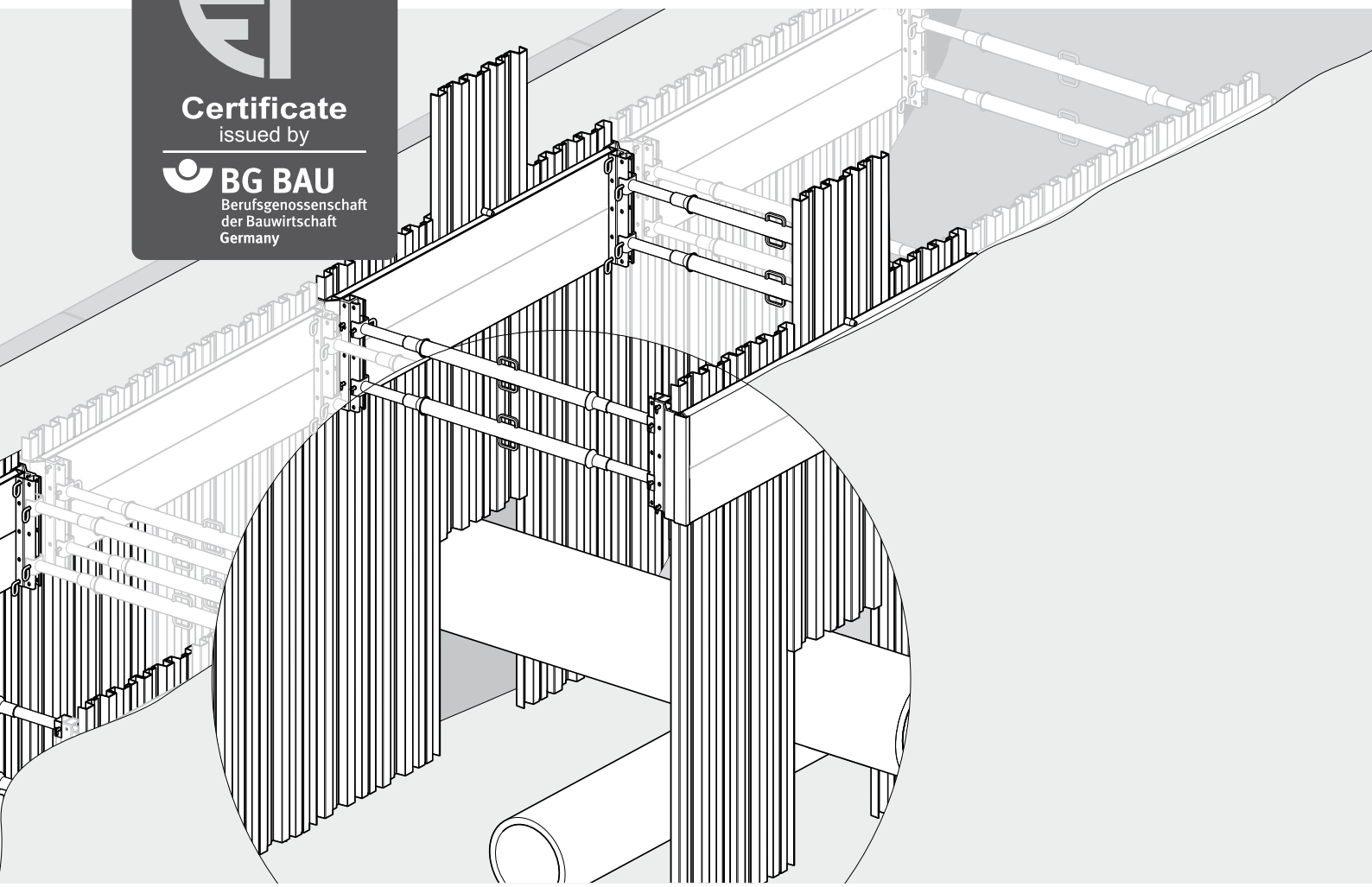
ISCHEBECK GIGANT

Euro Test®

Certificate
issued by
BG BAU
Berufsgenossenschaft
der Bauwirtschaft
Germany



LITEBOX aluminium trench sheeting system

Instructions for assembly and use | Position as of July 2020

Contents

The LITEBOX aluminium trenching system complies with DIN 4124 (Excavations and trenches) and DIN EN 13331 (Trench lining systems) and has been tested for occupational safety by the testing and certification body of the German Social Accident Insurance Association (DGUV).

1. Introduction

Shoring for smaller trenches, max. 3 m deep x max. 2.50 m wide, can be quickly and easily installed using the aluminium guide panels in combination with the aluminium Litebox panels and trench sheets of the LITEBOX aluminium trenching system. The aluminium Litebox guide frame component is a practical addition to the LITEBOX aluminium trenching system. Two aluminium guide frames plus four Gi-A trench struts form one trench box. Aluminium trench sheets are driven into the ground between the aluminium guide frame and Litebox panels. The excavation work can then be carried out afterwards in safe conditions. Alternatively, the aluminium trench sheets and excavation can be installed simultaneously. The aluminium trench sheets can be installed "visibly", which enables any obstacles in the ground to be detected in good time. DIN 4124, section 5.2.3, applies for securing or shoring the sides of excavations, including end faces, to prevent collapse. ISCHEBECK recommends using our LITEBOX aluminium end-face shoring for end faces.

2. Safety advice

The relevant legislation, standards and safety directives currently valid in the respective country of use must be complied with at all times. Ensure you are familiar with these and that neither you nor your colleagues infringe any regulations.

- Aluminium trench boxes may only be installed, removed and/or relocated by persons who have been fully instructed in the use of the system.
- These instructions describe how to assemble and dismantle the system in accordance with its designated use. Other procedures are conceivable, provided these comply with the safety regulations and do not result in overloaded components.
- The aluminium trench boxes and their components may only be loaded in the ways described here. Other applications must be validated separately by an engineer.
- Only use components that are in good working order. Damaged components must be rejected. Repairs may only be carried out by the manufacturer.

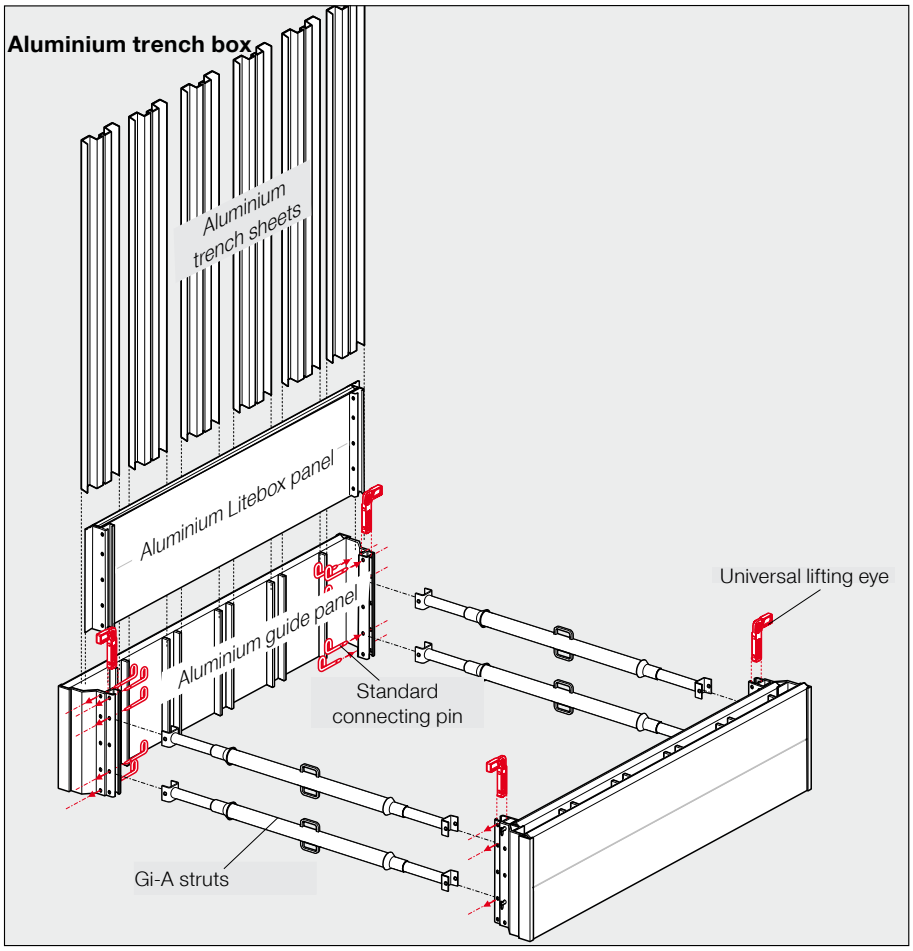


Fig. 1 | Assembly principle for aluminium trench box

- Never enter an open, unsecured trench.
- Trenches > 1.25 m deep must be provided with a ladder for access/egress.
- Both screw threads of every trench strut must be extended by the same amount (Fig. 2).
- Ensure that all the galvanised screw threads of the trench struts are on one side of the trench and all the painted screw threads on the other side (Fig. 2).
- The trench box must extend min. 5 or 10 cm above the top edge of the trench
- Once the trench box has been positioned in the trench, backfill all voids between the shoring and the sides of the trench (Fig. 15).

3. Standards and regulations

DIN 4124	Excavations and trenches
DIN EN 13331	Trench lining systems
Part 1:	Product specifications
Part 2:	Assessment by calculation or test

The relevant safety rules currently valid in the respective country of use must be complied with at all times.

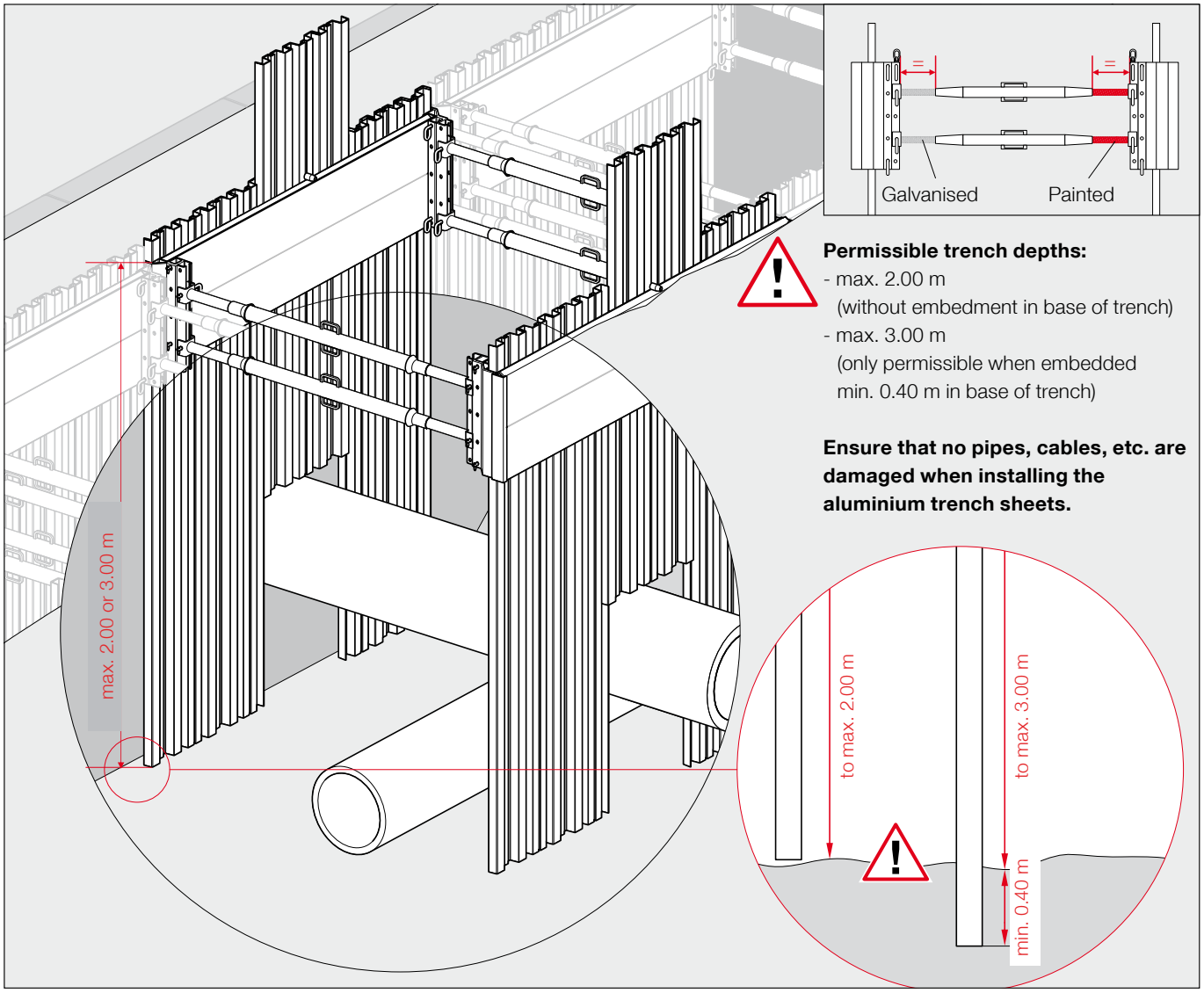
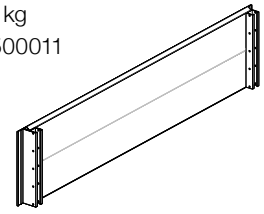


Fig. 2

❶ Litebox Panel

In this application the 2.00 m aluminium Litebox panel resists the support reaction of the aluminium trench sheets.
Maximum load: Support reaction due to aluminium trench sheets,
max. 47 kN/m (design value)

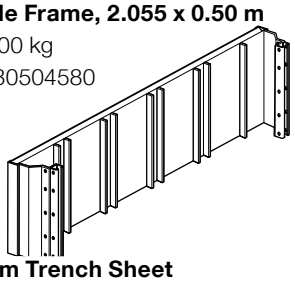
Litebox Panel, 2.00 x 0.50 m
Weight: 28.30 kg
Art.-no.: 0130500011



❷ Litebox Guide Frame

The aluminium guide panel resists the earth pressure over a max. depth of 0.5 m. It is fixed to the 2.00 m aluminium Litebox panel with 4 standard connecting pins. Together with the aluminium trench panel, it forms the guide unit for the aluminium Litebox sheets.
- incl. 4 standard Ø13 mm connecting pins

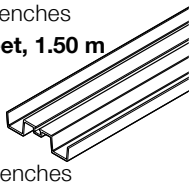
Litebox Guide Frame, 2.055 x 0.50 m
Weight: 37.00 kg
Art.-no.: 0130504580



❸ Aluminium Trench Sheet

A total of 20 aluminium trench sheets are required per aluminium trench box.
- Section modulus W = 25.8 cm³
- Moment of inertia I = 66 cm4
- Bending moment Md = 6.33 kNm

For max. 1,50 m deep trenches
Aluminium Trench Sheet, 1.50 m
Weight: 8.31 kg
Art.-no.: 0630500082



For max. 2.00 m deep trenches
Aluminium Trench Sheet, 2.50 m
Weight: 14.00 kg
Art.-no.: 0630500084

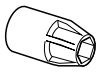
For max. 3.00 m deep trenches
Aluminium Trench Sheet, 3.50 m
Weight: 19.60 kg
Art.-no.: 0630500086

❹ Standard Connecting Pin, Ø13 mm

with drop-down locking nib.
Connecting pins are required to connect the individual parts together.
Black.
Weight: 0.25 kg
Art.-no.: 0130500088

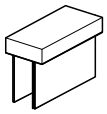
❺ Post Shore Positioner 50

(TITAN Aluminium Megashore System accessory)
Attach this block to the aluminium trench sheets to prevent slippage.
Weight: 0.10 kg
Art.-no.: 0620490059



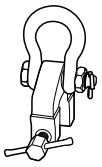
❻ Driving Head

This protects the aluminium trench sheets when being installed with an excavator bucket or similar plant.
Weight: 2.83 kg
Art.-no.: 0630500083



❼ Lifting Clamp

This is fitted to an aluminium trench sheet so that it can be extracted with an excavator bucket or similar plant.
Weight: 3.00 kg
Art.-no.: 0630500081

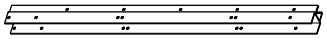


❽ Aluminium Panel Connector

When using the aluminium trench sheeting system, the connector can be used as an additional waler.

Panel Connector, 0.28 m
- incl. 4 standard Ø13 mm connecting pins
Weight: 2.03 kg
Art.-no.: 0130504587

Panel Connector, 1.35 m
- incl. 6 standard Ø13 mm connecting pins
Weight: 6.55 kg
Art.-no.: 0130504590



❾ Spring Clip with Speed Thread T-bolt 12 x 50 mm

(TITAN Aluminium Mega-shore System accessory, optional). For fixing walers to aluminium trench sheets.
Weight: 0.24 kg
Art.-no.: 0620450012

Trench box components

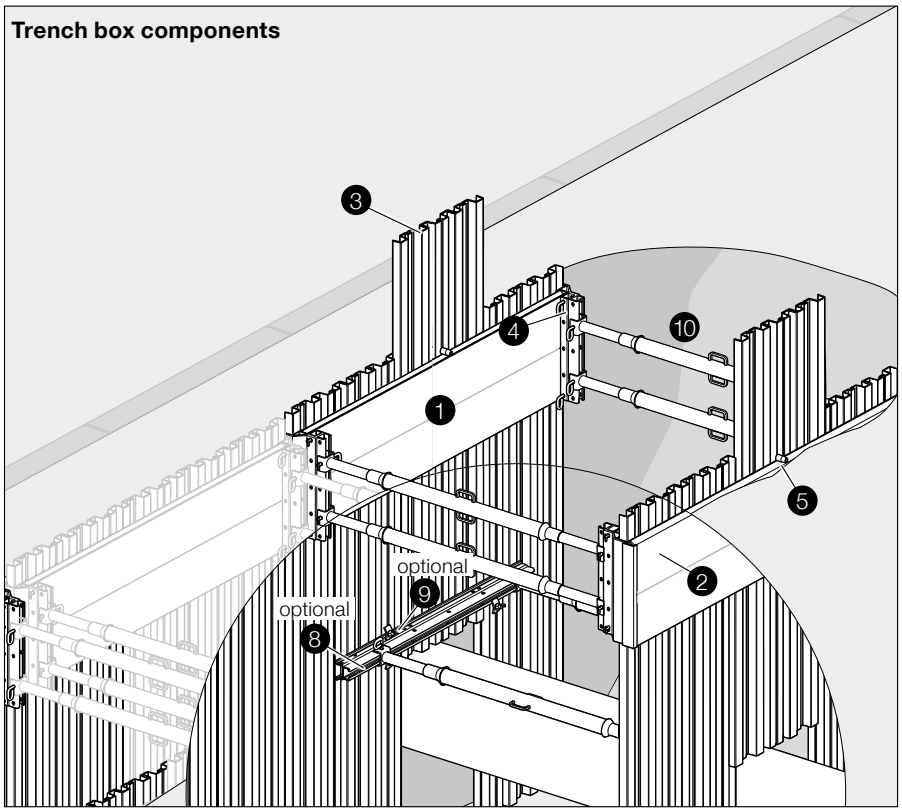


Fig. 3 |

❿ Strut Gi-A

The infinitely adjustable Gi-A struts ensure secure propping for trenches 0.91 to 2.49 m wide.
Trench struts can also be attached to the aluminium panel connector.
- incl. 2 standard Ø13 mm connecting pins

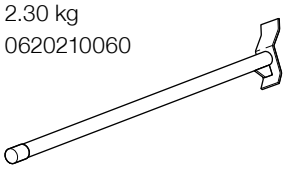
Strut Gi-A/ 60-81
Weight: 5.54 kg
Art.-no.: 0130504524
Trench widths: 0.91 - 1.12 m

Strut Gi-A/ 80-121
Weight: 7.14 kg
Art.-no.: 0130504525
Trench widths: 1.11 - 1.52 m

Strut Gi-A/ 129-218
Weight: 11.49 kg
Art.-no.: 0130504526
Trench widths: 1.60 - 2.49 m

⓫ Universal-Litebox Spanner

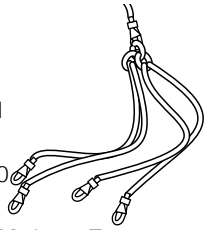
Trench struts can be tightened and released easily with this tool.
Weight: 2.30 kg
Art.-no.: 0620210060



Optional accessories

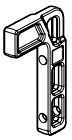
⓬ Lifting Sling

Leg length: 2.50 m
permissible load: 10 kN
Weight: 3.61 kg
Art.-no.: 0630500040



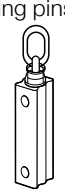
⓭ Litebox Universal Lifting Eye

One lifting eye is attached to each of the four corners of a trench box. A hook can then be attached to each one so that the trench box can be lifted and placed in a trench or lifted out of a trench.
- incl. 2 standard Ø13 mm connecting pins
- permissible load: 10 kN
Weight: 2.10 kg
Art.-no.: 0630504542



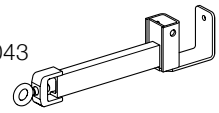
⓮ 3-D Lifting Eye

3-D lifting eyes can be used instead of universal lifting eyes.
- incl. 2 standard Ø13 mm connecting pins
- permissible load: 10 kN
Weight: 1.50 kg
Art.-no.: 0130504541
(to be discontinued)



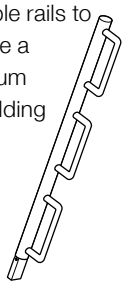
⓯ Holding Arm

prevents a trench box from slipping into the trench. It is mounted on a lifting eye. It can also be used as a fixing for a rail post.
- hot-dipped galvanized
Weight: 3.10 kg
Art.-no.: 0630500043



⓰ Litebox Rail Post

Used in conjunction with suitable rails to set up a safety barrier alongside a trench. Can be fixed to aluminium Litebox panels directly or to holding arms.
- Ø 48 mm x 1.10 m
- hot-dipped galvanized
Weight: 5.36 kg
Art.-no.: 0130500089



⓱ End-face shoring

For securing the end faces of a trench against collapse. Our aluminium end-face shoring is a modular system that can be easily adapted to the width of the trench and covers the complete extension range of Gi-A trench struts. Suitable for use in max. 3 m deep trenches.
(Please refer to the instructions for the assembly and use of aluminium end-face shoring.)

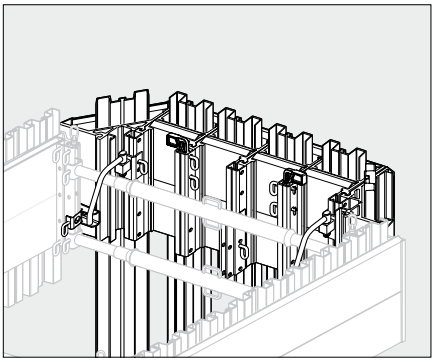
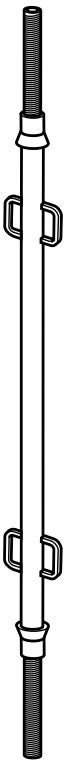


Fig. 4 Example of end-face shoring

⓲ TITAN RSK push-pull prop

For large trenches up to about 6.85 m wide. The permissible loads for push-pull props may not be exceeded.
With screw thread at both ends; left- and right-hand threads. Pin handle (Art.-no. 0220210027) or M16x80 grade 8.8 bolt required.



RSK 3 (1.80 m – 3.20 m)
Weight: 15.60 kg
Art.-no.: 0220200039

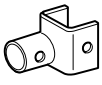
RSK 4 (2.60 m – 4.00 m)
Weight: 19.80 kg
Art.-no.: 0220200041

RSK 6 (4.60 m – 6.00 m)
Weight: 35.00 kg
Art.-no.: 0220200042

RSK 8 (6.20 m – 7.60 m)
Weight: 68.50 kg
Art.-no.: 0220200043

⓳ Adapter RSK

For connecting TITAN push-pull props. Required for wider trenches. Standard Ø 13 mm connecting pin required.
Weight: 0.68 kg
Art.-no.: 0130500069



5.1 Assembling an aluminium trench box

As an example, the following steps describe the assembly of max. 2 m deep trenches. The width of the trench can be chosen as required between 0.91 and 2.49 m depending on the Gi-A trench strut being used.

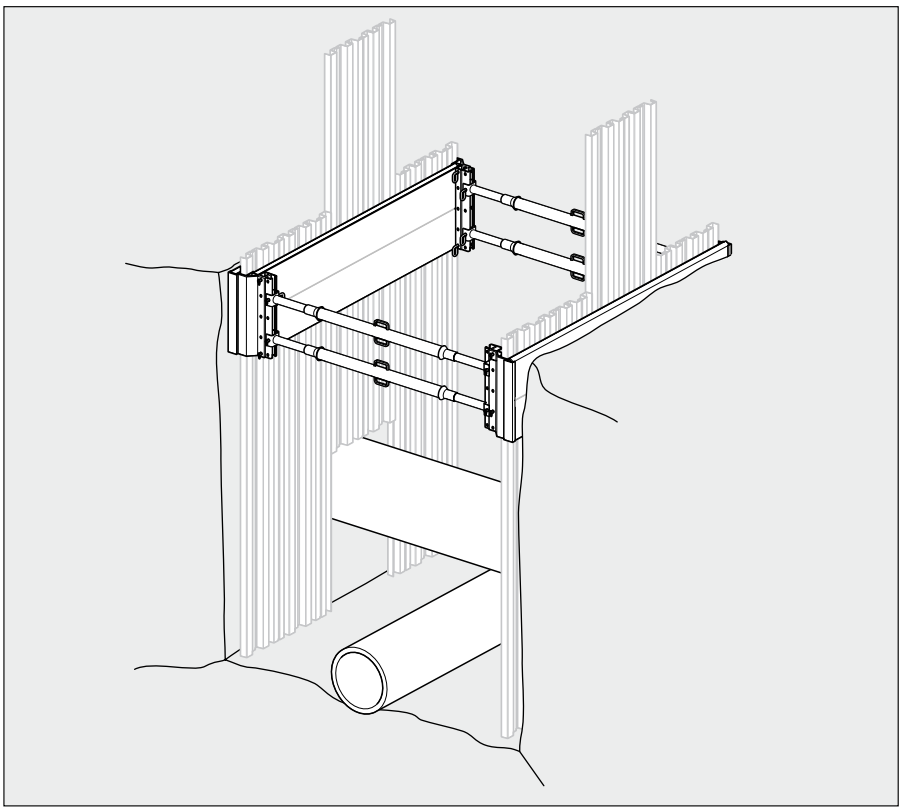


Fig. 5

Take an aluminium Litebox panel 1 and fix it with 4 standard Ø13 mm connecting pins 4 to an aluminium Litebox guide frame 2 to form a complete side panel. Ensure that the standard Ø13 mm connecting pins are inserted with the grip on the inside.

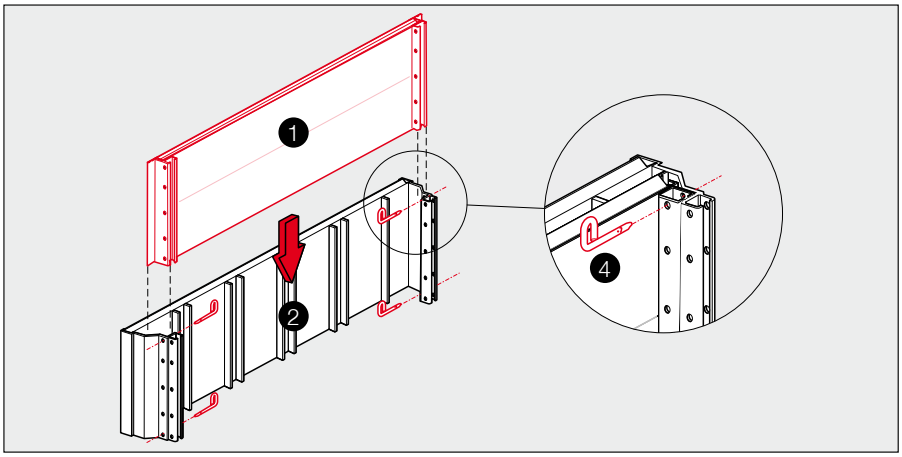


Fig. 6

Always insert standard Ø13 mm connecting pins with the grip turned upwards. Afterwards, turn it downwards. The standard Ø13 mm connecting pin is secured when the locking nib drops down.

Join together two complete side panels to form one complete aluminium trench box using 4 Gi-A trench struts 10 (2 standard Ø13 mm connecting pins per strut). Ensure that the screw threads face the same direction when installing the struts. This will simplify later adjustments with the strut spanner.
left-hand thread = painted (black)
right-hand thread = galvanised (silver)

Ensure that the standard connecting pins are inserted with the grip on the inside.

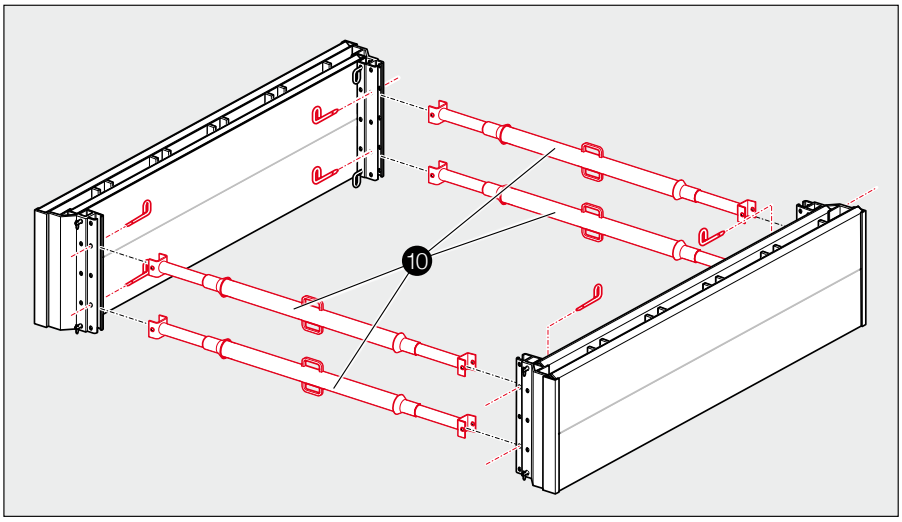


Fig. 7

5.2 Installing a trench box

Attach universal lifting eyes ⓭ to the topmost Litebox panels with standard Ø13 mm connecting pins so that the trench box can be lowered into position with the help of aheavy-duty plant such as an excavator, crane, etc.

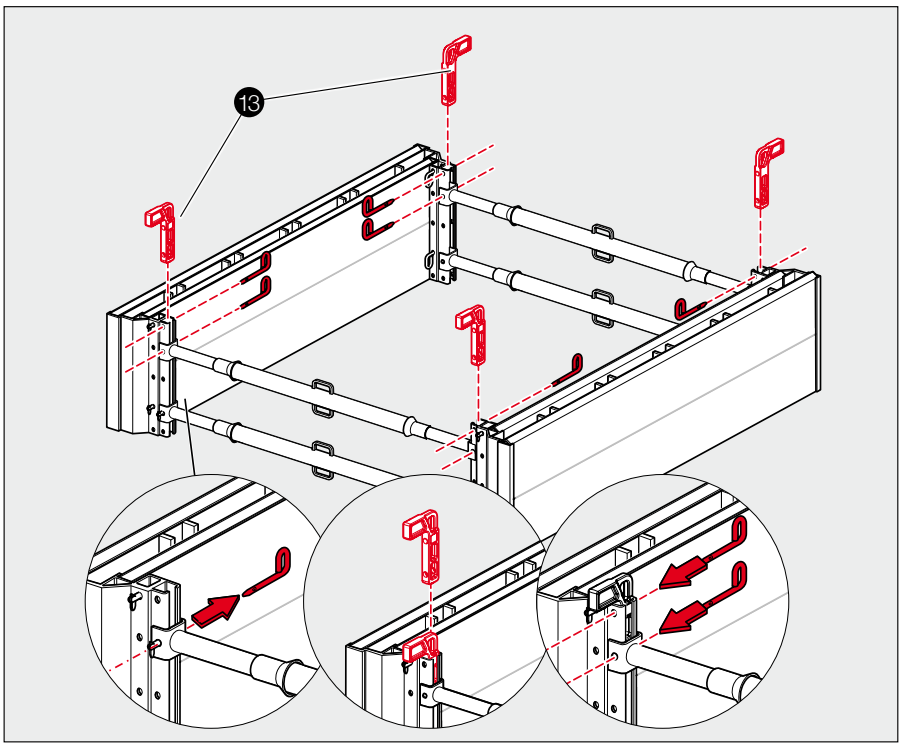


Fig. 8

Fully assembled aluminium trench box.

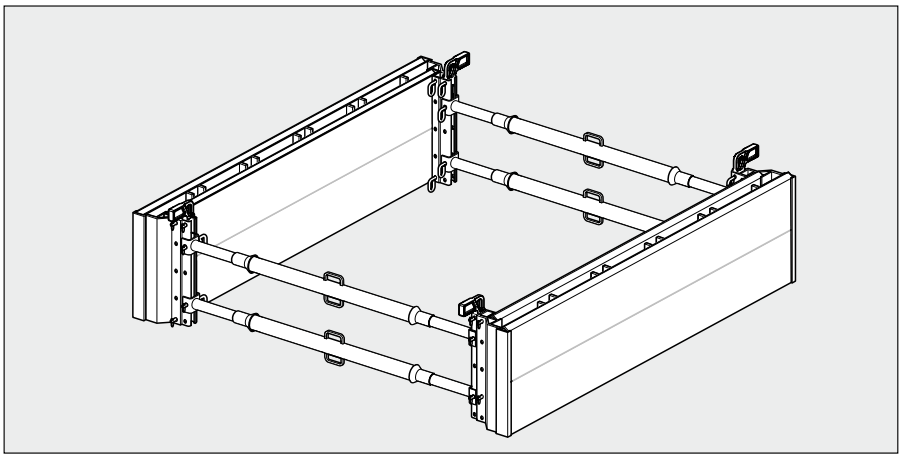


Fig. 9

6. Installation

6.1 Preliminary excavation

Excavate the trench down to a depth of 0.50 m.

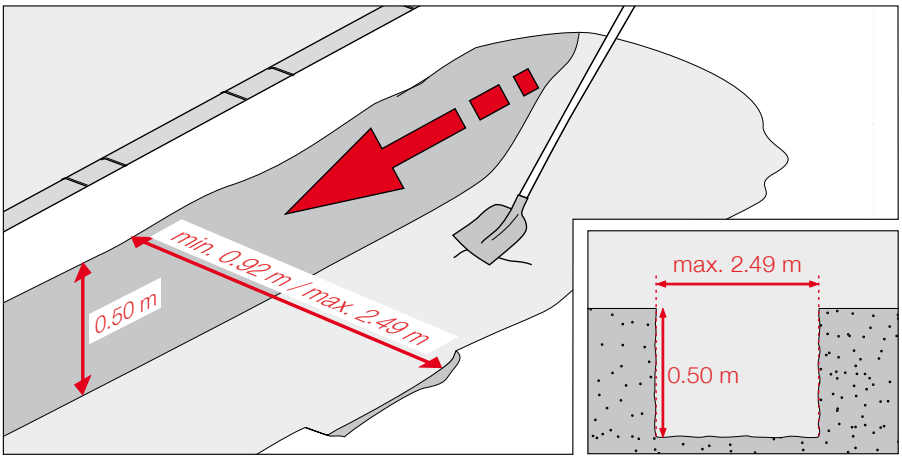


Fig. 10

6.2 Installing an aluminium trench box

Lower the trench box into the excavation with the help of a lifting sling 12. The top edge of the box should be flush with ground level.

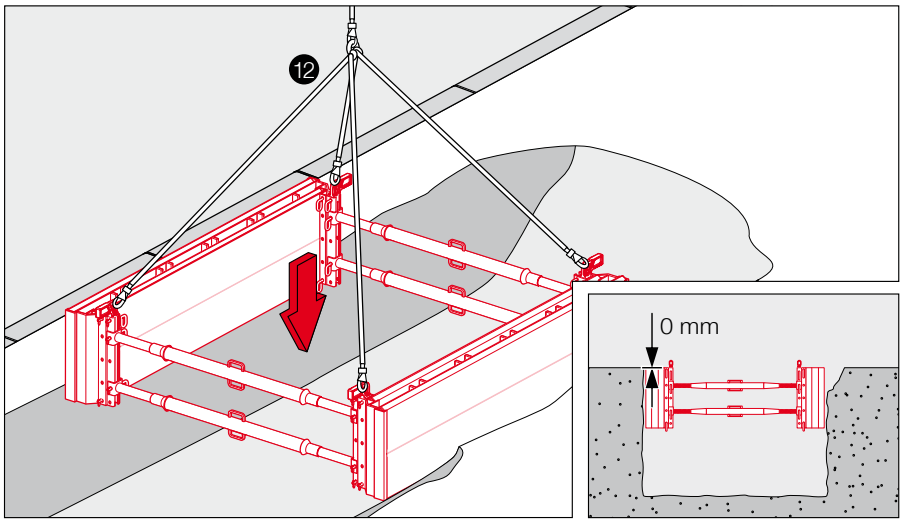
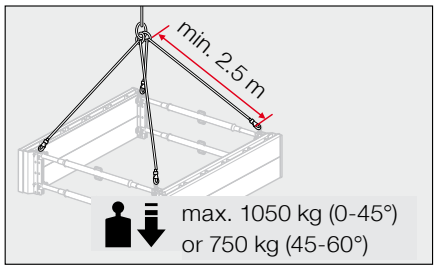
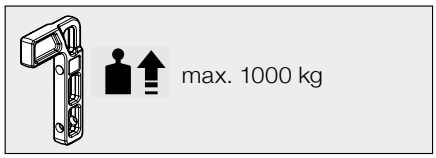


Fig. 11





Extend the screw threads of the trench struts outwards on both sides with the universal strut spanner 11.

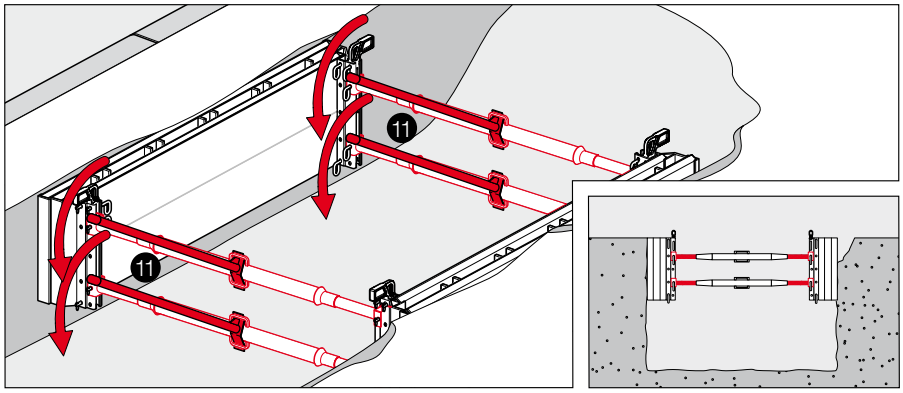


Fig. 12

Additional protection to prevent trench box slipping down into trench

The trench box can be additionally secured with holding arms 15 if required. Mount the holding arms on the universal lifting eyes and fix them in place with the integrated screws.

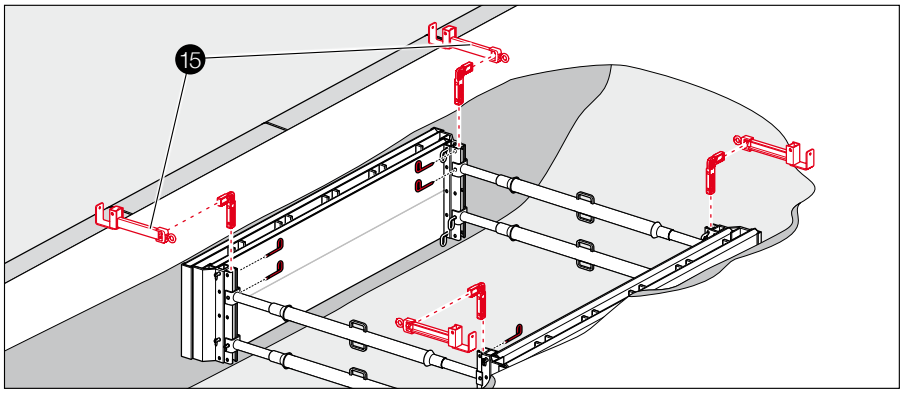


Fig. 13

6.3 Installing the aluminium trench sheets

Insert the aluminium trench sheets ❸ through the gap between Litebox guide frame and Litebox panel and drive them into the ground using a suitable plant. For example, aluminium trench sheets fitted with a driving head ❻ can be pressed into the ground with an excavator bucket or driven with an excavator-mounted vibrator.

Ensure that no pipes, cables, etc. are damaged when installing the aluminium trench sheets. If any resistance is encountered, investigate the cause immediately.

Ensure that aluminium trench sheets are not deformed or damaged during installation.

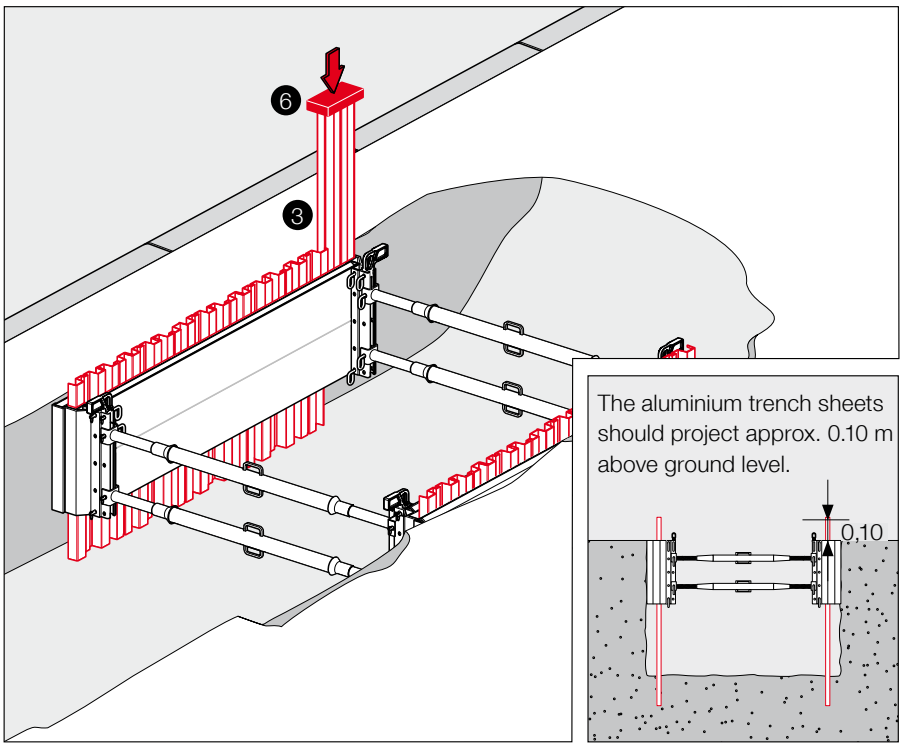


Fig. 14

Backfill any voids between the trench shoring and the sides of the trench.

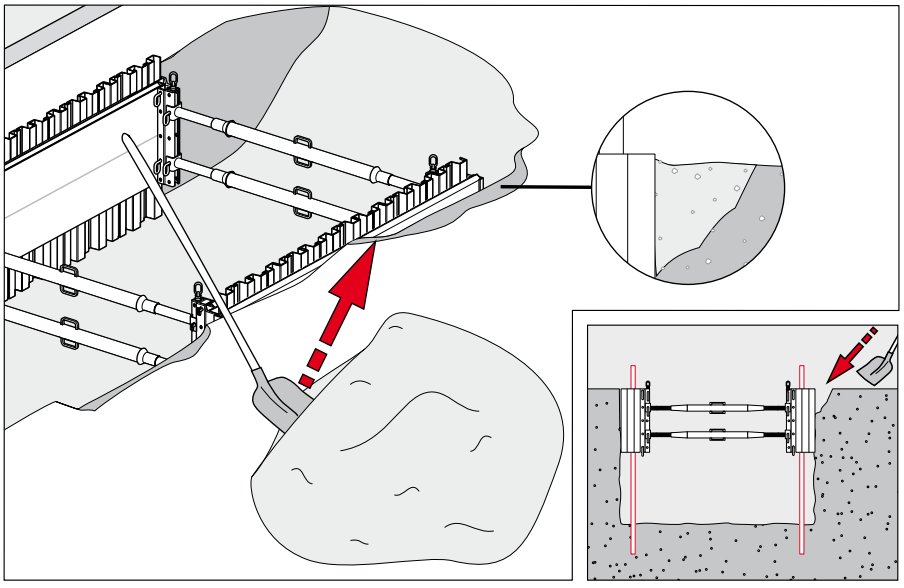


Fig. 15

Install further aluminium trench boxes as required.

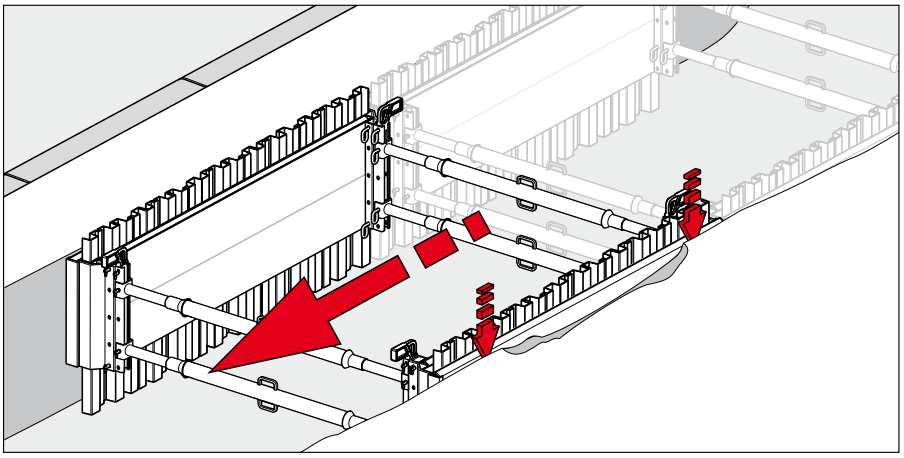


Fig. 16

Continue with the excavation.

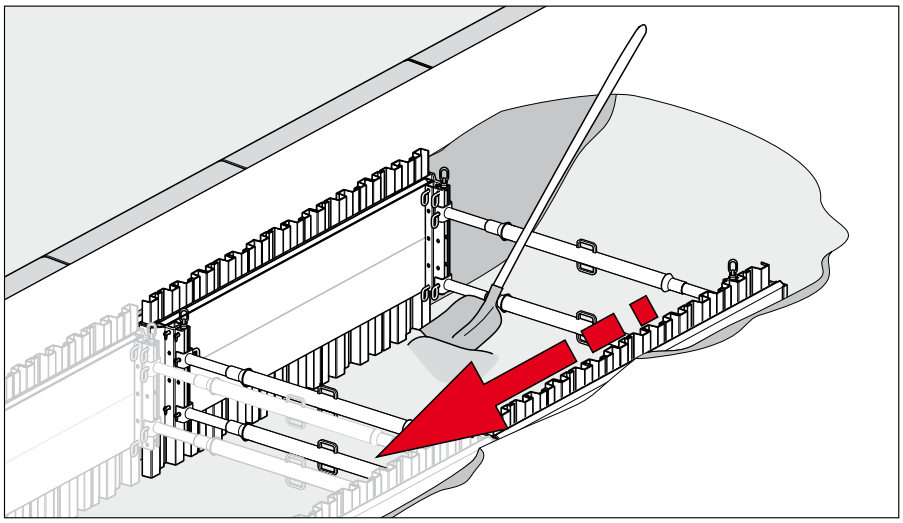


Fig. 17

Maximum depth of excavation

Maximum excavation depth:

- with 1.50 m long aluminium trench sheets: 1.50 m (embedment in base of trench is not necessary)
- with 2.50 m long aluminium trench sheets: 2.00 m (embedment in base of trench is not necessary)
- with 3.50 m long aluminium trench sheets: 3.00 m
  In trenches ≥ 2.00 m deep it is necessary to embed the aluminium trench sheets min. 0.40 m in the base of the trench.

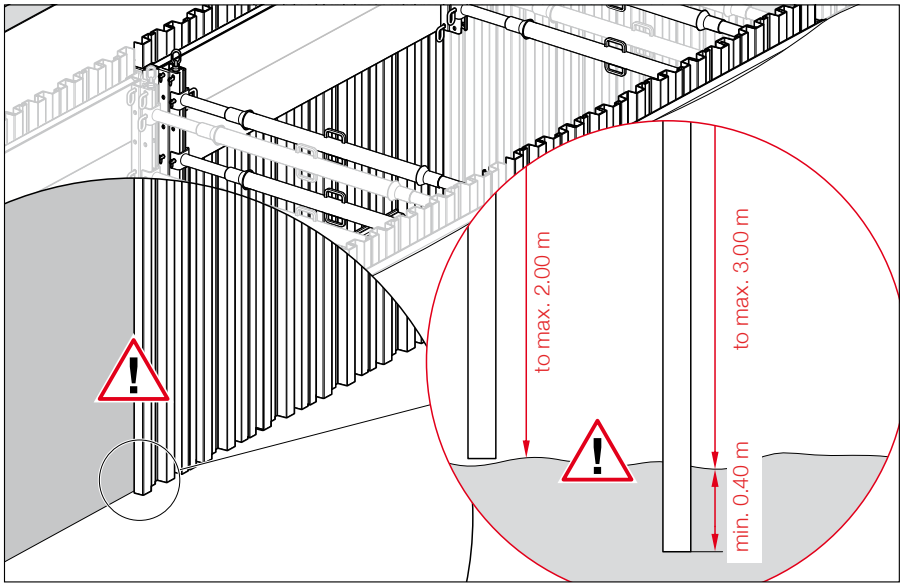


Fig. 18

6.4 Additional walers

Additional walers can be attached where services cross the trench or for deeper trenches or higher loads. (The stability must be verified in each case.)
To do this, the 1.35 m aluminium panel connector is fixed to the aluminium trench sheets using the clamp with R 12 x 50 mm connecting bolt ❾. Attach walers on both sides of the trench. Fit at least two struts between the panel connectors on both sides of the trench, secure these with standard connecting pins and then tighten the struts against the sides of the excavation.

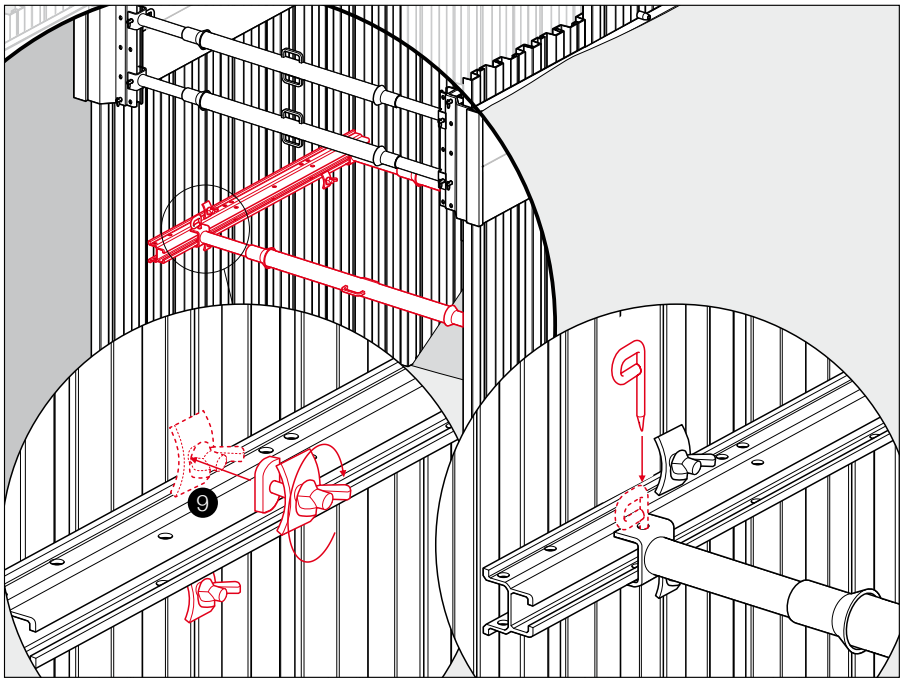


Fig. 19

Note
Attach a positioner 5 to prevent the aluminium trench sheets from slipping down into the trench.

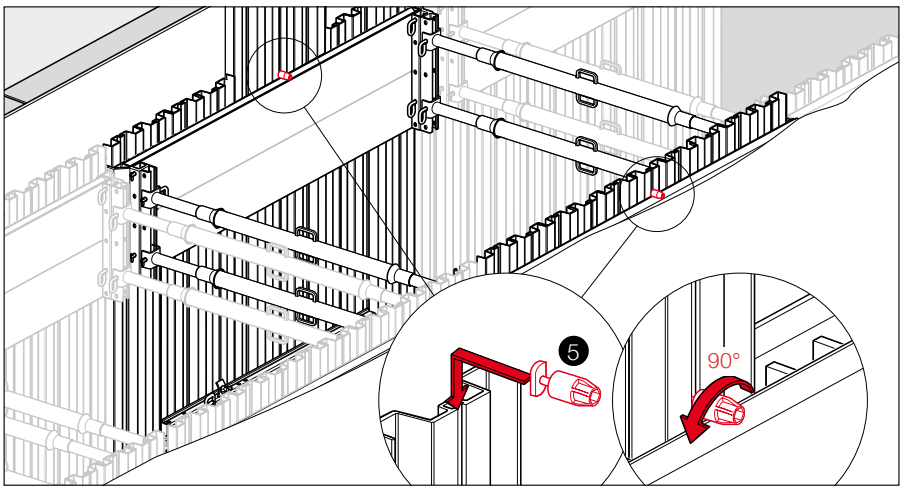


Fig. 20

6.5 Safety barrier alongside trench

To provide a temporary safety barrier alongside a trench, rail posts 16 can be attached to the aluminium Litebox panels directly or inserted into the holding arms 15. Fix suitable timber planks to the rail posts.

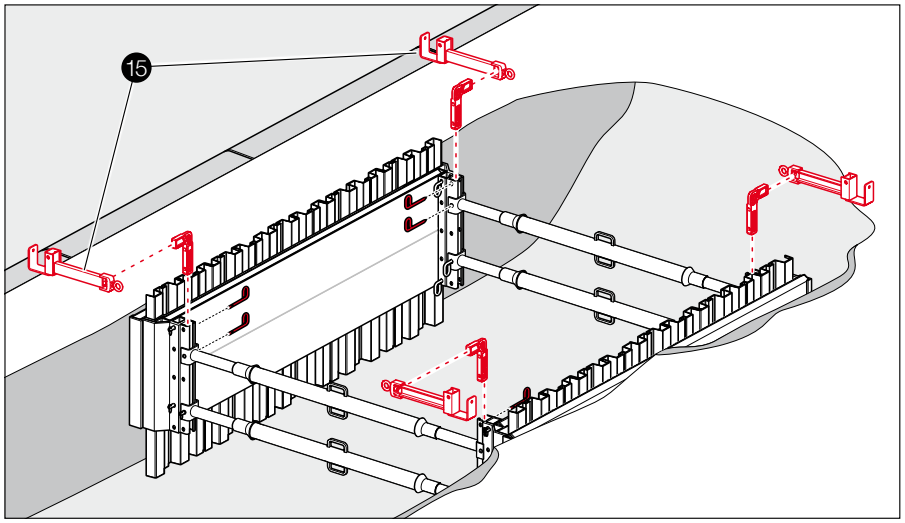


Fig. 21 | Example of edge secured with universal lifting eye and holding arm

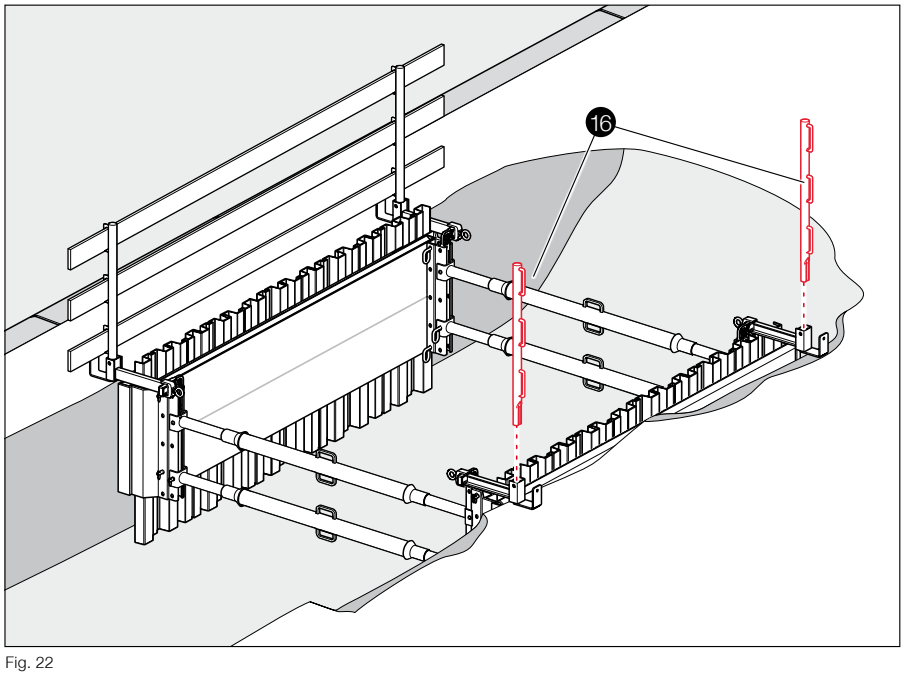


Fig. 22

7. Removal

7.1 Backfilling the trench

Backfill the trench with soil in layers and compact each layer.

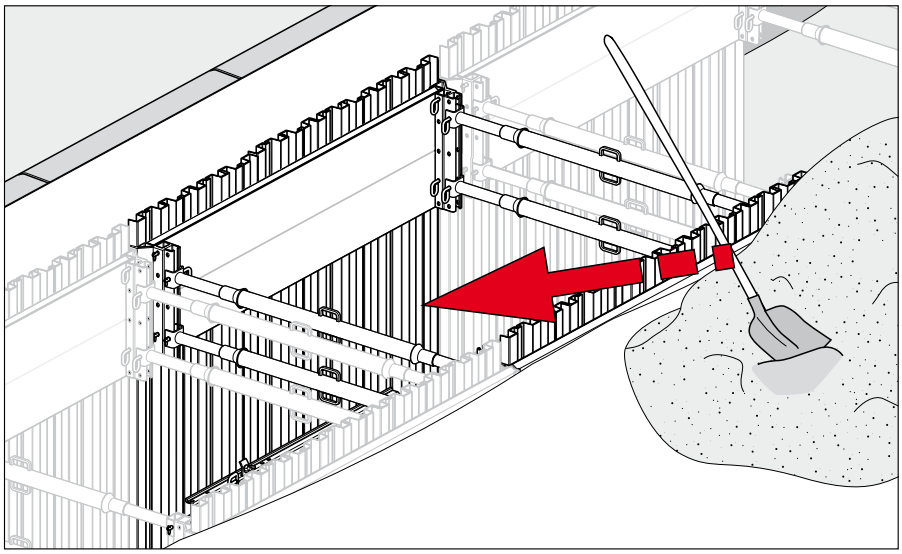


Fig. 23

7.2 Extracting the aluminium trench sheets

Extract the aluminium trench sheets from the ground with the help of a lifting clamp ❼. After releasing the trench struts, the trench box can be lifted out of the trench and dismantled.

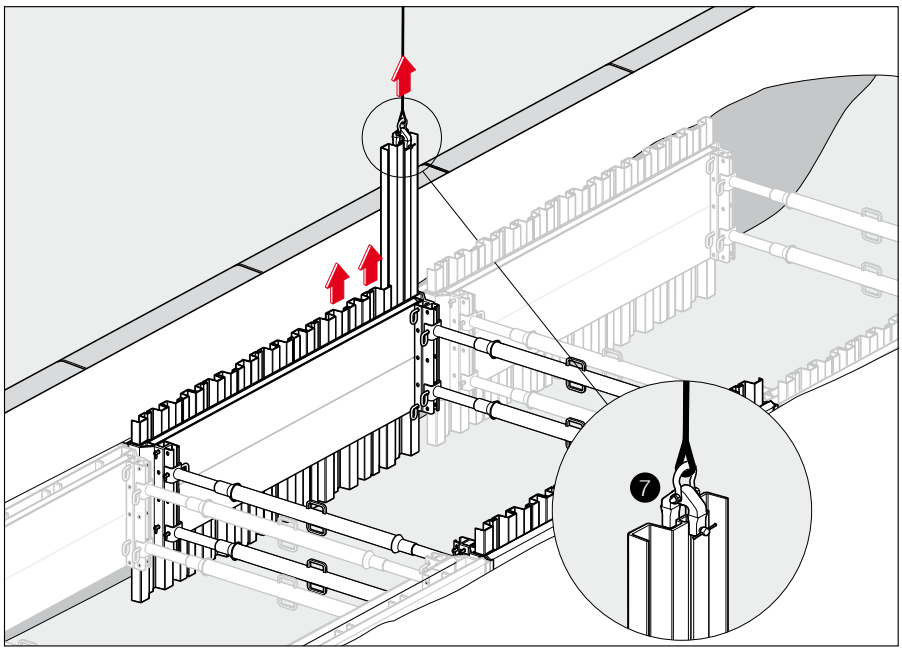


Fig. 24

8. Loading

The load on the aluminium trench shoring may not exceed e_d = 26 kN/m² (design value of earth pressure) or e_k = 175 kN/m² (characteristic value of earth pressure).

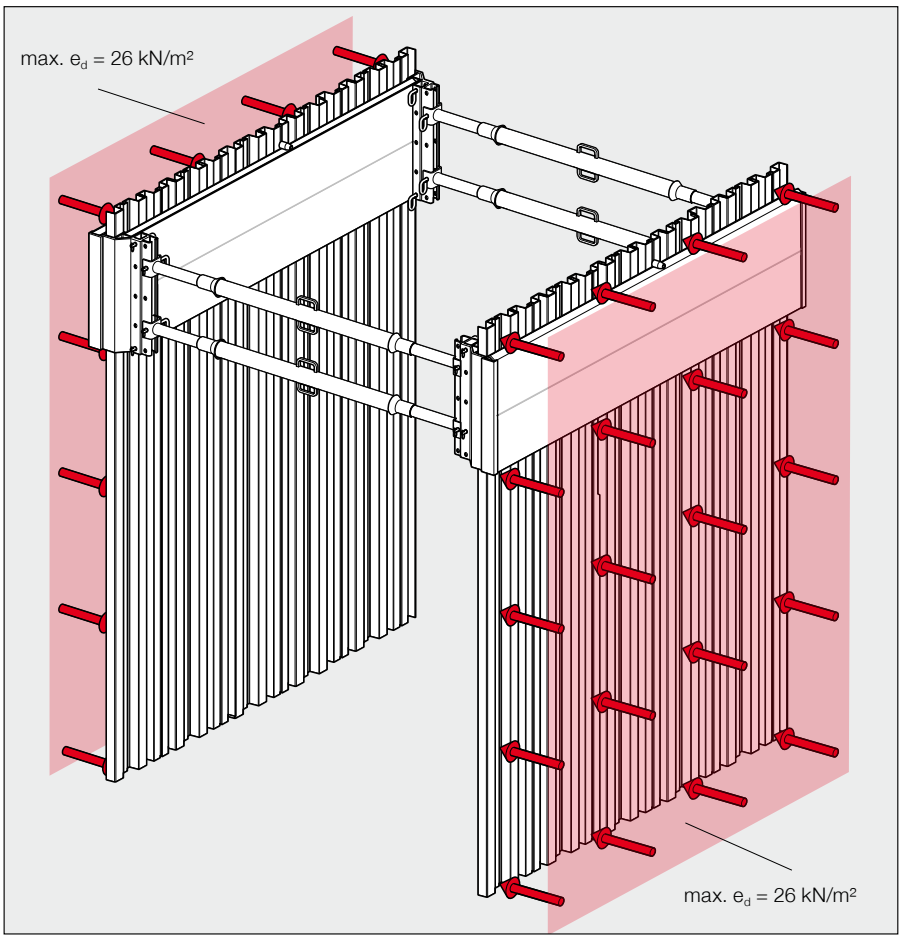


Fig. 25

9. Storage and transport

Check deliveries of components for completeness immediately upon arrival. The packaging units should be unloaded directly where they are to be used later.

- Only use components that are in good working order.
- Damaged components must be re-jected.
- Repairs may only be carried out by the manufacturer.
- All components must be properly secured to prevent movement during storage and transport.

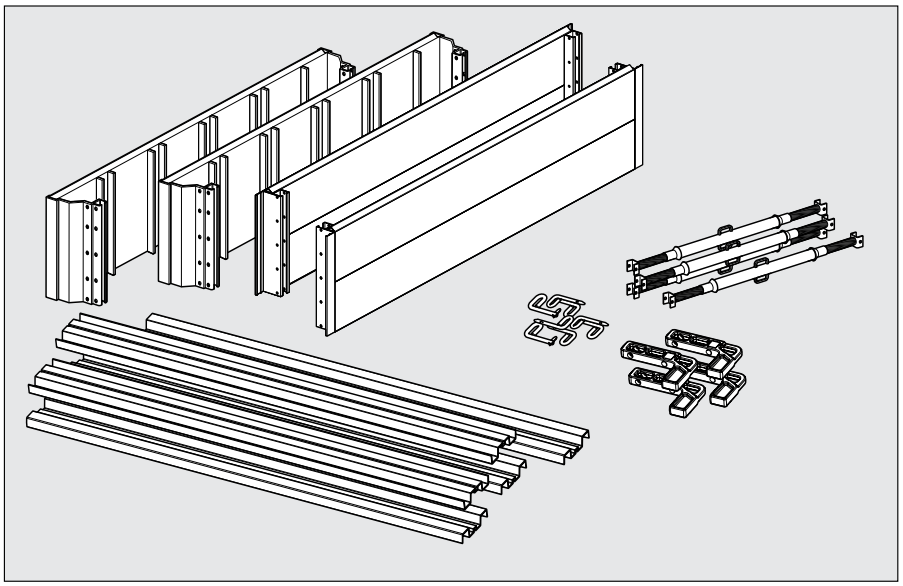


Fig. 26

10. Special excavation shoring solutions

Various arrangements are possible.

10.1 Shoring on one side only

In order to be able to work adjacent to the wall of a building, the trench shoring can be braced against the wall, e.g. with the help of an aluminium panel connector. Always check the load-carrying capacity of the wall first.

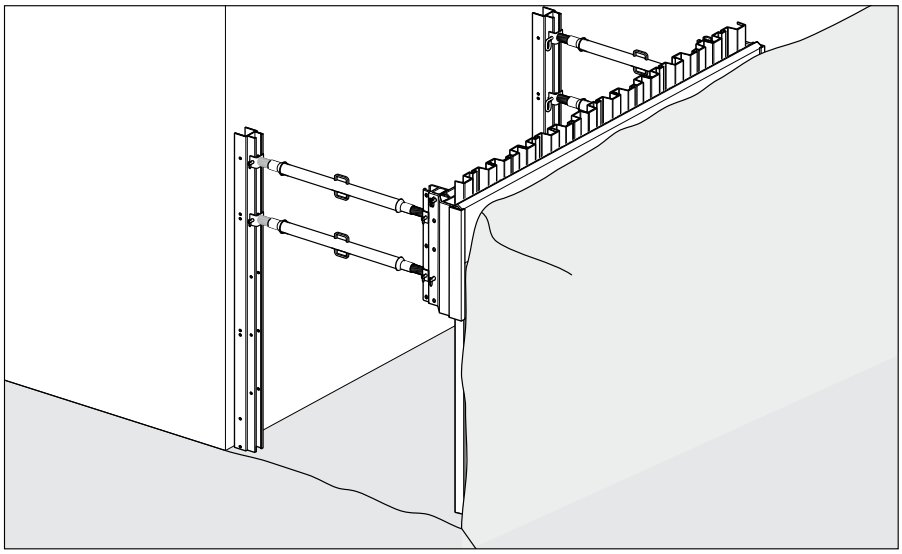


Fig. 27

10.2 Aluminium end-face shoring

The LITEBOX aluminium end-face shoring is used to secure the end faces of trenches. Our aluminium end-face shoring is a modular system that can be easily adapted to the width of the trench and covers the complete extension range of Gi-A trench struts. Suitable for use in max. 3 m deep trenches. Please follow the instructions for assembly and use of the LITEBOX aluminium end-face shoring.

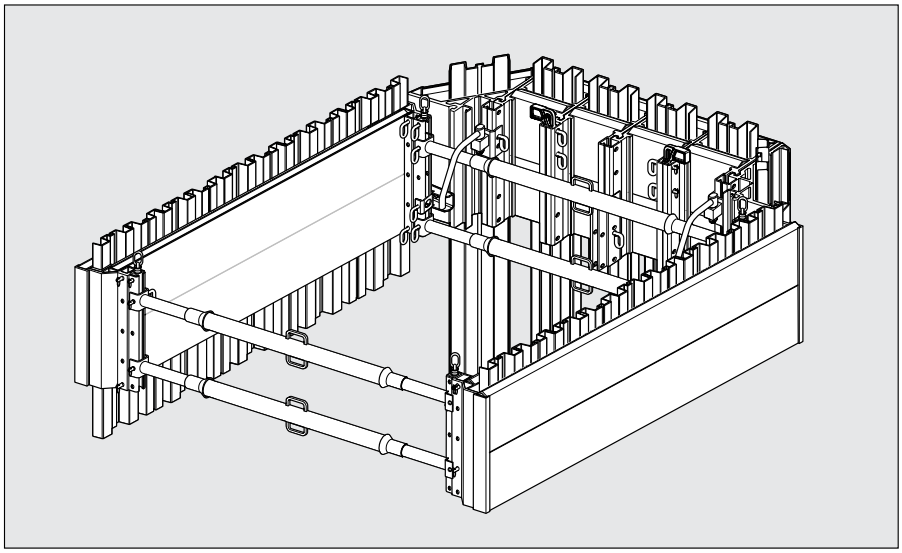


Fig. 28

10.3 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 connectors with RSK adapters. Trenches up to 6.85 m wide can be secured in this way.

*The permissible loads for push-pull props may not be exceeded.
Please refer to our TITAN push-pull props brochure for further information.

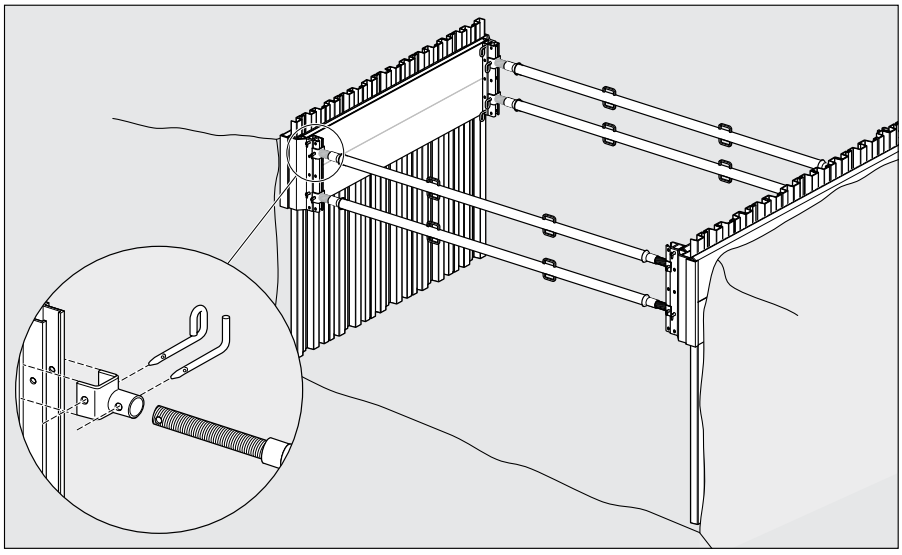
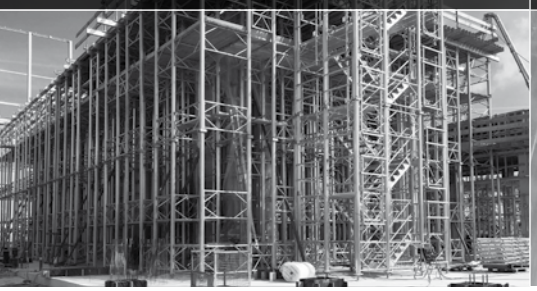
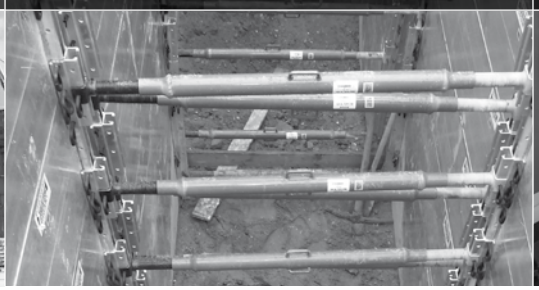


Fig. 29

Falsework and Formwork systems



Trench lining systems



Geotechnical solutions

Certified Management-System to DIN EN ISO 9001:2015

FRIEDR. ISCHEBECK GMBH
Managing Directors: Dipl.-Wi.-Ing. Björn Ischebeck, Dr. jur. Lars Ischebeck
Loher Str. 31-79 | 58256 Ennepetal | Germany | Phone +49 (2333) 8305-0 | Fax +49 (2333) 8305-55
E-mail: export@ischebeck.de | www.ischebeck.de

483.24.01.96.2/2007/July 2020