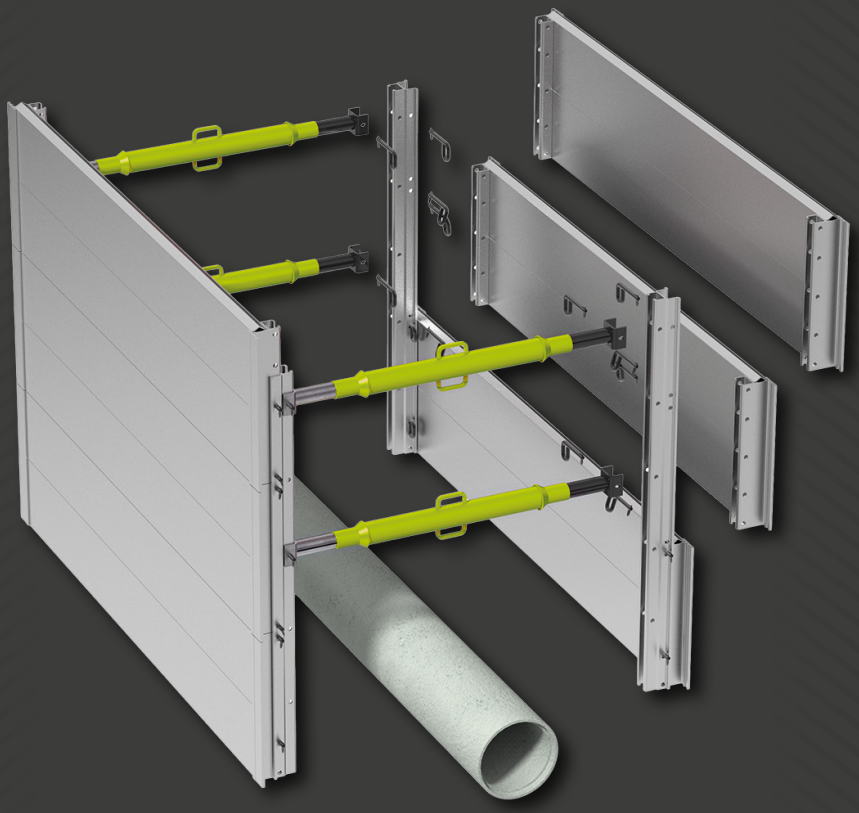
CONDOR



ISCHEBECK

LITEBOX

ALUMINIUM TRENCHING SYSTEM

One system - many uses. Lightweight. Efficient. Safe.

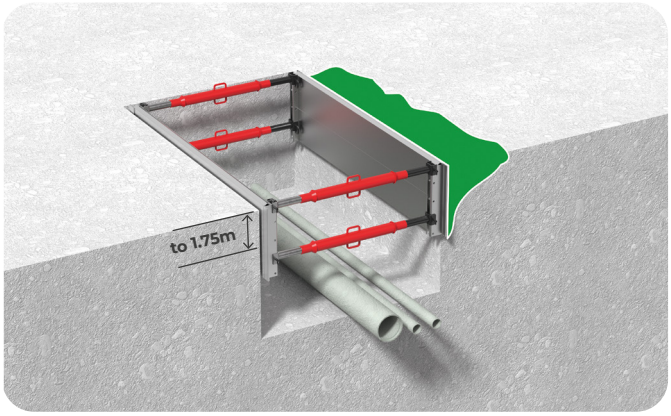
The LITEBOX aluminium trenwching system is the ideal shoring system for trenches as deep as 6 m and and is ideal for inner city applications. This aluminium modular system closes the gap between the frequently heavy and cumbersome steel systems and manu- al trench timbering.

The range is divided into five types of application to match the different requirements of building sites. This modular system can be combined and supplemented as required.

The many applications include the laying of cables and gas and water pipes in open trenches, jacking and working pits for installing pipes and cables underground, installing and repairing service connections to buildings, inspection work, horticultural and landscaping works, etc.

The LITEBOX aluminium trenching system complies with the requirements of DIN 4124 and DIN EN 13331. The safety aspects of the LITEBOX aluminium trenching system have been checked by DGUV test - testing and certification bodies of the German Social Accident Insurance (DGUV).

LITEBOX ALUMINIUM TRENCH EDGE SUPPORT

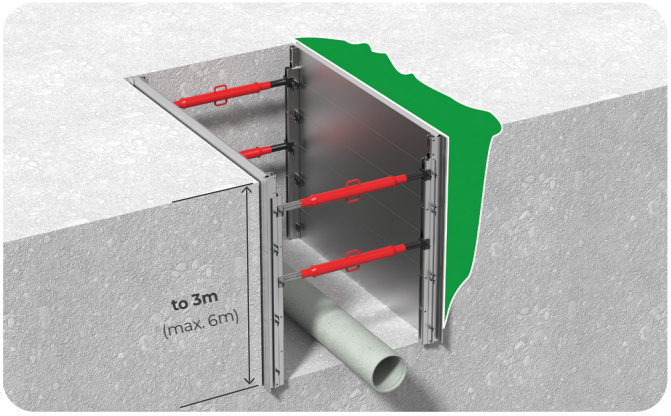


Partial shoring - for securing max. 1.75 m deep trenches.

- Prevents the top edges of the trench from collapsing.
- Suitable for stiff and cohesive soils as well as rocky ground.
- Can be installed by two persons without plant.

Trench Box A | Page 5

LITEBOX ALUMINIUM TRENCHING SYSTEM

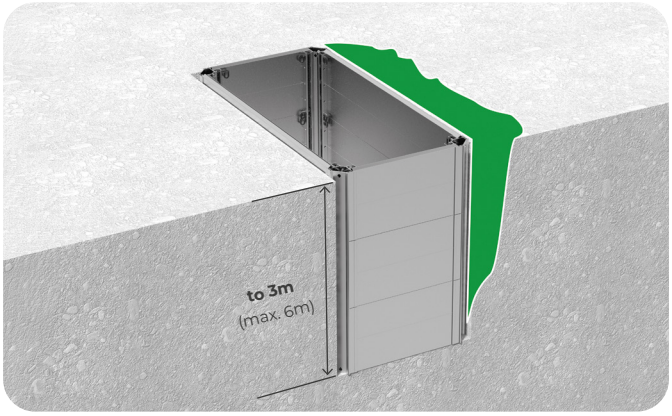


Full shoring - fast and safe, for max. 6 m deep trenches. *(trench depth > 3m only with panels <2m)*

- Sides fully supported.
- For soils that are stable for short periods.
- Suitable for use in max. 6 m deep trenches.

Trench Box B to K | Page 6-7

LITEBOX ALUMINIUM MANHOLE SHORING SYSTEM

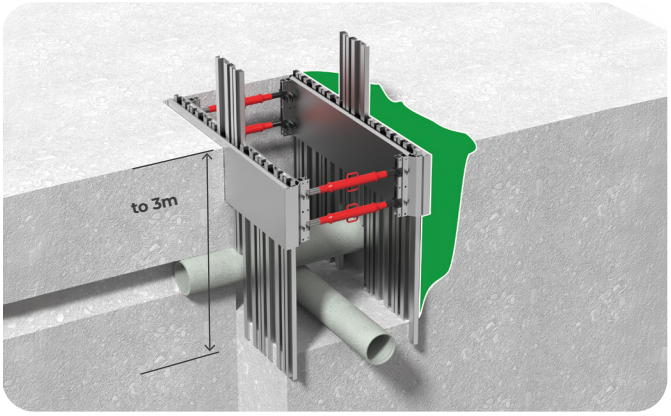


Aluminium manhole shoring - fast and safe, for max. 6 m deep shafts *(trench depth > 3m only with panels < 2m)*

- Sides fully supported.
- For soils that are stable for short periods.
- The solution for jacking and working pits.
- Suitable for supporting trench ends.

Manhole Boxes | Page 8-9

LITEBOX ALUMINIUM TRENCH SHEETING SYSTEM

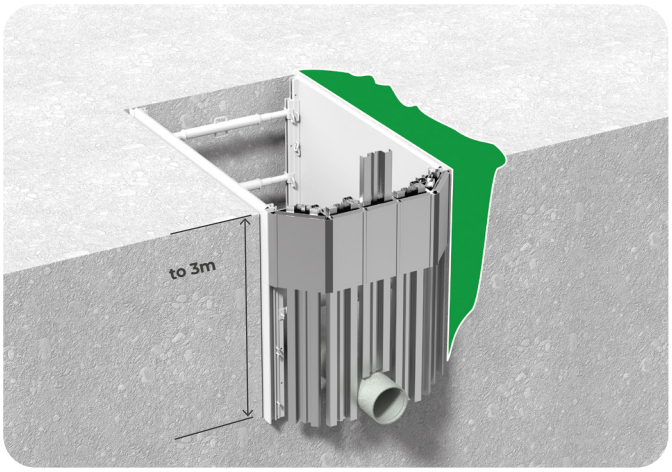


Full shoring with flexible and adjustable aluminium trench sheets - for max. 3 m deep trenches, also in complex situations.

- Easy to leave openings for crossing services.
- Also suitable for friable and cohesionless soils.
- Unobstructed view of trench sheets during installation.
- Safe excavation between supported sides.
- Generous pipe clearance height.

Strongframe Box | Page 10-11

LITEBOX ALUMINIUM END-FACE SHORING

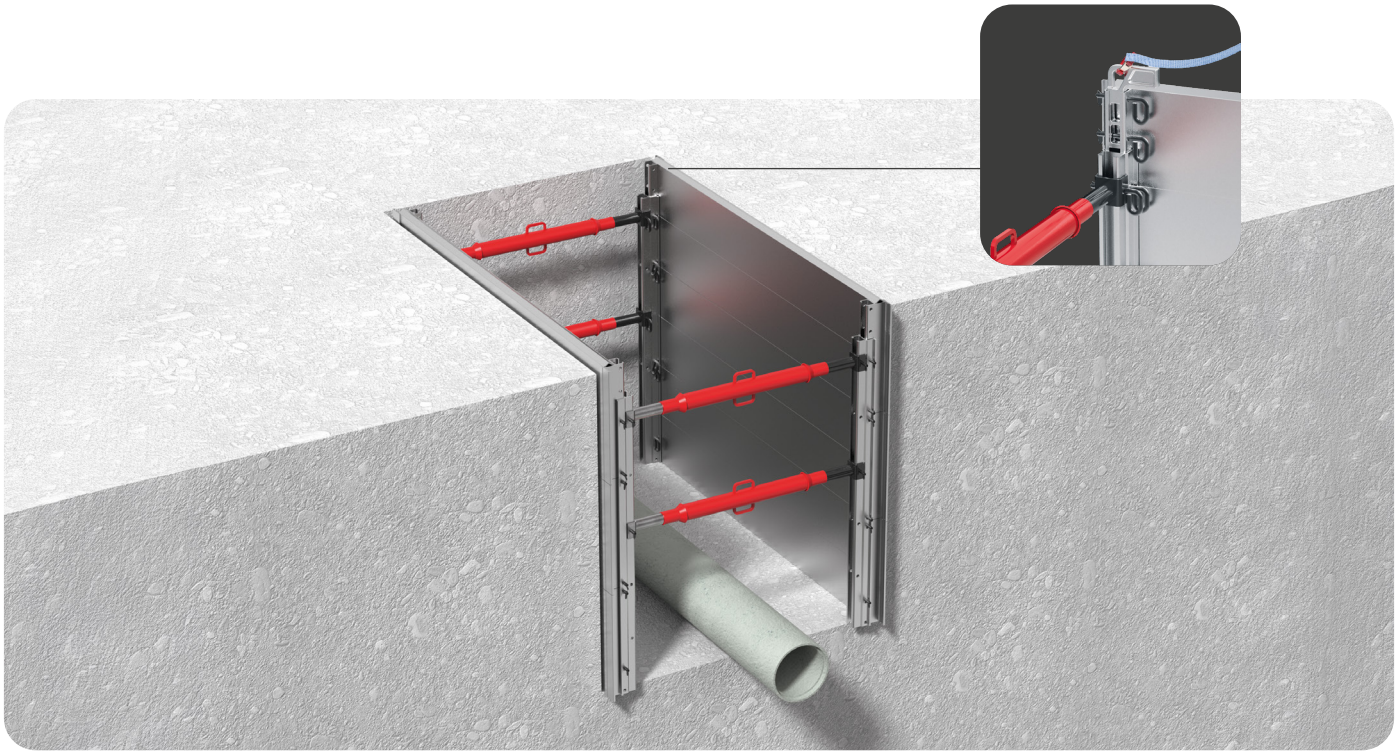


For securing the end faces of a trench against collapse. Can be combined with LITEBOX aluminium trenching and trench sheeting systems. Suitable for use in max. 3 m deep trenches.

- Modular system solutions easily adapted to different trench widths.
- Suitable for the complete extension range of Gi-A trench struts.
- Adapts to the edge of the trench, no unnecessary excavation required.

End-face Shoring | Page 12-13

LITEBOX ALUMINIUM TRENCHING SYSTEM INSTALLATION



Just a Few Basic Parts for Many Solutions

Using just a few basic parts it is possible to provide solutions for all customary trench widths and depths (max. 6 m) and awkward situations (crossing services, friable soils, cramped sites). Pipe clearance heights of up to 2.50 m simplify installation work.

Lightweight Parts for Easy Handling and Transport

The heaviest individual part of a LITEBOX aluminium trench box weighs 42 kg. A small van or even a trailer hitched up to a car is suffici- ent to transport the com- ponents to the building site. No heavy plant is needed to assemble the parts.

Easy Assembly - Connecting Pins Instead of Bolts

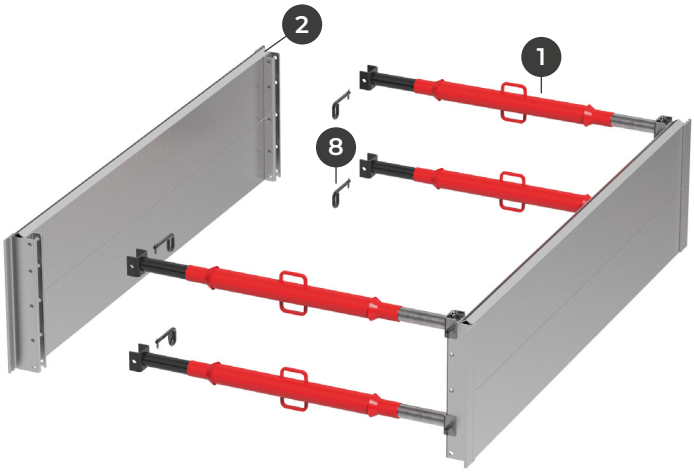
All the individual parts of a trench box are assembled with connecting pins - no bolts or tools necessary. Assembly is carried out on site, if necessary “step by step” in the excavation.

Fast Installation, Fast Removal

Complete trench boxes are easily installed and removed as complete units. These lightweight units require only light lifting gear. The trench struts are extended to match the trench width exactly.

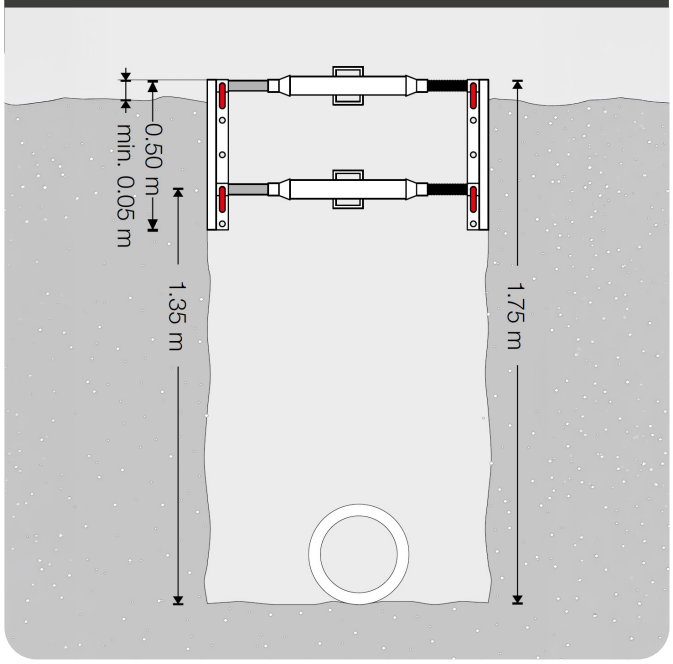
LITEBOX ALUMINIUM TRENCH EDGE SUPPORT | TRENCH BOX A

One frequent application for the LITEBOX aluminium trenching system is partial shoring with the aluminium trench edge support system in stable soils and for trenches no deeper than 1.75 m. Most buried services are within that depth. All the advantages of the modular system can be fully exploited for this straightforward application. A trench edge support unit weights no more than 130 kg.



Components for System A

1	LITEBOX Struts Gi-A	4
2	LITEBOX Panels	2
8	Standard Connecting Pins Ø 13 mm	8



Applications

Trench Depth	1.75 m
Trench Width	0.60 to 2.18 m
Max. Pipe Clearance Height	1.35 m

Max. Weight
with LITEBOX Struts Gi-A / 129 - 218

3.00 m LITEBOX Panels	130 kg
2.55 m LITEBOX Panels	119 kg
2.00 m LITEBOX Panels	103 kg
1.55 m LITEBOX Panels	93 kg

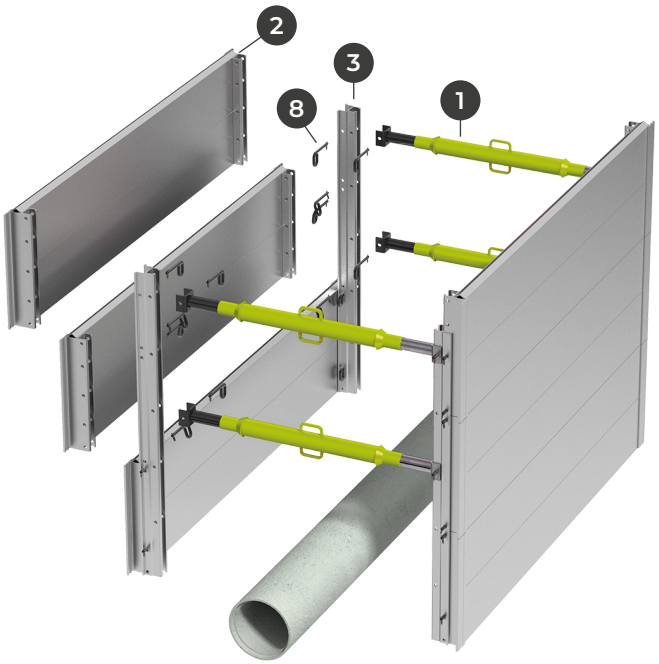


Securing Against Sliding Down

Sliding down of the trenching unit can be prevented by using Litebox universal lifting eyes with holding arms (see chapter special applications and supplements).

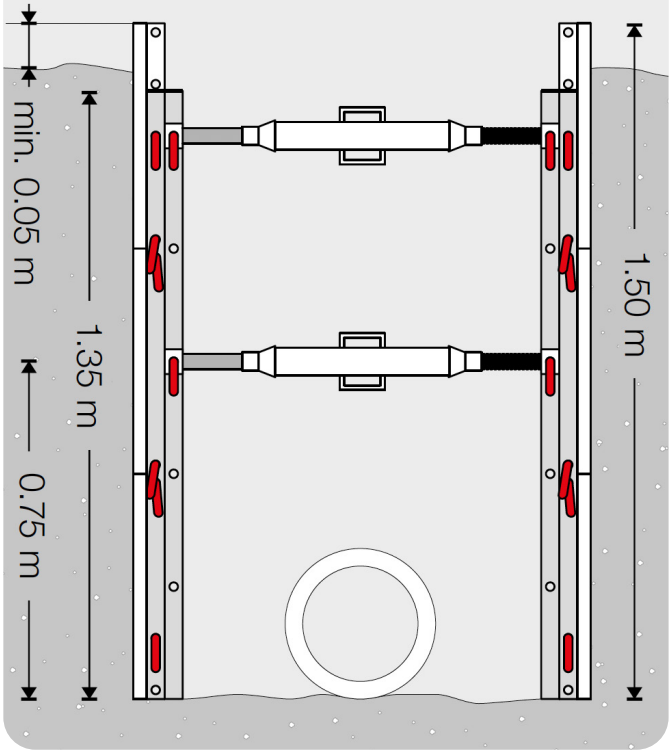
LITEBOX ALUMINIUM TRENCHING SYSTEM | TRENCH BOXES B TO K*

Soils that are only stable for short periods require full shoring. Several LITE- BOX panels are joined with aluminium panel connectors to form large trench boxes. Trenches as deep as 6 m can be quickly and safely excavated trench depths > 3m only with aluminium panels < 2m. Trench struts are available in different lengths for trenches up to 2.26 m wide. The shoring to wider trenches (max. 6.85 m) can be secured with push-pull props (see p. 16).



Components for System A

1	LITEBOX Struts Gi-A	4
2	LITEBOX Panels	6
3	Panel Connectors 0.28 m	-
	Panel Connectors 1.35 m	4
8	Standard Connecting Pins Ø 13mm	32



Applications

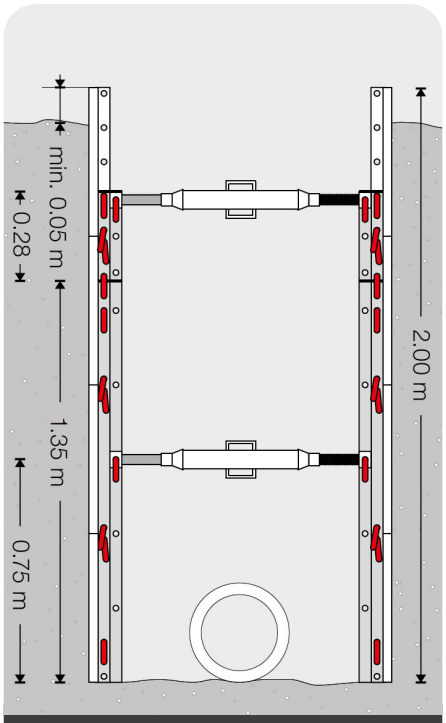
Trench Depth	1.50 m
Trench Width	0.68 to 2.26 m
Max. Pipe Clearance Height	0.75 m

Max. Weight
with LITEBOX Struts Gi-A / 129 - 218

3.00 m LITEBOX Panels	325 kg
2.55 m LITEBOX Panels	292 kg
2.00 m LITEBOX Panels	242 kg
1.55 m LITEBOX Panels	213 kg

**Trench depths > 3m (systems F to K only with LITEBOX panels < 2 m) not illustrated. Package of components can be compiled on request. If 0.28 m connectors are only used, more struts may be needed and pipe clearance can be reduced, as each panel has to be supported by a strut.*

Trench Box C



Components for System C

1	LITEBOX Struts Gi-A	4
2	LITEBOX Panels	6
3	Panel Connectors 0.28 m	4
	Panel Connectors 1.35 m	4
8	Standard Connecting Pins Ø 13mm	48

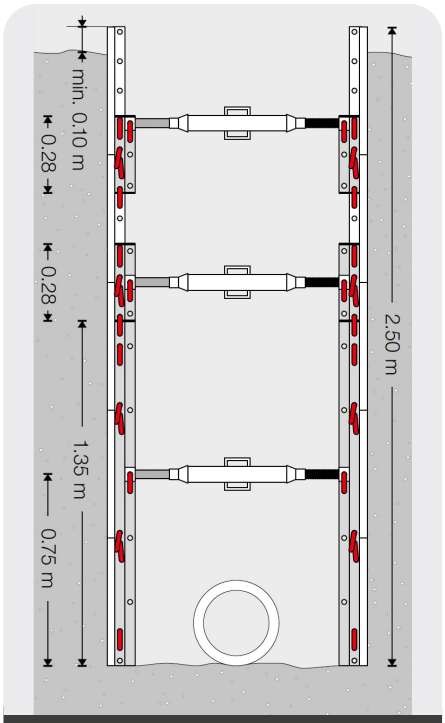
Applications

Trench Depth	2.00 m
Trench Width	0.68 to 2.26 m
Max. Pipe Clearance Height	0.75 m

Max. Weight
with LITEBOX Struts Gi-A / 129 - 218

3.00 m LITEBOX Panels	417 kg
2.55 m LITEBOX Panels	374 kg
2.00 m LITEBOX Panels	307 kg
1.55 m LITEBOX Panels	268 kg

Trench Box D



Components for System D

1	LITEBOX Struts Gi-A	6
2	LITEBOX Panels	10
3	Panel Connectors 0.28 m	8
	Panel Connectors 1.35 m	4
8	Standard Connecting Pins Ø 13mm	68

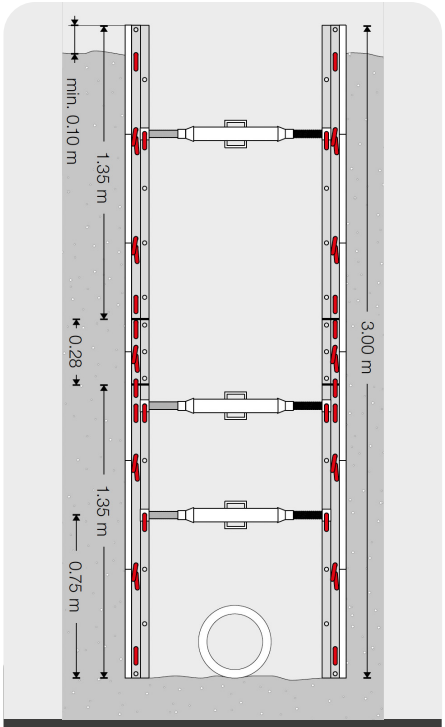
Applications

Trench Depth	2.50 m
Trench Width	0.68 to 2.26 m
Max. Pipe Clearance Height	0.75 m

Max. Weight
with LITEBOX Struts Gi-A / 129 - 218

3.00 m LITEBOX Panels	532 kg
2.55 m LITEBOX Panels	478 kg
2.00 m LITEBOX Panels	394 kg
1.55 m LITEBOX Panels	346 kg

Trench Box E



Components for System E

1	LITEBOX Struts Gi-A	6
2	LITEBOX Panels	12
3	Panel Connectors 0.28 m	4
	Panel Connectors 1.35 m	8
8	Standard Connecting Pins Ø 13mm	76

Applications

Trench Depth	3.00 m
Trench Width	0.68 to 2.26 m
Max. Pipe Clearance Height	0.75 m

Max. Weight
with LITEBOX Struts Gi-A / 129 - 218

3.00 m LITEBOX Panels	635 kg
2.55 m LITEBOX Panels	569 kg
2.00 m LITEBOX Panels	469 kg
1.55 m LITEBOX Panels	411 kg

Note: As an alternative to the 0.28 and 1.35 m panel connectors, it is also possible to use 1.85 m connectors.

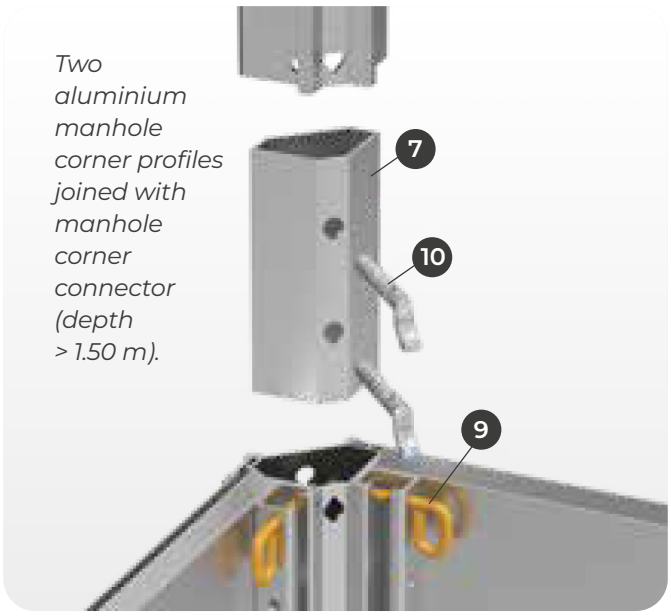
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LITEBOX ALUMINIUM ALUMINIUM MANHOLE FULL SHORING SYSTEM

System M (1.5 m excavation depth) & System N (6 m excavation depth, not illustrated)

Combining LITEBOX panels of different lengths enables shafts of various plan dimensions to be secured. An unobstructed working space without struts is possible in shafts down to a depth of 6 m (manhole > 3m only with panels < 2m). The simple and safe way to support jacking and working pits for installing pipes and cables underground. Left open on one side, the alu- minium manhole shoring system is ideal for closing the end of a trench.





Two aluminium manhole corner profiles joined with manhole corner connector (depth > 1.50 m).

Manhole Boxes

Applications

Excavation Depth	up to 6.00 m
Excavation Width	1.11 to 3.20 m

Components to 1.50 m Excavation Depth

2	LITEBOX Panels, Shaft Length	6
	LITEBOX Panels, Shaft Width	6
6	Manhole Corner Profiles 1.5 m	4
9	Connecting Pins Ø 13mm for Manhole Corner Profiles	48

Components to 3.00 m Excavation Depth *(without illusration)*

2	LITEBOX Panels, Shaft Length	12
	LITEBOX Panels, Shaft Width	12
6	Manhole Corner Profiles 1.5 m	8
9	Connecting Pins Ø 13mm for Manhole Corner Profiles	96
10	Connecting Pins Ø 20mm with Nib	8

Other excavation depths are possible in 50 cm steps.

Plan size < 2.20 x 2.20 m for manhole depths > 3 m.



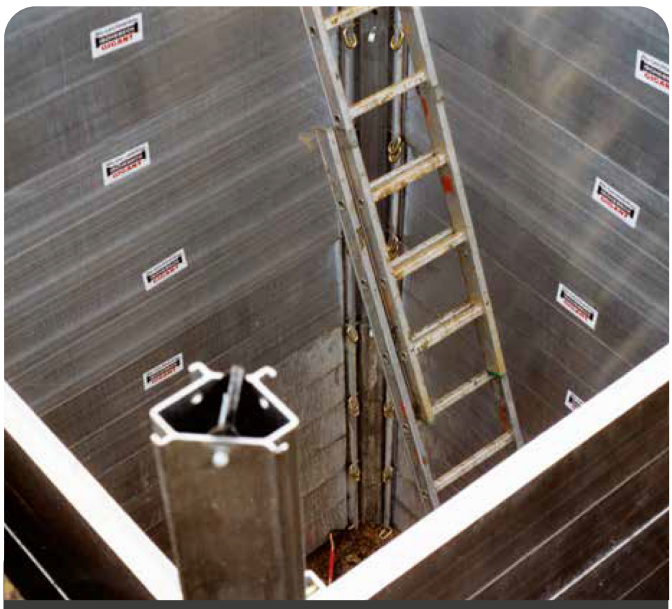
Easy Removal

Manhole shoring can be removed in one piece or dismantled and the parts removed separately.



Jacking and Working Pits

Fitting manhole corner profiles to the open side of the shaft shoring results in a maximum pipe clearance height of 1 m in the shaft.



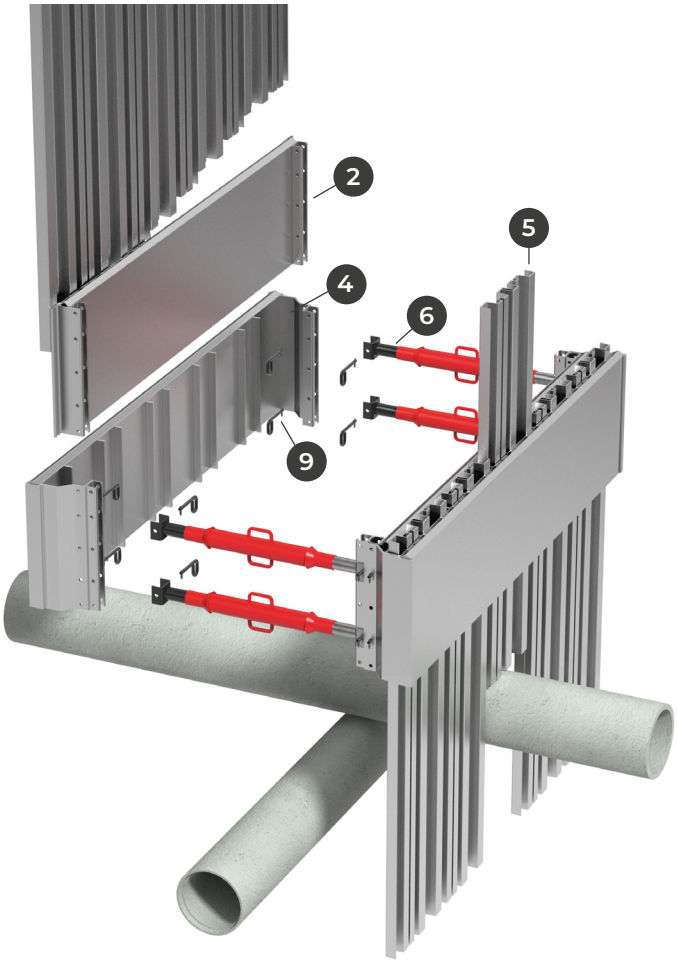
Sides Fully Supported

Up to a size of <2.20 m x 2.20 m on plan, the system is suitable for manholes as deep as 6 m.



LITEBOX ALUMINIUM TRENCH SHEETING SYSTEM

Leaving openings for crossing services and other obstacles in trenches as deep as 3 m is easy with the LITEBOX aluminium trench sheeting system. Combining aluminium trench panels and aluminium guide panels enables the aluminium trench sheets to be installed in the ground over the depth required. Excavations can then be carried out in controlled conditions, safeguarded at all times by the trench lining - even in friable, unstable soils.



Components

1	LITEBOX Struts Gi-A	4
2	LITEBOX Panels 2 m Long	2
4	Aluminium Guide Panels	2
5	Aluminium Trench Sheets	20
8	Standard Connecting Pins Ø 13mm	16

Trench Sheeting Box

Applications

Trench Width 0.91 to 2.49 m

Trench Max. 1.50 m Deep

- Aluminium trench sheet 1.50 m
- Pipe clearance height 1.00 m
- Aluminium trench sheets not embeddded in base of trench.

Trench Max. 2.00 m Deep

- Aluminium trench sheet 2.50 m
- Pipe clearance height 1.50 m
- Aluminium trench sheets not embeddded in base of trench.

Trench Max. 3.00 m Deep

- Aluminium trench sheet 3.50 m
- Pipe clearance height 2.50 m
- Additional horizontal bracing or aluminium trench sheets embedded in base of trench *(see LITEBOX aluminium trench sheeting system, instructions for installatioin and use)*

Max. Weight

with LITEBOX struts Gi-A / 129 -218

- 1.50 m Aluminium trench sheet 343 kg
- 2.50 m Aluminium trench sheet 457 kg
- 3.50 m Aluminium trench sheet 569 kg



The simple solution for complex situations and large pipe clearance heights.



Safe excavation with an unobstructed view and without relieving the effecting soil at adhesion.



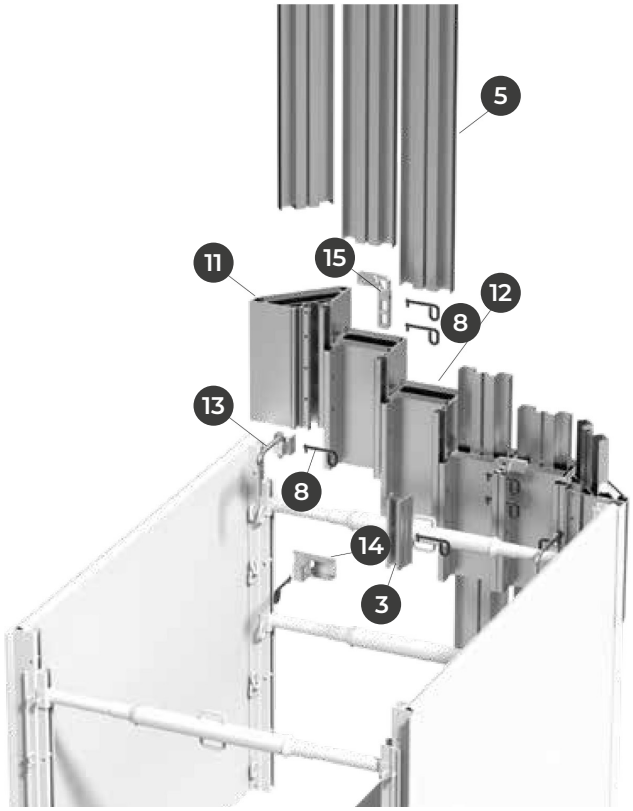
Lightweight and flexible, no need for heavy plant.

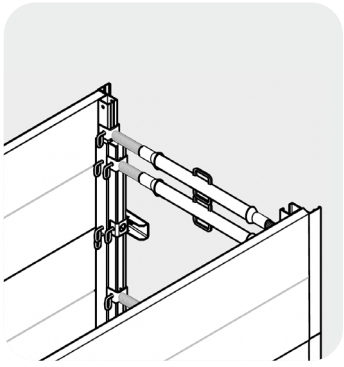
LITEBOX ALUMINIUM END-FACE SHORING

DIN 4124 applies for sloping back or otherwise securing the sides of any exca- vations, including end faces, to prevent collapse. Solutions with timber planks or steel panels assembled on site are time-consuming and costly, and in some cases are not adequately braced against the trench struts.

The LITEBOX aluminium end-face shoring can be easily adjusted to the trench width. To do this, the appropriate number of modular chamber elements are slotted together and secured with standard connecting pins. Aluminium trench sheets slotted into the modular chamber elements close off the end face over the full depth. End-face shoring can be pre-assembled and then lowered into place, but it is also possible to add individual parts once in place.

LITEBOX aluminium end-face shoring can be combined with the LITEBOX aluminium trenching and aluminium trench sheeting systems.





Note

We recommend fitting an additional trench strut (in the second hole from the top) for trench depths > 2 m in order to position the end-face shoring flush with the trench box.

Aluminium End-Face Shoring

Applications

Trench Width	0.84 to 2.35 m
Trench Max.	3 m Deep

Max. Weight

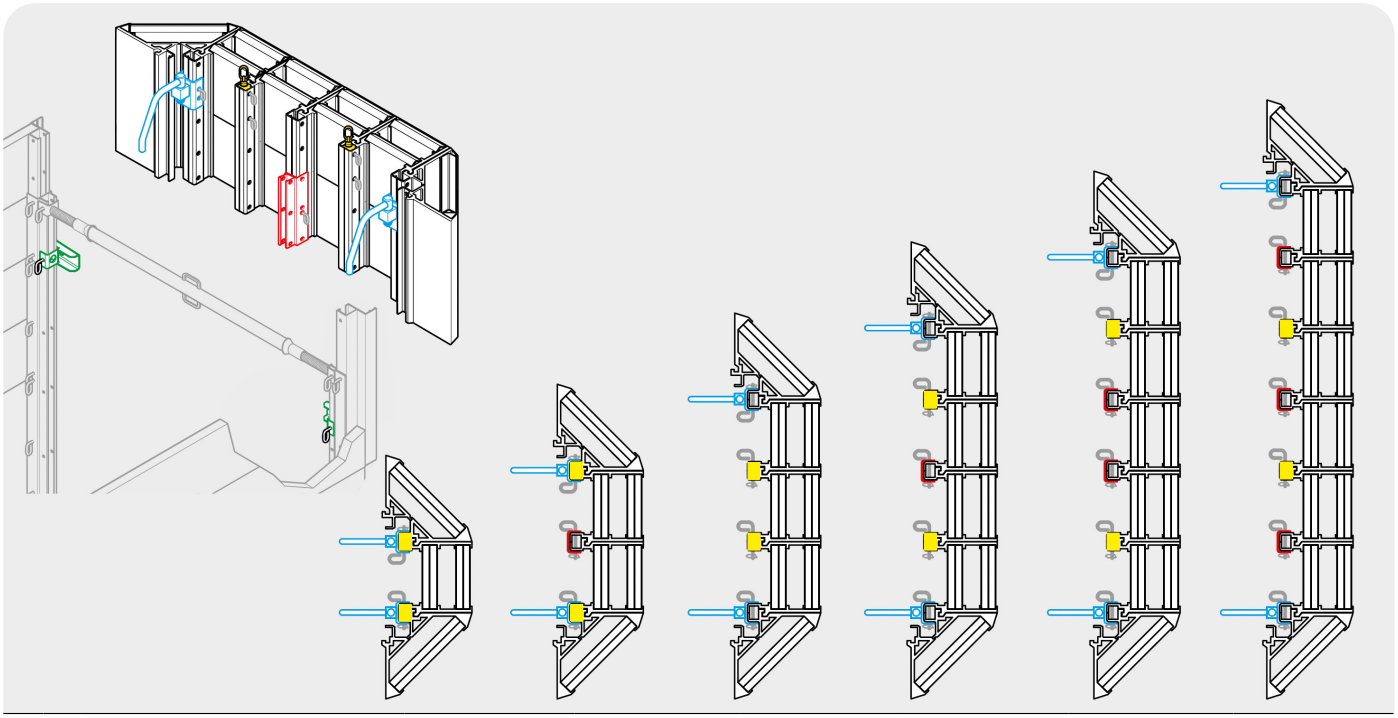
with LITEBOX Struts Gi-A / 129 - 21

Width of End-Face Shoring	Weight
0.84 m - 1.13 m	122.80 kg
1.08 m - 1.35 m	160.80 kg
1.33 m - 1.60 m	194.80 kg
1.58 m - 1.85 m	232.80 kg
1.83 m - 2.10 m	270.90 kg
2.08 m - 2.35 m	308.90 kg

Components for Aluminium End-Face Shoring

3	Panel Connectors 0.28 m	0 - 3
5	Aluminium Trench Sheets	1 - 7
8	Standard Connecting Pins Ø 13mm	4 - 9
11	Corner Element	2
12	Chamber Elemet	1 - 7
13	Swivel Cradle	2
14	Supporting Bracket	2
15	Universal Lifting Eye	2

LITEBOX ALUMINIUM END-FACE SHORING | *FOR TRENCH BOXES A TO E*



	Width of end-face Shoring	0.84 - 1.13 m	1.08 - 1.35 m	1.33 - 1.60 m	1.58 - 1.85 m	1.83 - 2.10 m	2.08 - 2.35 m
	Gi-A 60-81 without panel connector (with panel connector)	0.60 - 0.81 m (0.68 - 0.89 m)					
	Gi-A 80-121 without panel connector (with panel connector)	0.80 - 1.21 m (0.88 - 1.29 m)					
	Gi-A 129-218 without panel connector (with panel connector)		1.29 - 2.18 m (1.37 - 2.26 m)				
3	Panel Connectors 0.28 m	-	1	-	1	2	3
5	Aluminium Trench Sheets	3	4	5	6	7	8
8	Standard Connecting Pins	4	5	6	7	8	9
11	Corner Element	2	2	2	2	2	2
12	Chamber Element	1	2	3	4	5	6
13	Swivel Cradle	2	2	2	2	2	2
14	Supporting Bracket	2	2	2	2	2	2
15	Universal Lifting Eye	2	2	2	2	2	2

Overview of parts for aluminium end-face shoring with LITEBOX aluminium trench sheeting system: see LITEBOX aluminum trench sheeting/end-face shoring instructions for assembly and use.

TECHNICAL DATA

Earth pressure according to civil engineering employers' liability insurance association (TBG)

Trench Depth	< 3	4	5	6
Earth Pressure e_k [kN/m²]	17.50	23.00	28.60	34.10
Pipe Clerance Height [m]	0.75	0.75	0.50	0.50

LITEBOX aluminium trenching system (systems B to K)

Average weight approx. 30kg/m²

LITEBOX Panels [m]	3.00 x 0.50	2.55 x 0.50	2.00 x 0.5	1.55 x 0.50	0.91 x 0.50
Permissible Trench Depth [m]	3.00	3.00	6.00	6.00	6.00
Spacing of Trench Struts in Trench Direction [m]	2.85	2.40	1.85	1.40	0.76

In the case of repositioning trench struts while laying the pipe, the largest permissible spacing of the trench struts may not exceed 1.15 m.

LITEBOX aluminium manhole shoring system

15 possible plan forms for aluminium manhole shoring system [m]:

3.00 x 3.00 (3.20 x 3.20)		-	-	-
3.00 x 2.55 (3.20 x 2.75)	2.55 x 2.55 (2.75 x 2.75)			
3.00 x 2.00 (3.20 x 2.20)	2.55 x 2.00 (2.75 x 2.20)	2.00 x 2.00 (2.20 x 2.20)	-	-
3.00 x 1.55 (3.20 x 1.75)	2.55 x 1.55 (2.75 x 1.75)	2.00 x 1.55 (2.20 x 1.75)	1.55 x 1.55 (1.75 x 1.75)	-
3.00 x 0.91 (3.20 x 1.11)	2.55 x 0.91 (2.75 x 1.11)	2.00 x 0.91 (2.20 x 1.11)	1.55 x 0.91 (1.75 x 1.11)	0.91 x 0.91 (1.11 x 1.11)

Dims. in ( ) = external dims. of aluminium manhole shoring system.

LITEBOX aluminium trench sheeting system

Average weight approx. 30 kg/ m²

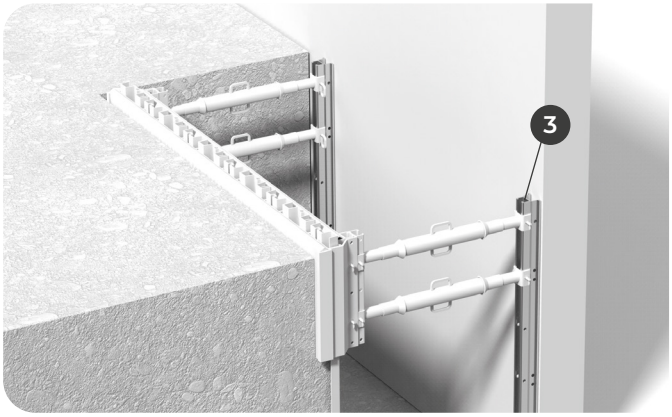
LITEBOX Panel [m]	2.00 x 0.50	2.00 x 0.50
Aluminium Trench Sheet [m]	2.50 without embedment	3.00 with embedment in base of trench
Pipe Clearance Height [m]	1.50	2.50

The LITEBOX aluminium trenching system complies with DIN 4124 (Excavations and trenches) and EN 13331 (Trench lining systems), and in Germany has been checked for safety by DGUV test - testing and certification bodies of the German Social Accident Insurance (DGUV).

SPECIAL APPLICATIONS AND SUPPLEMENTS | *VERSATILE MODULAR SYSTEM*

Wide trenches, unusual situations or stricter safety requirements? By combining the various components or combining them with components from the extensive ISCHEBECK formwork range, it is possible to extend the range of applications of this already versatile modular system.

Shoring On One Side Only



Aluminium panel connectors are used where shoring is required on one side of a trench only (e.g. adjacent basement walls).

- Works with full shoring in LITEBOX aluminium trenching and aluminium trench sheeting systems.

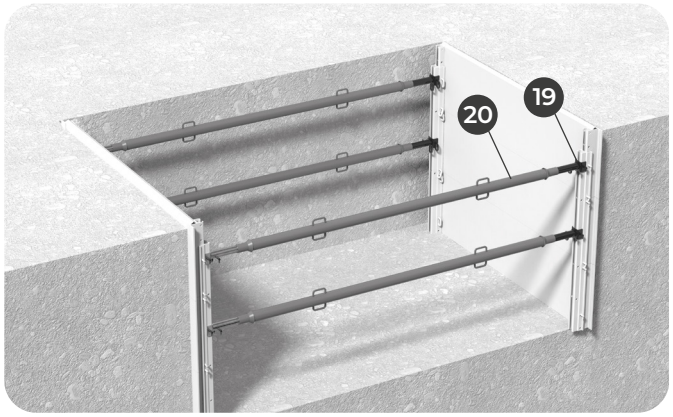
Trench Depth and Width

- The trench depth depends on the permissible trench depths for the different systems.
- Trenches up to 6.85 m wide (with push pull-props)*

Components

3 Aluminium panel connector available in the lengths: 0.28/1.35/1.85m

Wide Trenches



The trench struts can be replaced by TITAN RSK push-pull props in the case of wide trenches.* The props are connected to the aluminium panel connector with RSK adapters. This enables trenches up to 6.85 m wide to be secured. TITAN RSK push-pull props can be used with full shoring in the LITEBOX aluminium trenching and aluminium trench sheeting systems.

Trench Depth and Width

- The trench depth depends on the permissible trench depths for the different systems.
- Trenches up to 6.85 m wide (push pull-props)*

Components

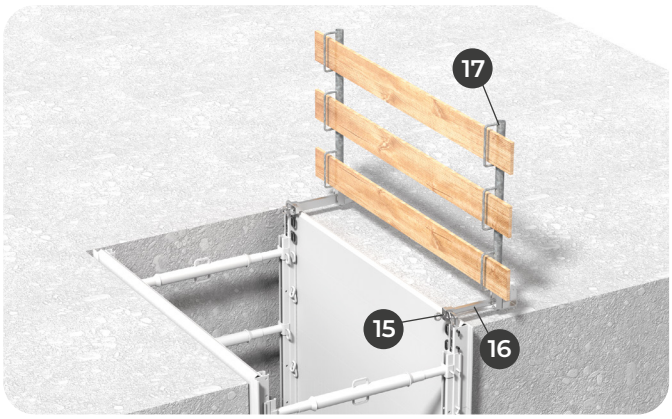
19 TITAN RSK push-pull prop

20 RSK adapter

**The permissible loads for push-pull props may not be exceeded. For further information please consult the push-pull props TITAN brochure.*

SPECIAL APPLICATIONS AND SUPPLEMENTS | *VERSATILE MODULAR SYSTEM*

Securing Against Sliding Down



Sliding down of the trench shoring can be prevented by using LITEBOX universal lifting eyes with holding arms (see chapter special applications and supplements).

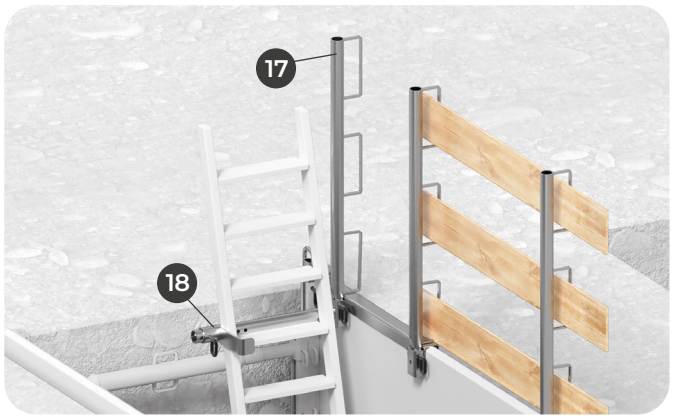
Edge Protection

Rail posts can be inserted directly into the panel or holding arm to prevent people from falling down. Suitable side protection boards (e.g. 150x30 sorting class S10 or better) are provided by the customer.

Components

15 Universal Lifting Eye
16 Holding Arm
17 LITEBOX Rail Post Gi-A

LITEBOX Ladder Support



The ladder support secures ladders to the trenching unit. Rail posts can also be inserted at the access point.

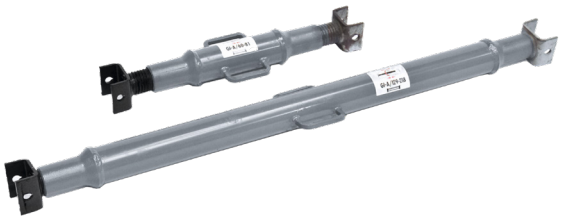
Suitable for ladders from 410 to 580 mm wide. The ladder support can be used in LITEBOX aluminium trenching system and manhole shoring system including full-shoring.

Components

17 LITEBOX Rail Post Gi-A
18 LITEBOX Ladder Support

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OVERVIEW OF SYSTEM COMPONENTS AND USEFUL ACCESSORIES



1 Trench Strut Gi-A (incl. 2 Standard connecting pins Ø 13mm)

	Gi-A / 60 - 81	Gi-A / 80 - 121	Gi-A / 129 - 218
External dims. LITEBOX aluminum trenching system without connector	0.60 - 0.81 m	0.80 - 1.21 m	1.29 - 2.18 m
External dims. LITEBOX aluminum trenching system with connector	0.72 - 0.89 m	0.92 - 1.29	1.41 - 2.26 m
External dims. LITEBOX aluminum trenching sheeting system	0.91 - 1.12 m	1.11 - 1.52 m	1.60 - 2.49 m
Permissible loading depending on spindle travel	103.5 - 56.4 kN	98.9 - 56.1 kN	84.3 - 44.2 kN
Weight	5.54 kg	7.35 kg	11.49 kg
Art.no.	655.013050452	655.0130504525	655.0130504526



2 Trench Strut Gi-A

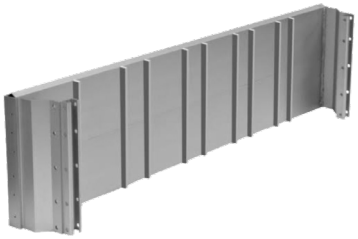
Length	Weight	Art.no.
0.91 m	14.28 kg	655.023050021
1.55 m	23.50 kg	655.0130500010
2.00 m	28.30 kg	655.0130500011
2.55 m	36.66 kg	655.0130500013
3.00 m	42.10 kg	655.0130500012



3 Panel Connector

(incl. 4, 6 or 8 Standard connecting pins Ø 13mm)

Length	Weight	Art.no.
0.28 m	2.03 kg	655.0130504587
1.35 m	6.55 kg	655.0130504590
1.85 m	9.00 kg	655.0130504594



4 Aluminium Guide Panel

(incl. 4 Standard connecting pins Ø 13mm)

Length	Weight	Art.no.
2.055 m	37.00 kg	655.0130504580



5 Aluminium Trench Sheet

A total of 20 aluminium trench sheets are required per trench sheeting unit.

Length	Weight	Art.no.
1.50 m	8.30 kg	655.0630500082
2.50 m	14.00 kg	655.0630500084
3.50 m	19.60 kg	655.0630500086



6 Manhole Corner Profile

(incl. 4 or 12 Standard connecting pins Ø 13mm, yellow)

Length	Weight	Art.no.
0.50 m	3.80 kg	655.0130504593
1.50 m	13.70 kg	655.0130504597



7 Manhole Corner Connector

(incl. 2 Standard connecting pins Ø 20 mm, with nib)
For connecting two aluminium manhole corner profiles for deeper shafts.

Length	Weight	Art.no.
0.30 m	1.40 kg	655.0130504598

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