OPERATING MANUAL

LIGHT WEIGHT BOX Series 100

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

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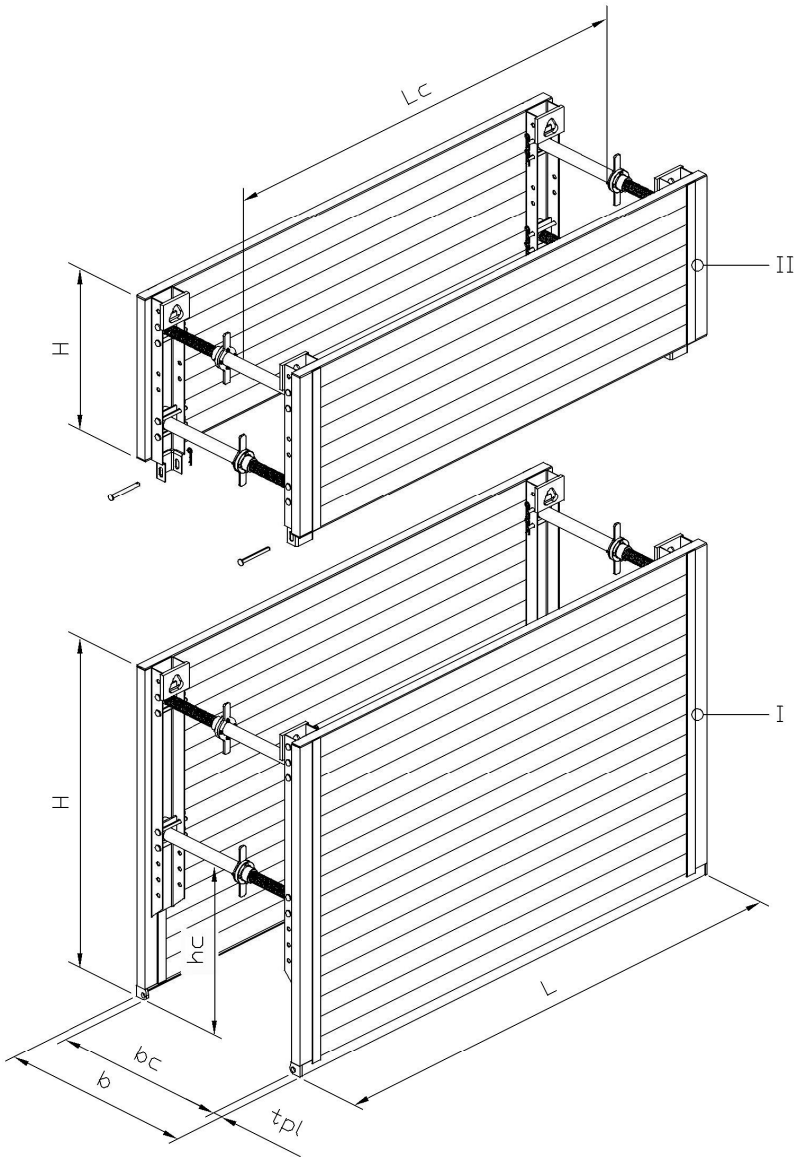
System drawing



I	base box	b	trench width	h_C	strut clearance height
II	top box	b_C	working width	L	plate length
H	plate height	t_{Pl}	plate thickness	L_C	strut clearance length

Technical parameters

plates t_{Pl} = 60 mm allowed plate moment = 20,2 kNm/m all. side part moment = 12,3 kNm

plate length L [m]	plate height H [m]	clearance length L_C [m]	clearance height h_C [m]	allowed earth pressure [kN / m²]	weight/box with strut B [kg]
2,00	1,60	1,60	0,94	27,7	570
	2,00				670
	2,40				770
	2,60				830
	0,60				275
	1,40				510
2,50	1,60	2,10	0,94	22,1	655
	2,00				770
	2,40				890
	2,60				965
	0,60				315
	1,40				585
3,00	1,60	2,60	0,94	18,5	745
	2,00				875
	2,40				1010
	2,60				1095
	0,60				355
	1,40				660
3,50	1,60	3,10	0,94	15,3	830
	2,00				980
	2,40				1130
	2,60				1230
	0,60				395
	1,40				730

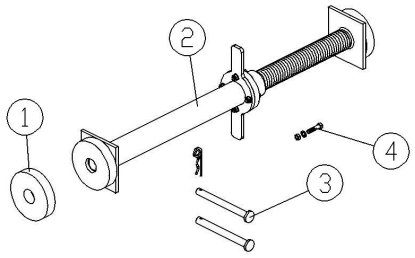
Strut

allowed tensile force = 32 kN

strut type	working width b_c min. [m]	working width b_c max. [m]	trench width b min. [m]	trench width b max. [m]	allowed compressive force [kN]	weight total [kg]
A	*0,53*	*0,73*	*0,66*	*0,86*	*160*	*14,2*
B	*0,71*	*1,07*	*0,84*	*1,20*	*147*	*16,9*
C	*1,05*	*1,65*	*1,18*	*1,78*	*124*	*20,9*
D	*1,50*	*2,10*	*1,63*	*2,23*	*107*	*23,6*
E	*1,88*	*2,48*	*2,01*	*2,61*	*92*	*25,8*
F	*2,48*	*3,08*	*2,61*	*3,21*	*69*	*29,3*

Accessories

no	description	use for	dimensions [mm]	weight [kg]
1	*rubber buffer*	*strut*	⬢ *150 * 30*	*0,43*
2	*strut*	*plates*		
3	*pin with clip 4*	*strut & connector*	⬢ *20 * 212*	*0,70*
4	*screw with nut & spring ring*	*strut*	*M10 * 45*	*0,05*



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

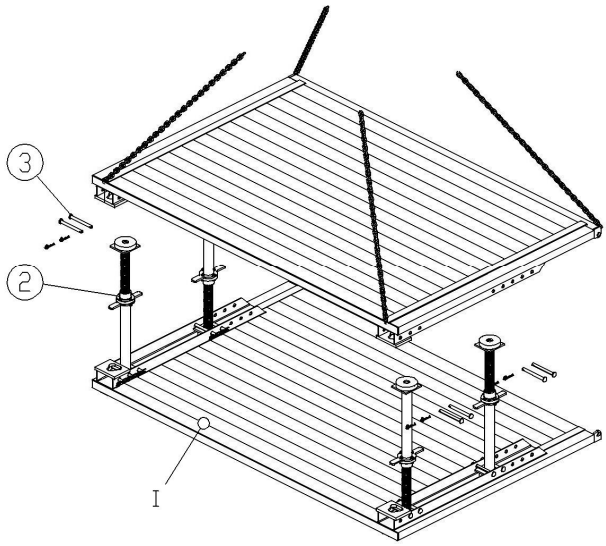
- The construction site has to be sufficiently secured and marked.
- Neighbouring traffic flow has to be made possible by means of security personnel if needed.
- The personnel must wear protective clothing (helmet / safety shoes / gloves).
- Possible instabilities as a result of wind loads, during the 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.

Assembly instructions

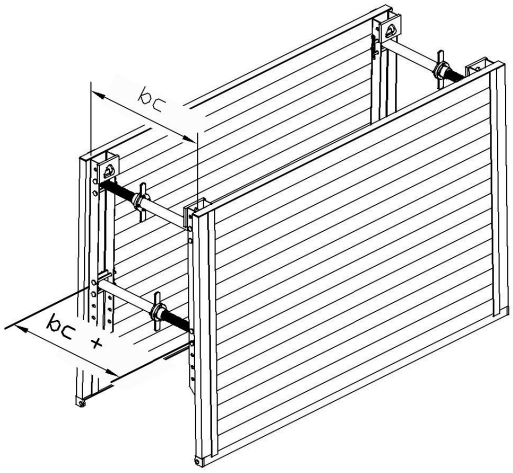


I base plate
2 strut
3 pin ⬣20*212

Put the base plates onto a flat and firm underground with the profile to the top.

Afterwards put the struts (with the thread respectively staggered down and accordingly upwards) into the profiles and fix with 2 pins ⬣20*212mm and secure by means of the clips.

After mounting all struts, the second plate is connected to the corresponding lifting/transporting eyes at the top and at the cutting edge and then put from the top onto the struts of of the plate beneath, pinned and secured.



Now the struts are extended to the required trench width. (fine adjustment)

Thereby it has to be paid attention that the bottom strut is extended by about 3 – 5 cm more than the upper one, in order to achieve the A-position of the shoring plates.

The shoring width must be shorter above and more wide below.

The assembly of the top boxes is effected analogously.

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

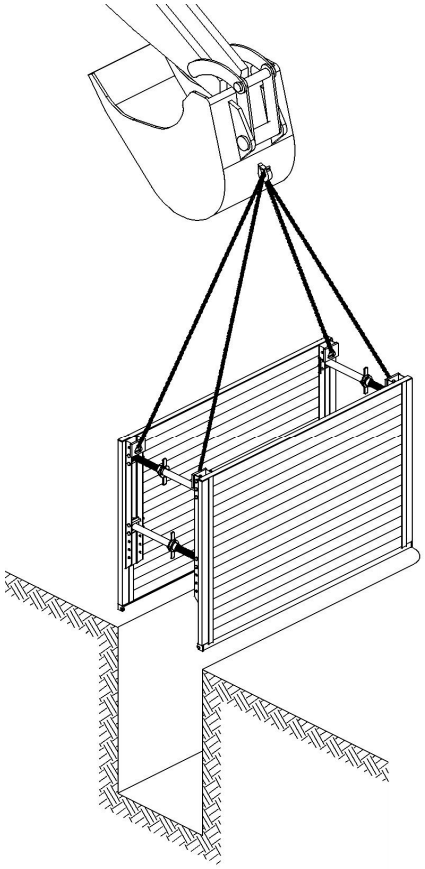
Place and adjust method

The shoring box is placed into 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 characterised as temporary steady if it does not have considerable collapses in the time between start of excavation and placing of the shoring.



For trench depths greater than the base plate height, when applying the place and adjust method, base and top boxes must be assembled outside of the trench and placed into the trench as a whole.

Base and top boxes are connected by means of the connectors and pins and secured with clips.

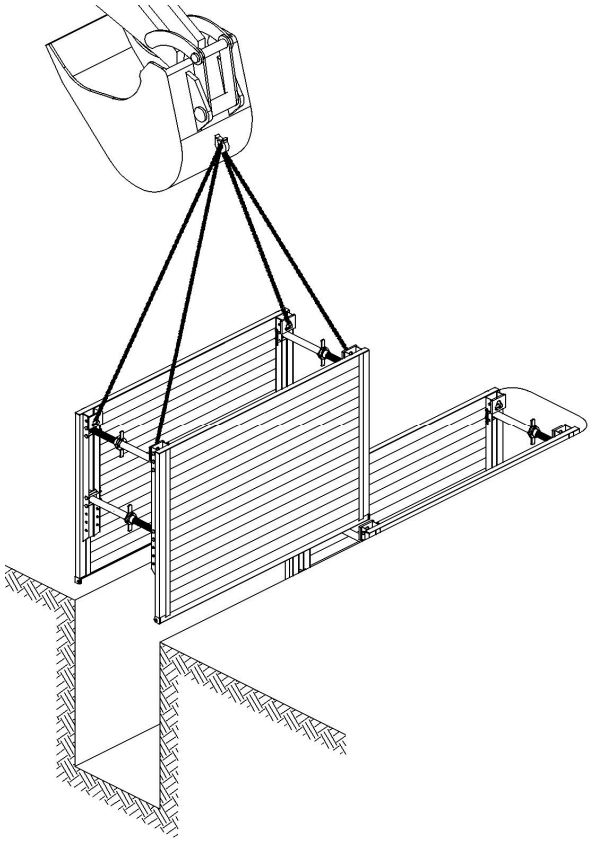
Attach the chains to the provided eyes in the profile at least at four points.

Place the completely assembled base and top box as a whole into the entirely pre-excavated trench by means of lifting tools and appropriate lifting accessories.

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

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

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



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 0,50m filling material. Lift the shoring box by the filled height. That followed the compaction of the filling material.

The smaller the lifting steps the better for the shoring! Do not lift more than 0,50 cm.

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

Only use the corresponding eyes for the lifting. It is not allowed to lift at the struts!

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.