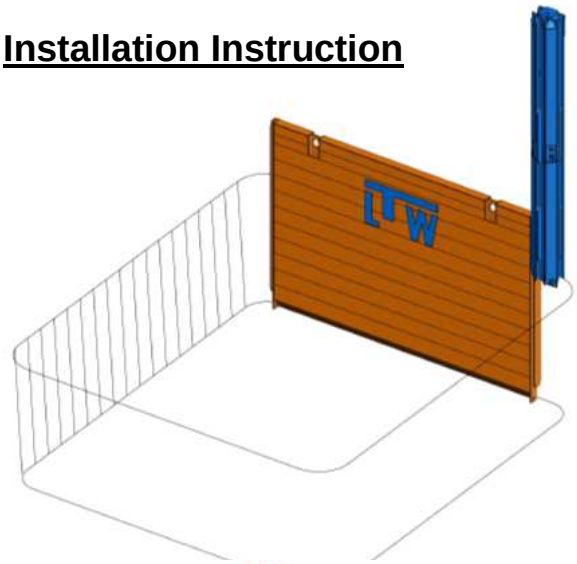
Tensile Forces

lifting eyes at the rail head **R_d = 226 kN**
lifting eyes at the plate head **R_d = 229 kN**
bottom eyes at the plate **R_d = 47 kN**

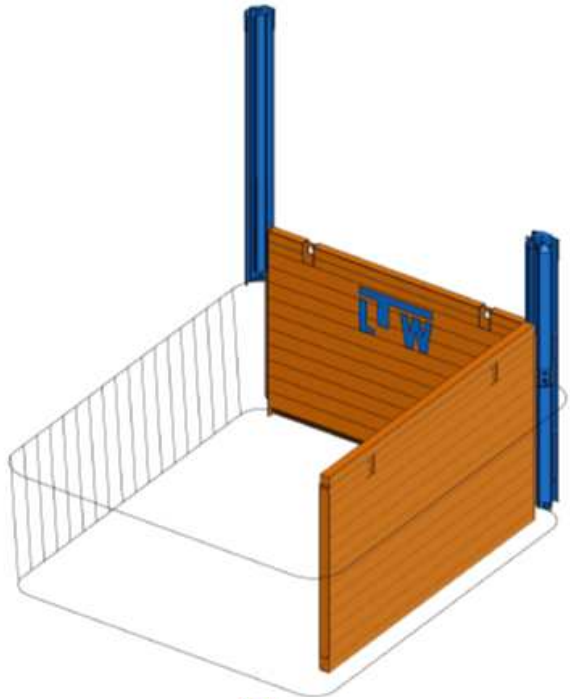




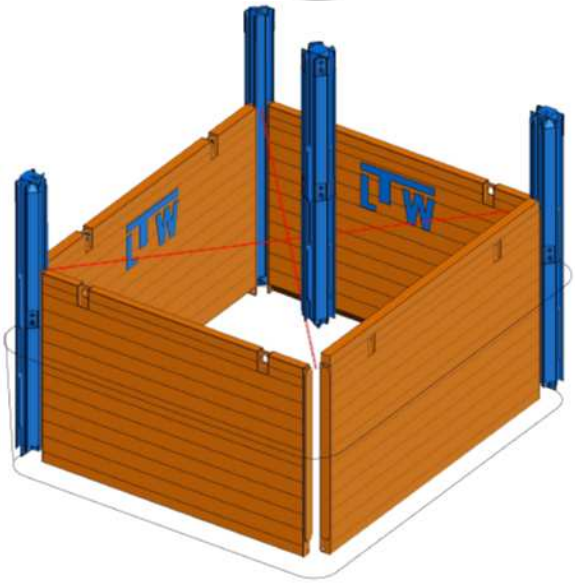
Installation Instruction



- Pre-Excavation of max. 1,25m and approx. 10cm wider than the pit will be. In principle the pre-excavation complies with the type of soil and safety regulations.
- Connect the lifting hooks to the first Base Panel, place it into the pre-excavated trench, push in and secure it.
- Pick up the 1. Corner Slide Rail with an appropriate lifting device, raise it over the Base panel and insert the guidance over the side part (T-Section) of the Panel. Press the Slide Rail Frame carefully into the ground.
- At this stage the trench must not be entered!

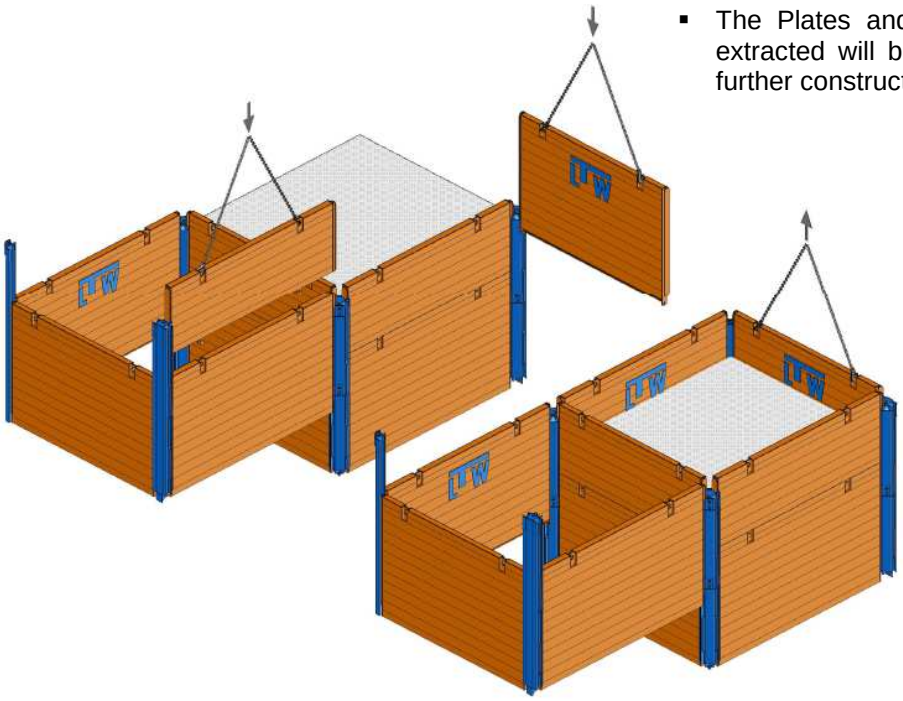


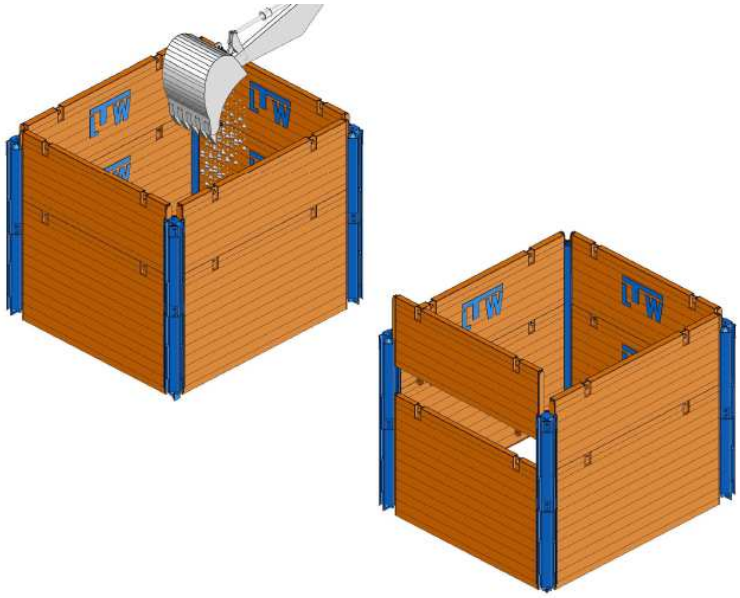
- Mount the second plate in the free guidance of the Corner Slide Rail and align rectangular.
- The second Corner Slide Rail is now guided with the guidance over the side part (T-Section) of the already installed Panel. The further installation is effected as described before, until all four Plates had been installed.



- The fourth Corner Slide Rail is now guided over the two free side parts (T-Sections) of the plates. The perfect distances between the two free side parts should be ~9cm.
- Pre-excavate about another 50cm and push in Rails and Plates by turn.
- Fill the gap between the trench walls and the inserted shoring!
- To protect the shoring plates and ensure a long life cycle we recommend the use of protection rails.
- When the top of the externally guided plate has reached the top ground surface, the system will be extended by using a top plate.
- Connect the Base and Extension Panels with the Connecting Bolts ∅ 40*128mm and the [R] locking clips.
- The step-by-step installation has to be continued, until the trench has reached the desired trench depth.
- The top edge of the shoring must overtop the surrounding terrain by at least 5cm!

- Depending on the requirements, triangular corner slide rails or quadrangular corner slide rails can be used.
- In this case this shoring area serves as shuttering for the newly established sector.
- The Plates and Rails which have already been extracted will be continuously installed within the further construction progress.





Re-Installation

According to compacting possibilities bring in 0,50m filling material. Start lifting the inner plates by the filled height. Finally compact the backfill.

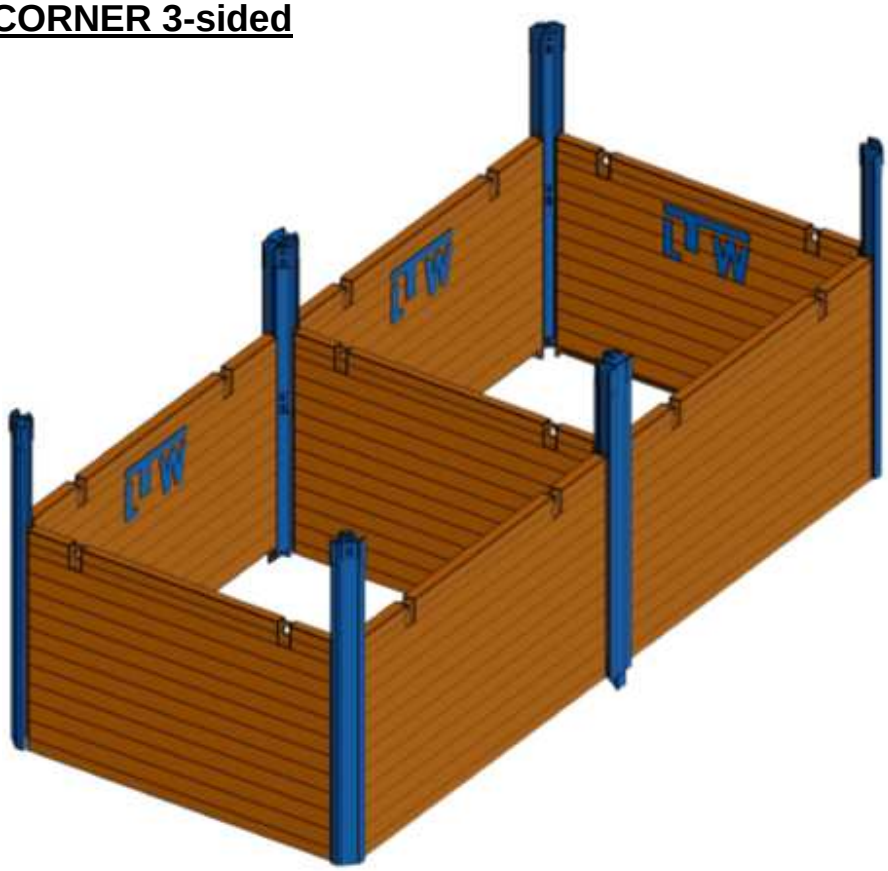
Repeat this procedure as described until the shoring can be lifted out of the trench.

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

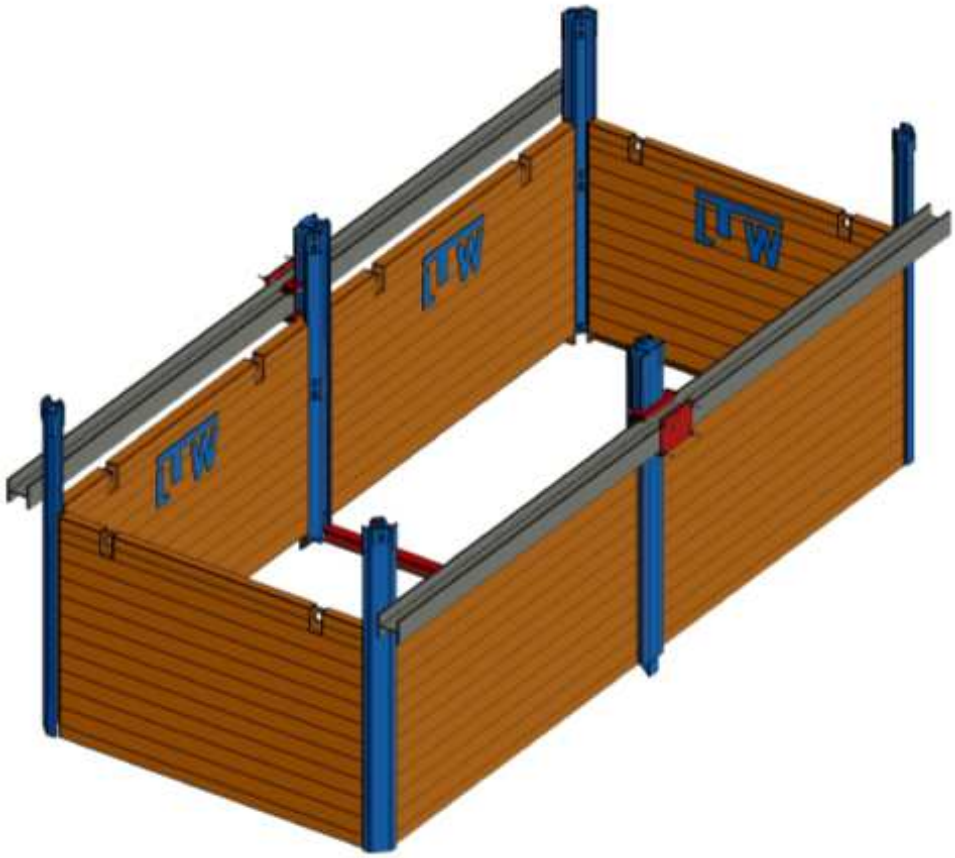
It is prohibited to stand within the pivoting range of the excavator or crane and beneath suspended loads.

Clamping device - EG CORNER 3-sided

2 Bay Pit



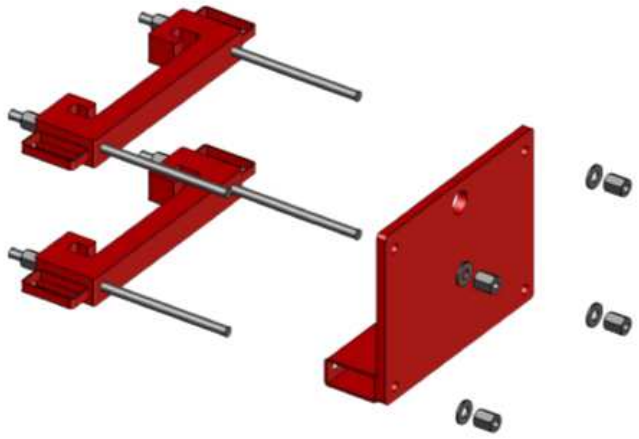
2 Bay Pit
with clamping device



Technical parameters

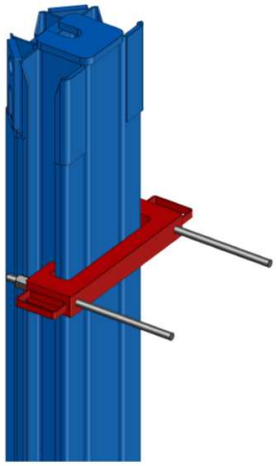
Clamping Device consisting of:

Description	Qty.	Weight [kg/pce.]
Socket	*2*	*19,5*
End Plate	*1*	*33,4*
threaded rod	*4*	*1,2*
hex-nut	*8*	*0,6*
washer	*8*	*0,1*
complete kid	***1***	***82***

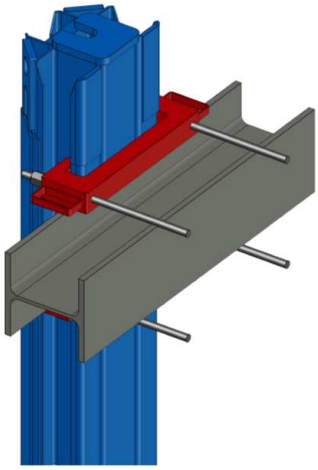


The clamping device engages behind the EG corner 3-sided and clamps the outside horizontal upper waler HEB 240. It creates a load-carrying connection which enables the forces that arise being discharged into the outer corner slide rails.

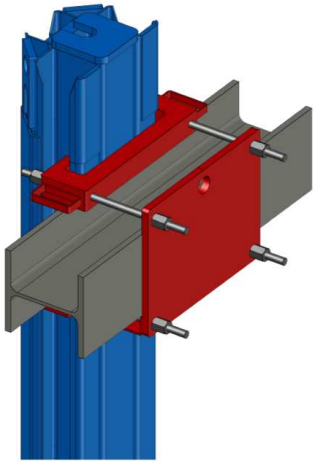
Installation Instruction



- Installation of the Bay Pit as described before. The Shoring plates must reach the top ground surface.
- The central corner slide rail must be braced in the trench bottom, (bottom support), e.g. by means of a HEB waler or a Concrete Slab. The dimensioning of the waler acts in accordance with the statical require-ments and the working width.



- Pre-assemble the sockets with the threaded rods, hex-nuts and washers. Move the first socket over the EG corner 3-sided and put down on the top ground surface.
- Put the waler HEB 240 behind the Slide Rails on approx. 6cm thick wood pieces.



- Move the second pre-assembled socket over the EG corner 3-sided and put down on the top of the waler.
- Take the end plate and fix it to the threaded rods, and fasten the bolts securely with nuts and washer.
- **Now the panels across the clamping device can be removed.**