OPERATING MANUAL

Standard Box with Transformation Profile Series 600

manufacturer: **SBH Tiefbautechnik GmbH**
Ferdinand-Porsche-Str. 8
D – 52525 HEINSBERG

phone: +49 (0) 24 52 / 91 04 0
fax: +49 (0) 24 52 / 91 04 50
E-mail: info@sbh-tiefbautechnik.com
Homepage: http:\ \ www.sbh-tiefbautechnik.com

Contents

General instructions

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 sections (boxes) may only be used if the front and rear faces are properly secured.

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

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

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

During installation the instructions of this operating manual have to be followed.

Lifting & Transporting

- The shoring may only be attached at the corresponding eyes and openings and/or lifting accessories.
- The lifting accessories must be adapted to the weight which must be transported.
- For safety reasons only load hooks with hook safety must be used.
- The allowed tensile forces have to be kept in any case.
- The transporting has to be carried out next to the soil and unneeded pendulum movements have to be avoided.
- It is forbidden to enter the swivel range of the lifting tool and to stay under floating loads.
- It has to be paid attention to overhead contact lines.
- Engine driver and instructor must have face-to-face interaction.

Measures to reduce danger

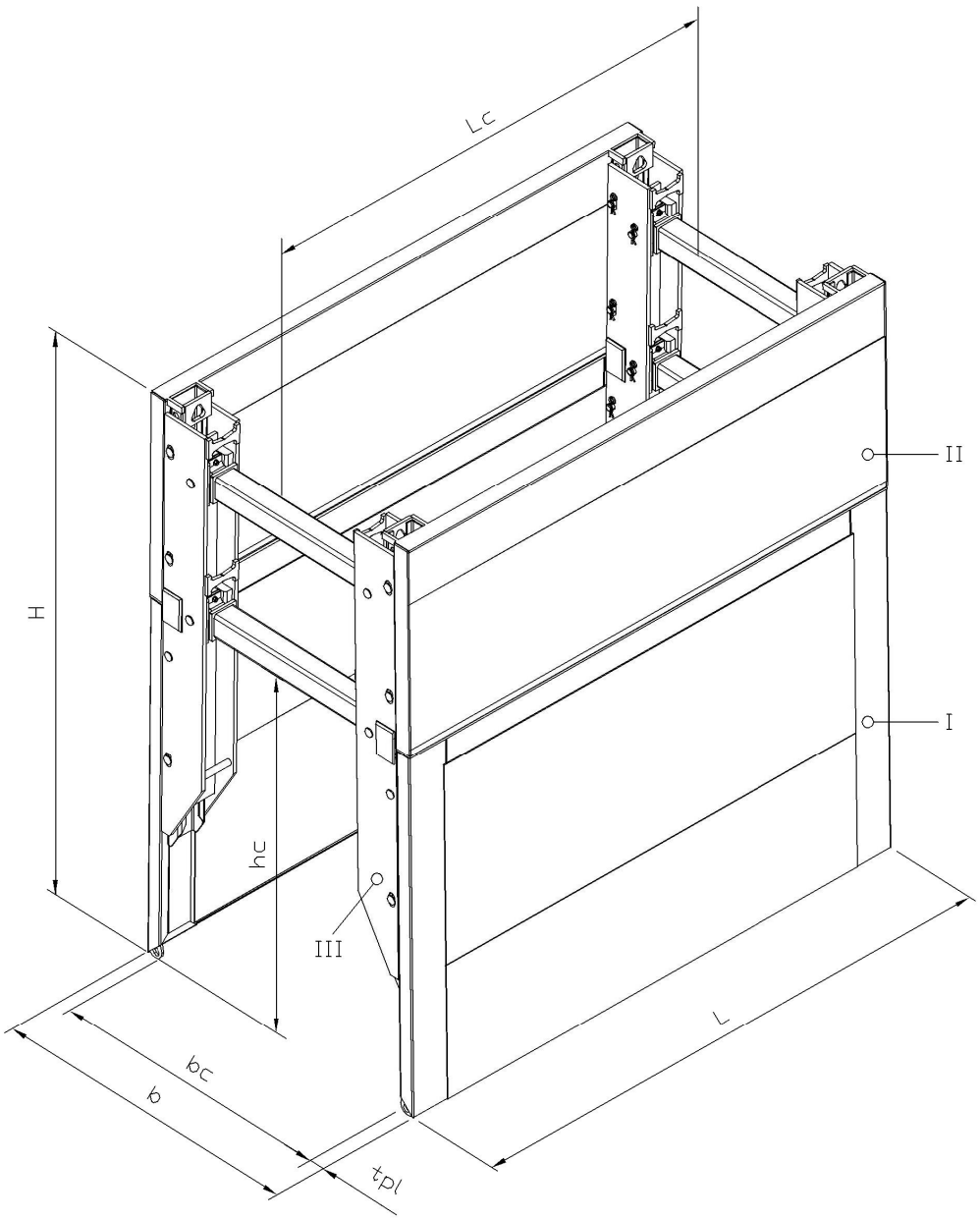
- The construction site has to be sufficiently secured and marked.
- Neighbouring traffic flow has to be made possible by means of security personnel if needed.
- The personnel must wear protective clothing (helmet / safety shoes / gloves).
- Possible instabilities as a result of wind loads, during the assembly and installation, must be considered.
- The shoring components must be layed down – preferably in horizontal way – on a firm underground.
- In case of slopes it has to focus on a stable storage or mounting of pre-assembled components.

Maintenance & repair

- As a matter of principle, the operability of all shoring components must be checked before use.
- Defective or deformed components may not be used in any case.
- Slighter damages may be repaired by yourselves after consulting SBH. Otherwise, our service at SBH is at your disposal if desired.
- Only original spare parts of SBH may be used.
- According to intenseness of use, the components should be painted with anti-corrosive paint every 2 years.

System drawing

Transformation profile



I	base plate	b	trench width	h_C	spindle clearance height
II	top plate	b_C	working width	L	plate length
III	transformation profile	t_{Pl}	plate thickness	L_C	spindle clearance length

Technical Parameters

Transformation profile

allowed moment = 152,5 kNm

Plate thickness = 107 mm

allowed plate moment = 79,1 kNm/m
allowed side part moment = 211 kNm

length L [m]	clearance length L_C [m]	height H [m]	clearance height h_C [m]	working width betw. plates b_C [m]	working width betw. profiles b_C [m]	all. earth pressure e [kN/m²]	max. deflection f [mm]	weight box b_C = 2,33m [kg]
3,00	*2,60*	*2,4 + 1,4* *2,6 + 1,4*	***2,30*** ***2,51***	*2,33*	*1,72* *1,97*	*57,0* *47,6*	*28* *30*	*5220* *5350*
3,50	*3,10*	*2,4 + 1,4* *2,6 + 1,4*	***2,30*** ***2,51***	*2,33*	*1,72* *1,97*	*48,9* *40,8*	*34* *35*	*5590* *5730*
4,00	*3,60*	*2,4 + 1,4* *2,6 + 1,4*	***2,30*** ***2,51***	*2,33*	*1,72* *1,97*	*42,8* *35,7*	*42* *41*	*5960* *6120*

Plate thickness = 127 mm

allowed plate moment = 100,2 kNm/m
allowed side part moment = 211 kNm

length L [m]	clearance length L_C [m]	height H [m]	clearance height h_C [m]	working width betw. plates b_C [m]	working width betw. profiles b_C [m]	all. earth pressure e [kN/m²]	max. deflection f [mm]	weight box b_C = 2,33m [kg]
4,50	*4,10*	*2,4 + 1,4* *2,6 + 1,4*	***2,30*** ***2,51***	*2,33*	*1,72* *1,97*	*38,0* *31,8*	*42* *41*	*6850* *7040*
5,00	*4,60*	*2,4 + 1,4* *2,6 + 1,4*	***2,30*** ***2,51***	*2,33*	*1,72* *1,97*	*34,2* *28,6*	*50* *48*	*7280* *7480*
5,50	*5,10*	*2,4 + 1,4* *2,6 + 1,4*	***2,30*** ***2,51***	*2,33*	*1,72* *1,97*	*29,4* *26,0*	*59* *57*	*7700* *7920*
6,00	*5,60*	*2,4 + 1,4* *2,6 + 1,4*	***2,30*** ***2,51***	*2,33*	*1,72* *1,97*	*24,5* *23,8*	*67* *68*	*8120* *8360*

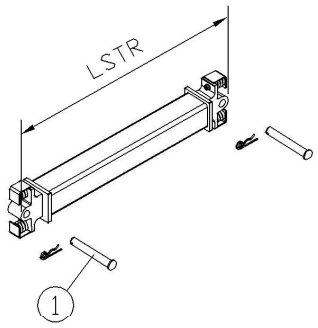
working width

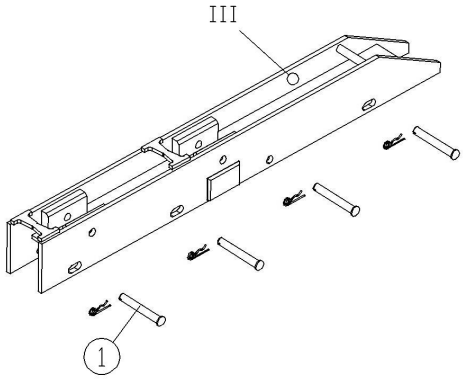
working width between plates = strut length + 0,33m
working width between transformation profiles = strut length - 0,28m

Strut 150*150*12

allowed moment = 1,7 kNm
allowed tensile force = 383 kN

strut length LSTR [m]	working width between plates [m]	working width between profiles [m]	allowed compressive force [kN]	weight [kg]
2,00	2,33	1,72	600	129
2,50	2,83	2,22	600	153
3,00	3,33	2,72	600	176
3,50	3,83	3,22	550	200
4,00	4,33	3,72	500	223
4,50	4,83	4,22	450	247
5,00	5,33	4,72	400	270
5,50	5,83	5,22	350	294
6,00	6,33	5,72	300	317



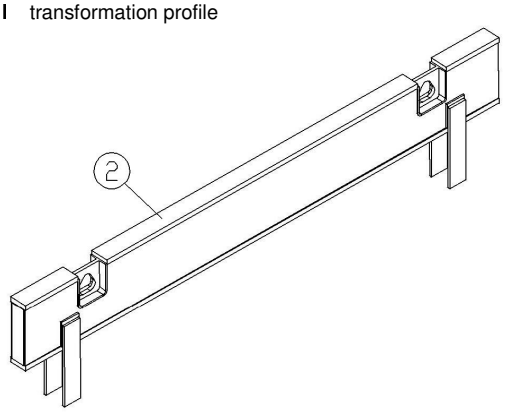


III transformation profile

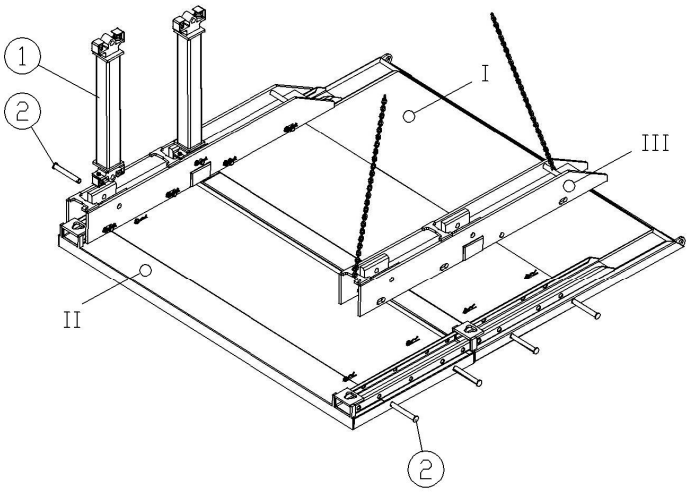
Accessories

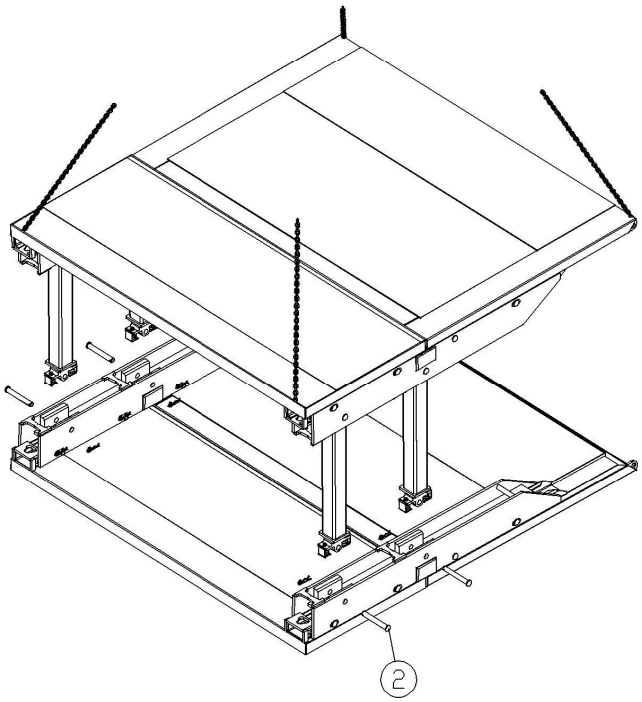
No.	description	use for	dimensions [mm]	weight [kg]
1	pin with clip 6,3	transformation profile and spring spindle holder	ø40 * 290	3,0

2	protection rail	plates t = 107	L = 2730 L = 3300 L = 3510 L = 3800	321 379 399 430
		plates t = 127	L = 4800 L = 5300 L = 5800	646 703 760



Assembly instructions





Put the base and top plates to one other onto a flat and firm underground with the profiles to the top.

Afterwards put the transformation profile over the profiles and fix with two pins Ø40*290mm each in base and top plate and secure by means of the clips.

Put the spring spindle holders of the yellow strut in the upper and of the blue strut in the hole below of the transformation profile, fix with the pins Ø40*290mm and secure by means of the clips.

After mounting all struts, this plate is connected to the corresponding lifting/transportation eyes at the top and cutting edge and then put from the top onto a plate beneath which is mounted with transformation profiles and then bolted and secured.

The required A-position is already given by the slightly longer blue strut, which is fixed in the hole below.

I base plate
II top plate
III transform. profile

1 strut
2 pin Ø40*290

Installation instructions

Allowed tensile forces

At the single attachment points the following tensile forces can be beared:

SHORING PLATE	per lifting eye at the top	= 153 kN
	per eye at cutting edge	= 49 kN
TRANSFORMATION PROFILE	per lifting eye at the top	= 153 kN

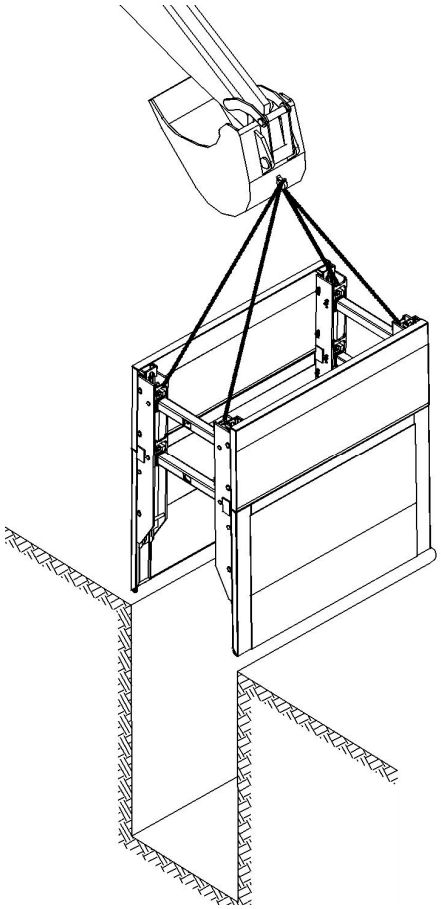
Place and adjust method

The shoring box is placed in the totally pre-excavated trench.

The place and adjust method is allowed only if the following requirements are given:

- Temporary steady soil
- Outside of the sphere of buildings or structural plants
- Outside of the sphere of circulation spaces and endangered lines
- Settlements can be accepted

A soil is charaterised as temporary steady if it does not have considerable collapses in the time between start of excavation and placing of the shoring.



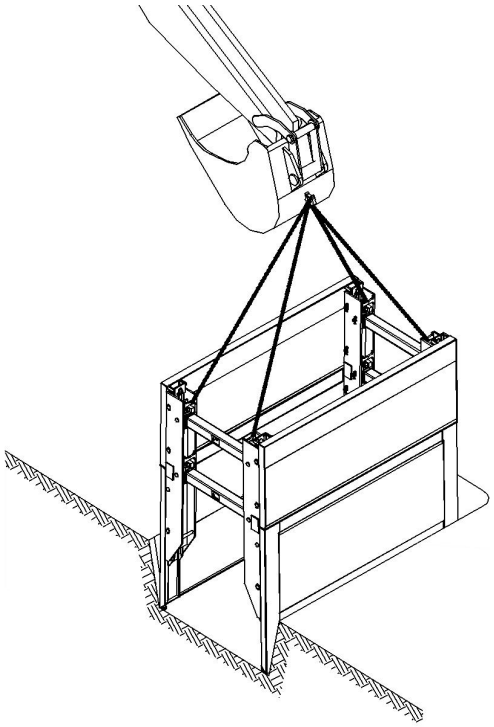
Attach the chains to the four eyes at the transformation profile and place the completely assembled box by means of lifting tools and appropriate lifting accessories in the entirely pre-excavated trench.

The excavation length has to be limited to the box length.

The opening between shoring and soil has to be filled and compacted!

Cut and lower method

In unsteady soils, the shoring has to be installed by alternately pushing in and lowering.



Pre-excavation max. 1,25 m and not more than one shoring section length. In principle the pre-excavation complies with the type of soil and safety regulations.

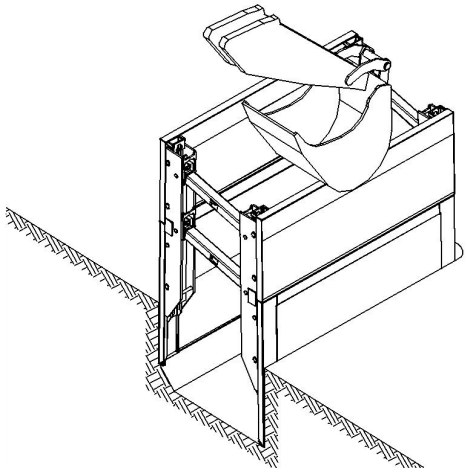
Attach the chains to the four eyes at the transformation profile and place the shoring box into the pre-excavated trench, align and push in.

Fill the opening between shoring and soil and compact!

The shoring plates are to be pushed in and not battered. For safety reasons it is not allowed to push the extension pipes.

In this phase the trench may not be entered.

Excavate about further 0,50 m and alternately push in the plates.

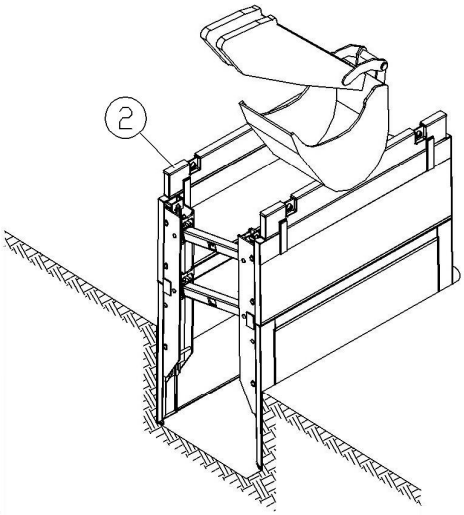


The smaller the Stepps or pushes are carried out the better for the shoring! Do not push more than 0,50 cm the one side and limit the swivelling angle of the spindles to +/-8°.

Repeat this procedure until reaching the required trench depth.

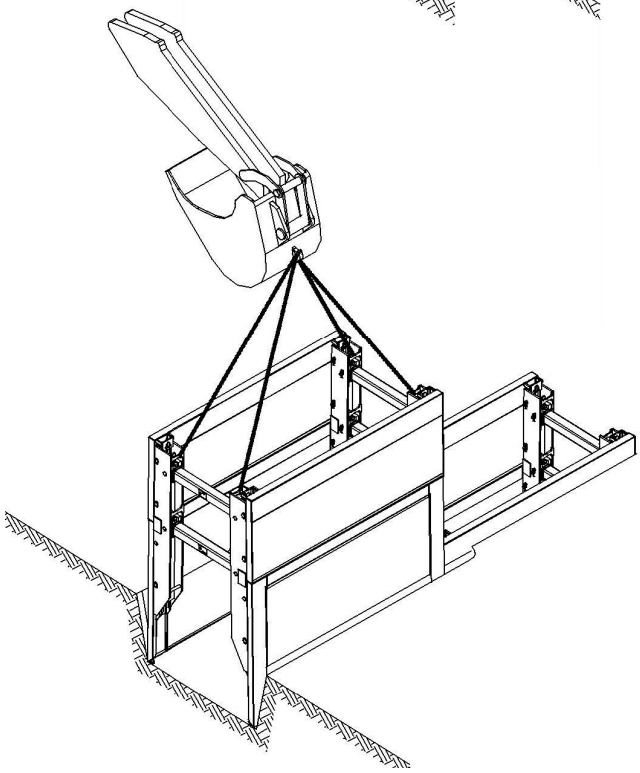
The top edge of the shoring must overlap the surrounding site by at least 5 cm!

Use of protection rails



To protect the shoring plates and ensure long life cycle we recommend the use of protection rails.

7 protection rail



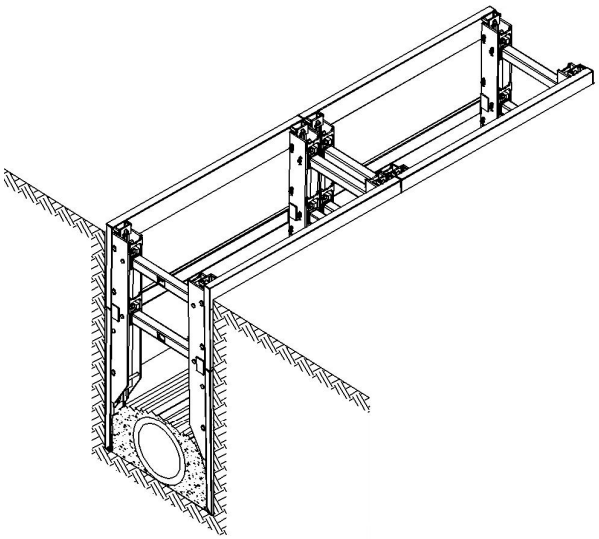
Installation of further shoring sections

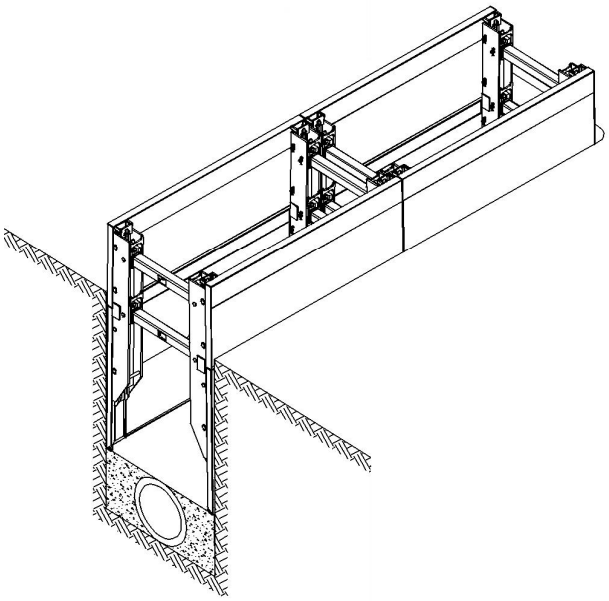
Once the foregoing shoring section is installed to full depth, it can be started with the next shoring section.

The installation is effected analogously as described before.

After the installation of the shoring boxes, the pipe laying can be started in the shored and secured trench.

Re-installation





After completion of the pipe laying the re-installation of the shoring is effected.

According to compacting possibilities bring in about 0,50 m filling material. Lift the shoring box by the filled height. That followed the compaction of the filling materia.

The smaller the lifting steps the better for the shoring! Do not lift more than 0,50 cm to one side and limit the swivelling angle to +/-8° beschränken.

Repeat this procedure as described until the shoring can be lifted out of the trench according to the safety regulations.

Preferably use the eyes at the top plates to lift the shoring box. Thereby, first the top plates loosen from the trench wall and facilitate the lifting. It is not allowed to lift at the extension pipes!

We advise specifically that it is forbidden to enter the danger zone during the installation and re-installation.

In order to avoid an overstraining of the shoring plates, do not lift onesided. Attach lifting accessories at least at 2 eyes of the particular plate.