

PRODUCT USER GUIDE

DOUBLE SLIDE RAIL- New Zealand



Introduction

This booklet is intended to provide basic information for users of the Mabey Hire Ltd Double Slide Rail system and to draw the client's attention to the practical aspects of Double Slide Rail Shoring System operational procedures and basic maintenance which need to be considered when compiling method statements, and safe system of works. It is assumed that clients are familiar with general safe practices applicable to this type of work.

Double slide rails with 'rolling strut' remain parallel during the excavating and lowering procedure and consequently the shoring plates can be easily installed and extracted even in deep excavations. Soil movement outside the trench is minimized during the shoring process. The massive, single rolling strut offers optimum working room during all operation phases. This feature makes the system much easier to use than any other double slide rails on the market.

It is advisable, before commencing installation, to read the notes below and to become familiar with the procedures involved when using the Double Slide Rail Shoring.

IMPORTANT NOTES

All excavation work must be thoroughly planned before work commences on site to identify hazards and assess risk.

These instructions form guidance for the typical installation of Double Slide Rails. Non-standard applications should be approved by a suitably qualified engineer.

Ensure all personnel engaged in installation operations are properly briefed and adequately supervised by a competent person.

All hire for this equipment will usually be accompanied by a general arrangement or scheme specific drawing. This must be read in conjunction with these instructions.

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1. General notes

In line with TWF General Instructions

At formation level, the shoring shall rest on the ground and have no gaps for possible failure. 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 following rules and regulations have to be followed in their valid version:

- Regulations of the Technical for Committee Civil and Underground Engineering
- DIN 4124 excavation pits and trenches
- DIN EN 13331 part 1 & 2 construction equipment
- Rules for Safety and Health during Work
- accident prevention and safety at work rules

Our shoring components have the GS-Sign “Certified Safety“. During installation, the instructions in this operating manual have to be followed.

Lifting & Transporting

- The shoring may only be attached to 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 unnecessary swinging movements have to be avoided.
- It is forbidden to enter the swivel range of the lifting tool and to stand under suspended.
- It has to be paid attention to overhead contact lines.
- Engine driver and instructor must have face-to-face interaction.

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 at any case.

- Only original spare parts of TWF may be used.
- According to the intenseness of use, components should be painted with anti-corrosive paint every 2 years.

After Installation Works

Each excavation must be inspected daily before personnel begin work.

Return of Equipment Off-Hire

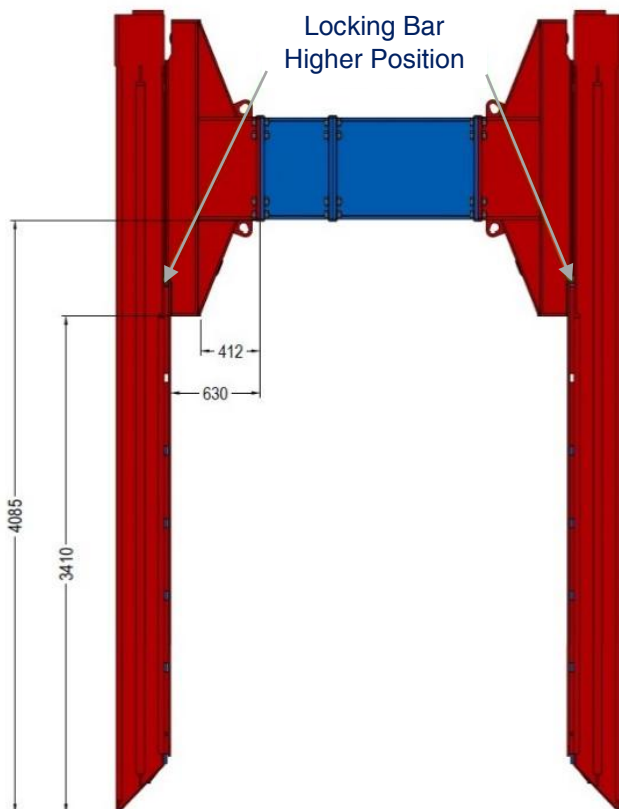
Clients should ensure that on removal, the equipment is returned clean and assembled as supplied.

Ensure all equipment is loaded to the satisfaction of the vehicle driver and is securely restrained to the vehicle bed.

2. Technical Description

Double Slide Rail shoring is a modular system made out of double- and corner slide bars, roller sliders and shoring-plates. This system is ideal for protecting low-lying infrastructure and buildings. It also provides temporary stability for trenches up to 6 meters deep. Key features include:

- ▶ The end-supported, slide rail guided shoring.
- ▶ For trench depths up to 5.50m without an extension rail.
- ▶ In plate lengths up to 6.00m.
- ▶ In plate heights of 2.40 m.
- ▶ In top plate heights of 1.40 m.
- ▶ For working widths up to 6.24 m with panels and 9.24m with struts.
- ▶ Under strut clearance of 3.40m and 4.0m.



2.1 Advantages

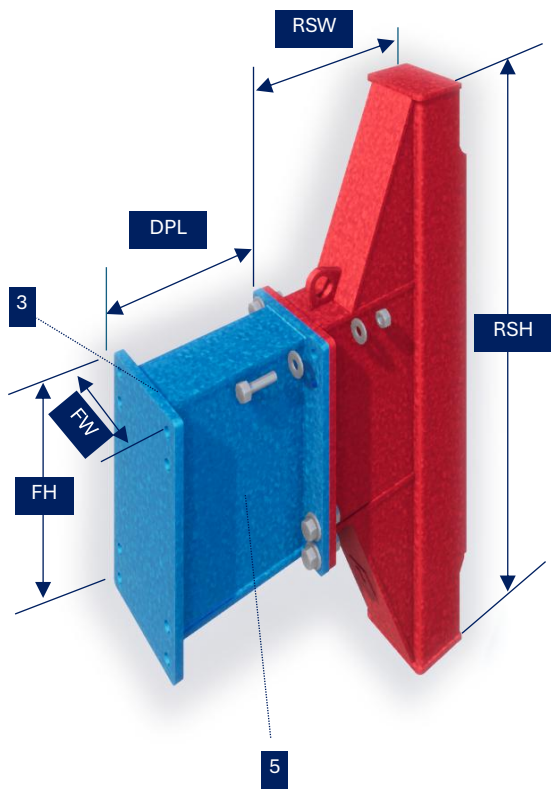
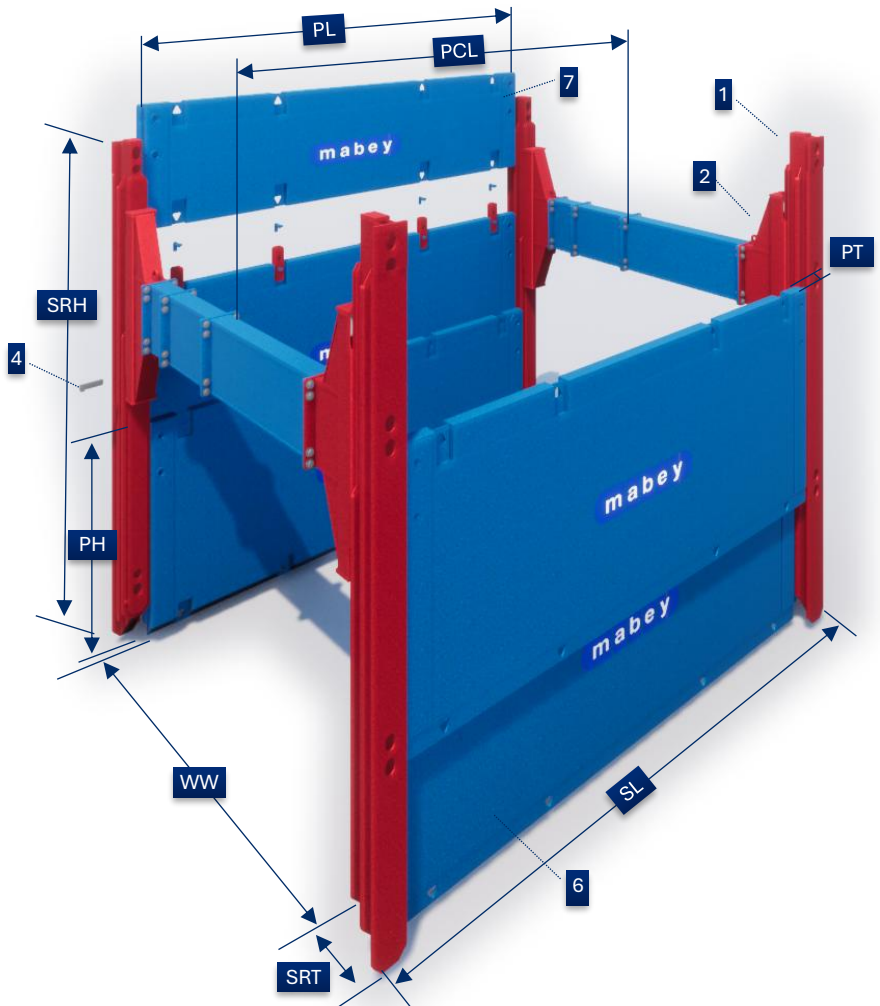
- ▶ Easy installation and re-installation, since plates, rails, and rolling struts can be positioned individually.
- ▶ Continuously variable adjustment of strut clearance heights- max.
- ▶ Robust distance pieces in 0.25, 0.50, 1.0 & 2.0m Upon request, we are pleased to manufacture special dimensions as well.
- ▶ Easy flange-mounting of the distance pieces with bolts M30 of quality 10.9.

3. Technical Parameters

3.1 Double Slide Rail Shoring Components

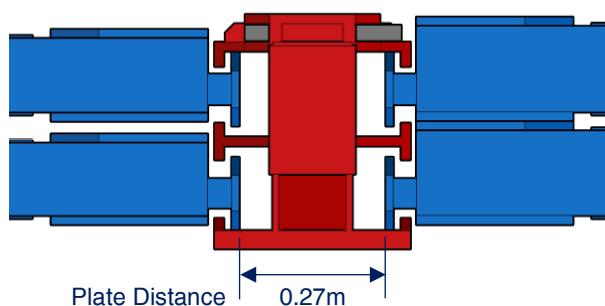
PL	Plate Length
SRH	Slide Rail Height
WW	Working width
SRT	Slide rail thickness
SL	System length
PH	Plate height
PT	Plate thickness
PCL	Pipe Clearance Length

1	Slide Rail
2	Rolling Strut
3	Distance piece
4	Limit pin
5	Bolting M30
6	Base plate
7	Top plate



RSH	Rolling Strut Height
RSW	Rolling Strut width
DPL	Distance Piece Length
FH	Flange Height
FW	Flange width

3.2 Slide Rail Plates



1	Base Plate
2	Top Plate
PL	Plate Length
PH	Plate Height
PT	Plate Thickness
PCL	Pipe Clearance Length
SL	System Length

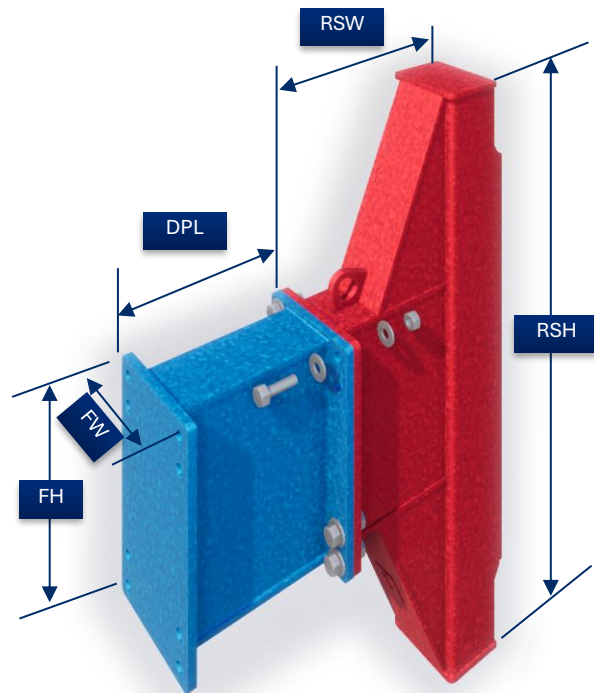
PLATE	Plate Length PL (m)	Plate Height PH (m)	Plate thicknessPT (mm)	PC-Length PCL (m)	System Length (m)	Allowed earth pressure(kN/m ²)	Weight (kg)
1	3.0	2.40	130	2.80	3.27	98	1461
2		1.40				108	881
1	4.0	2.40	130	3.80	4.27	67	1981
2		1.40				90	1195
1	5.0	2.40	150	4.80	5.27	77	2470
2		1.40				90	1536
1	6.0	2.40	150	5.80	6.27	63	3010
2		1.40				88	1865

3.3 Rolling Strut

Rolling Strut - Standard	
Height RSH (m)	2.04
Width RSW (m)	0.50
Flange width FW (mm)	405
Flange height FH (mm)	720
Weight / RS-pair (kg)	980
Min. Working Width WW (m)	1.24

Length DPL (m)	0.25	0.50	1.00	2.00
Weight (kg)	163	201	277	437

- Max. allowable eccentric bending moment on short extension: 423 kNm.
- Rolling strut permissible force: +805 kN (C) ; -143 kN (T).



3.4 Slide Rail- Double Slide Rail Shoring Post



Element	Length GSH (m)	Weight (kg)	Slide Rail Size GSS (mm)	Allowable Bending Moment
Slide Rail	5.50	1164	375	949.2 kNm
Corner Slide Rail	5.50	957	430	130.9* kN/m

SRH	Slide rail height
SRT	Slide rail thickness
(A)	Base rail
(B)	Corner base rail

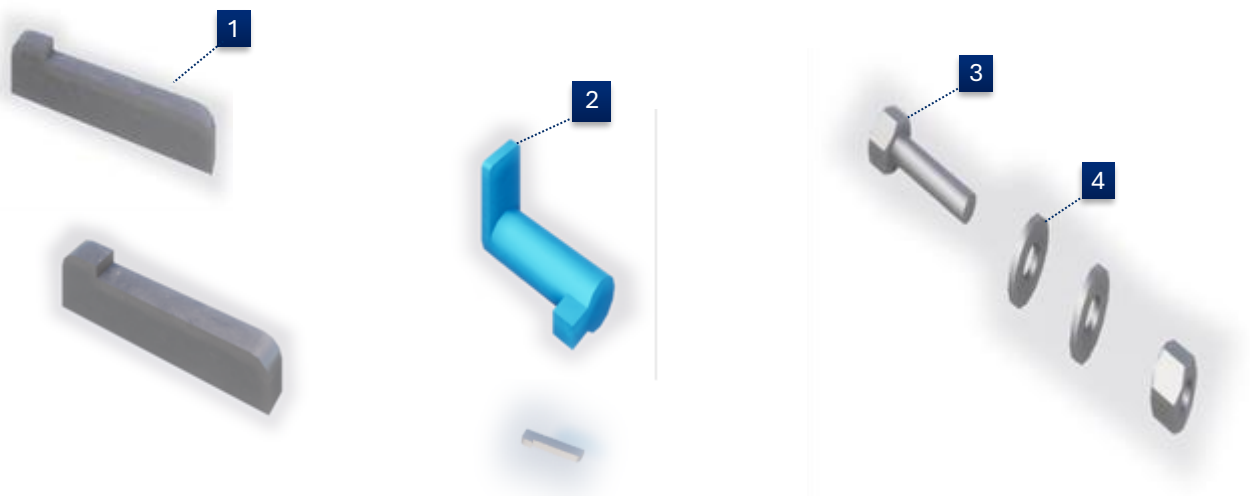
(A)

Allowable moment: 728kNm
Allowable Shear: 966 kNm

(B)

Allowable moment: 289 kNm
Allowable Shear: 2753 kNm

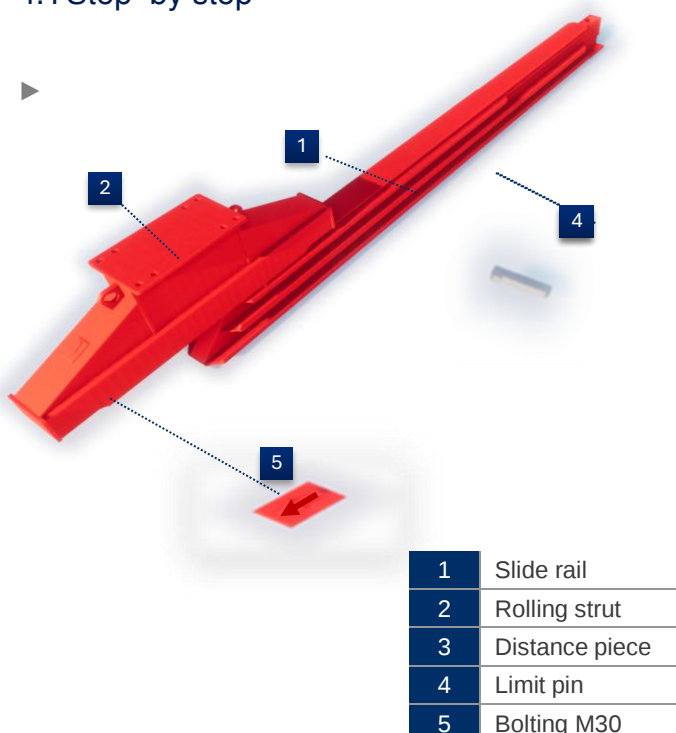
3.5 Accessories



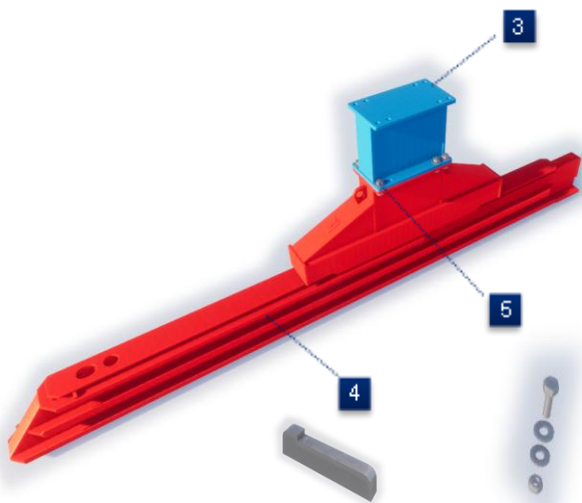
	Description	Use for	Component height	Dimension (mm)	Weight (kg)
1	Limit pin	Locking	375	25*70*260	3.0
			405	37*50*260	3.0
2	Pin	Top Plate	up to 130	Ø40 * 140	1.5
3	6sq bolt	Flange	t = 25	M30*90	0.96
			t = 25	M30*100	1.01
4	Washer	Flange		A33	0.1

4. Struts Frame Assembly Instructions

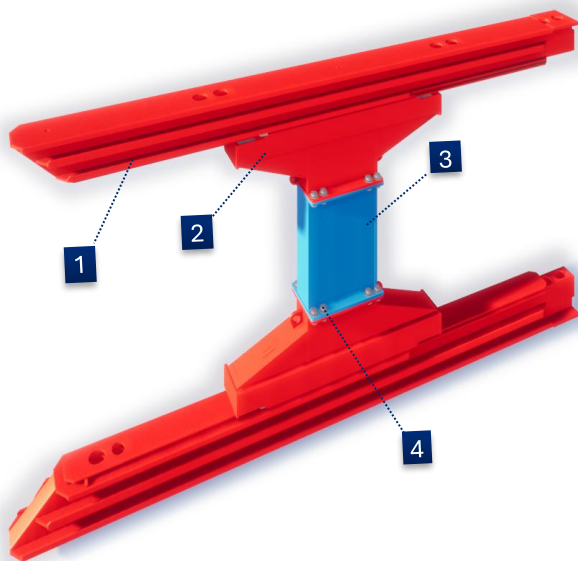
4.1 Step by step



- ▶ **Place the rail with the guiding profile upwards onto flat and firm ground.** Position the lower limit pin, with the locking pin downward (in opposition to the rolling strut).
- ▶ To allow for the A-position, **install the rolling strut with the arrow upwards according to the drawing.**
- ▶ **Place the lower castor of the rolling strut onto the guiding profile** of the rail and slide carefully up to the top of the rail, until it reaches the lower limit pin.
- ▶ **Above the rolling strut, another limit pin is positioned,** with the locking pin upwards (in opposition to the rolling strut). Now the rolling strut is locked in the middle of the rail and cannot be moved any longer. The assembly of the further rolling struts is done the same way.
- ▶ **Important:** The locking pin of the limit pin must always be turned away from the rolling strut.

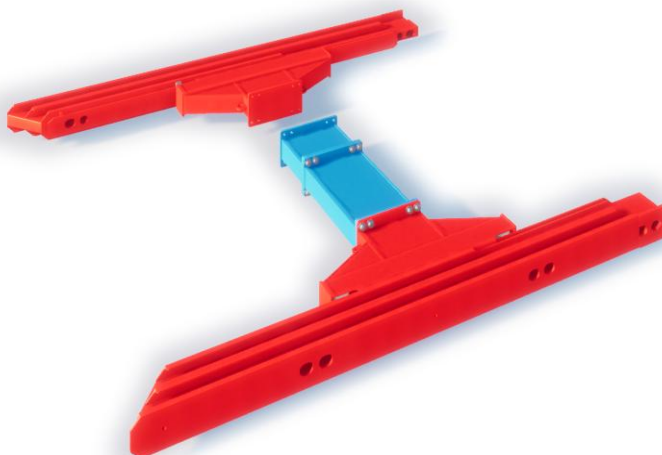


- ▶ When using distance pieces, attach them to the eyes intended for this purpose, place them from above onto the flange plate of the rolling strut and join with bolts M30 of quality 10.9
- ▶ If several distance pieces are needed to achieve the required working width, they are assembled on the ground in advance and later flanged on the rolling strut as described before
- ▶ Put one washer under the bolt head and one washer.
- ▶ Turn the bolts crosswise with a torque of 1350 Nm under the nut.
- ▶ During the assembly, the distance piece rests in its hooked position.



- ▶ The slide rail, pre-assembled with distance pieces, can now be put down. After hooking the chain into the assembly openings at the back of the slide rail, the rail with the flanged distance pieces is lifted and moved over the flange plate of the rail on the ground, which is pre-assembled with the rolling strut.
- ▶ The alignment of the flange plates can be done without difficulty since the slide rail rests hooked in during assembly.
- ▶ The components are bolted together as described before.
- ▶ Now we have a slide rail frame that can be put down.
- ▶ The assembly of the further frames is done the same way.

1	Slide Rail
2	Rolling Strut
3	Distance Piece
4	Bolting M30

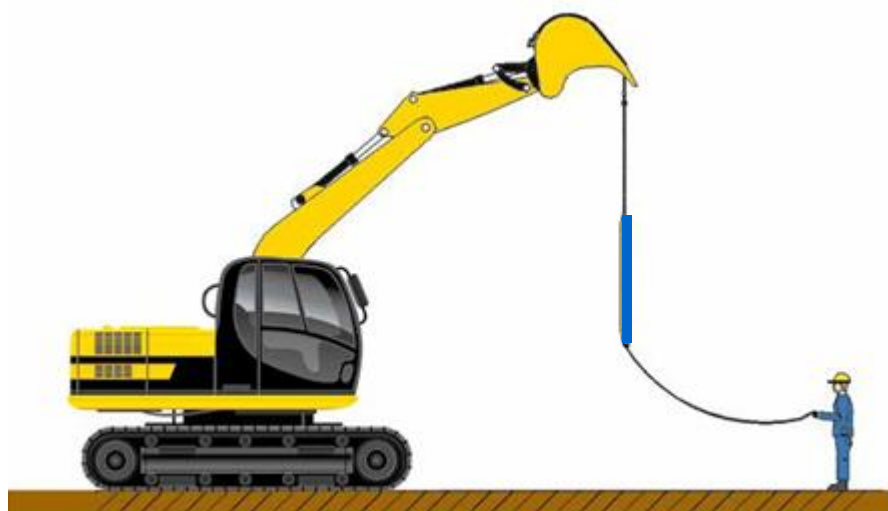


For Safety Reasons, the assembly of the Slide Rail frame must be performed on the ground when having working widths over 2.0m. Thereby, the Slide Rail, pre-assembled with rolling struts and distance pieces, are put down oppositely, aligned and bolted. Another possibility is the use of assembly helps

5. Shoring Installation Instructions

5.1 Alignment of the initial shoring bay

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.



Allowed Tensile Forces

At the single attachment point the following tensile forces can be supported:

Slide Rail

per lifting eye = 196 kN
per guiding profile opening = 164 kN

Plates

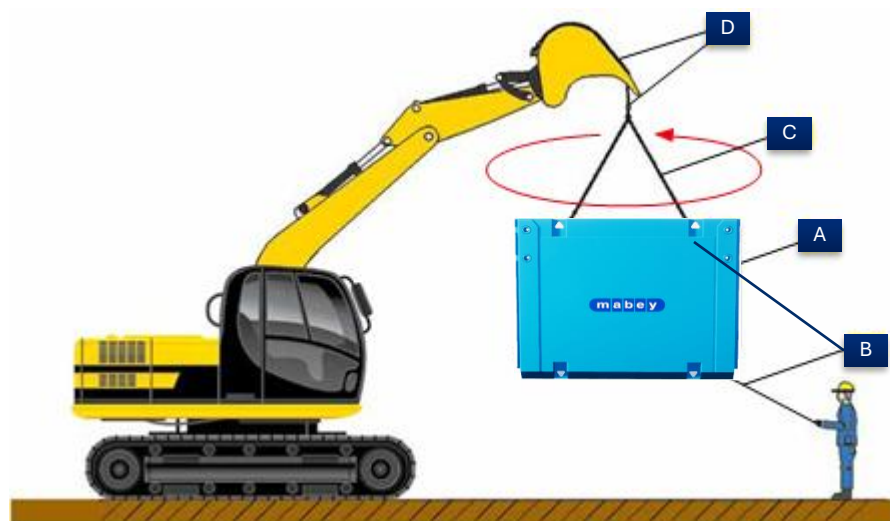
per lifting eye = 196 kN
per eye at cutting edge = 49 kN

Rolling Strut

per lifting eye = 164 kN

Distance Piece

per hooking eye = 49 kN

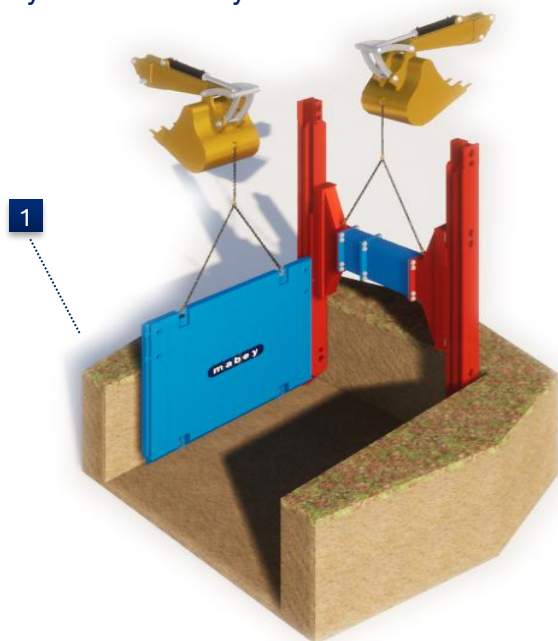


A	Shoring Plate
B	Rope
C	1-Fold-chain
D	2-Fold-chain

5.2 Handling of slide rails plates

For the transportation of slide rail plates, it is recommended to use a **combination of a single-leg** (1-fold) and **a double-leg** (2-fold) lifting chain. The **1-fold chain** should be attached to a suitable lifting point on the excavator's bucket. The chain length must be selected so that the ring of the fold chain remains positioned directly beneath the bucket, regardless of the bucket's movement. This setup allows the slide rail plate to be easily and safely rotated into the required position without the risk of the plate tipping or swinging uncontrollably. Important: The excavator must remain stationary while the plate is being turned.

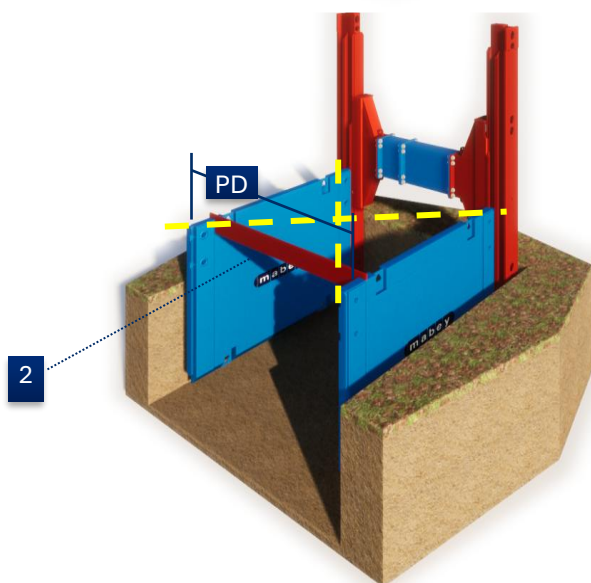
5.3 System Assembly



1. Place the base plate into the pre-excavated trench, push in, and secure with the boom of the first excavator. The pre-assembled slide rail frame is picked up by the second excavator, which must have an appropriate lift, swung over the shoring plate into the pre-excavated trench, mounted into the outer guidance and pushed in

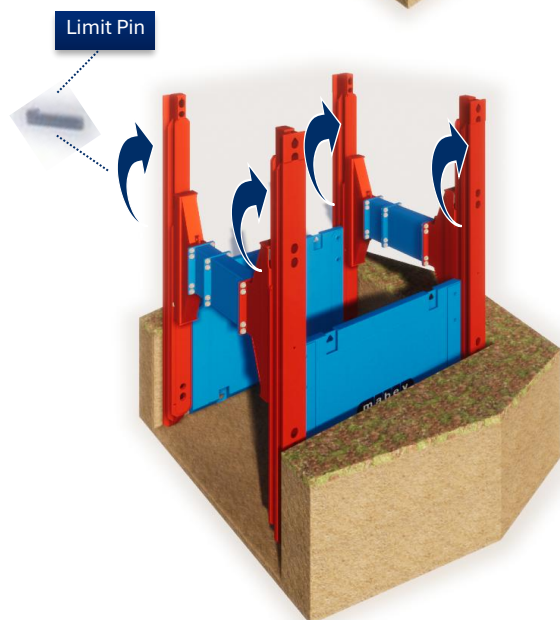
At this stage, the trench must not be entered

Mount the second shoring plate in the outer guidance of the slide rail and lower up to the trench bottom.



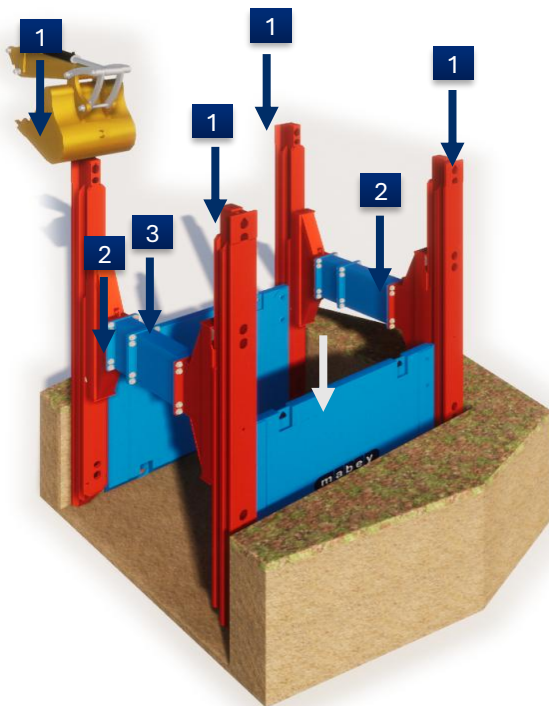
1	Base plate
2	Assembly help
PD	Plate distance

2. Align parallel and over the diagonal rectangular the two shoring plates using spacer / assembly helps.



3. Now the second pre-assembled slide rail frame is guided over two plate guideline and pushed into the soil. Push in slide rails and plates and align if required. Fill in and compact the excavation between shoring and soil!

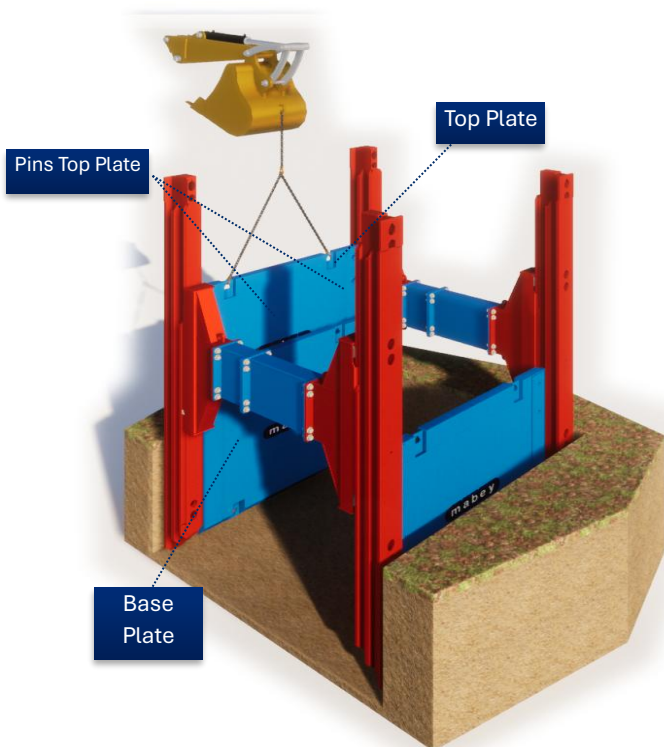
3.1 The upper limit pins must now be repositioned – as illustrated. The rolling strut pair can now be moved on the slide rails and thus allows the function of the Rolling Strut Shoring. By positioning the limit pin into the upper hole, an unintentional slipping of the rolling strut is avoided during the lowering of the shoring.



4. Excavate about another 50 cm and push in by turns slide rails, rolling struts and shoring plates. It has to be paid attention that the plates do not project the slide rails below, that all components are pushed in by about the same lift, and that the rolling strut is positioned as much as possible in the middle of the slide rail frame.

Sequence:

1. Post
2. Strut
3. Panel



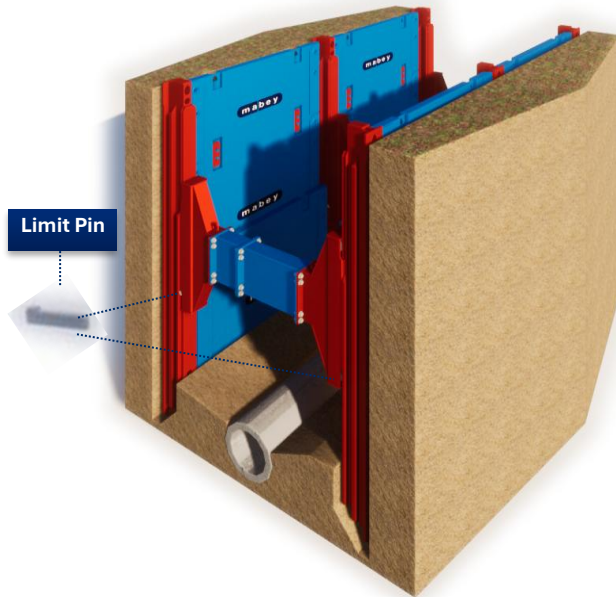
5. When the top edge of the externally guided plate reaches the top ground surface, the system can be extended if required by using a top plate or by mounting another base plate in the inner guidance of the slide rail.

When using top plates, it has to be made sure that they will be connected with the base plates using pins.

5.1 Lower the inner guided plate down to the excavation bottom. The lowering step-by-step, whereupon slide rails, rolling struts and inner plates are pushed down, is repeated until reaching the final trench bottom.

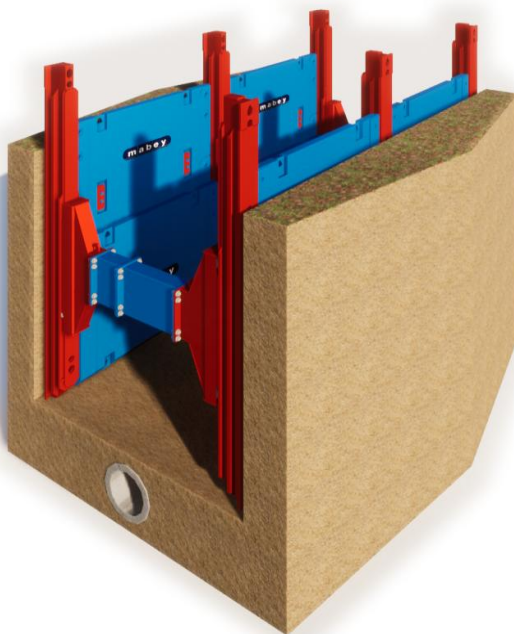
The top edge of the shoring must overtop the surrounding terrain by at least 5 cm!

6. Shoring Re-Installation



1. At the beginning of the re-installation, **remove the lower limit Pin at the rolling Strut.**

According to the compacting possibilities, fill in 500mm backfill max.



3. Raise the shoring components to the filled height, then compact the backfill.

- Repeat this procedure as described until the shoring can be lifted out of the trench in consideration of the safety instructions.
- Use the designated lifting eyes only for lifting the shoring components.

We advise expressly that it is forbidden to enter the danger area during the installation and also during the reinstallation.

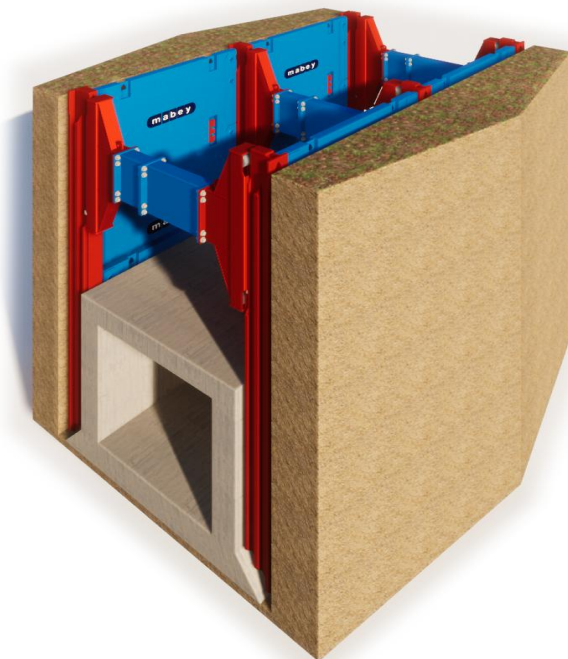
7. Bottom Support



1. For great strut clearance heights and/or in-situ concrete projects it is often required for statical reasons to brace the slide rail in the trench bottom.

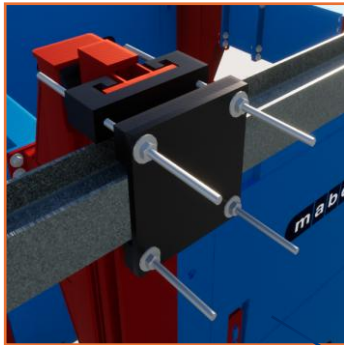
In doing so, the shoring is installed up to the trench bottom according to the installation guidelines. In this phase, the rolling strut should be positioned centrally.

According to the statical demands, a steel beam or a concrete slab is placed in the trench bottom. Thereby it has to be paid attention that the steel beam is seated superficially between the guidance of the slide rail frame.



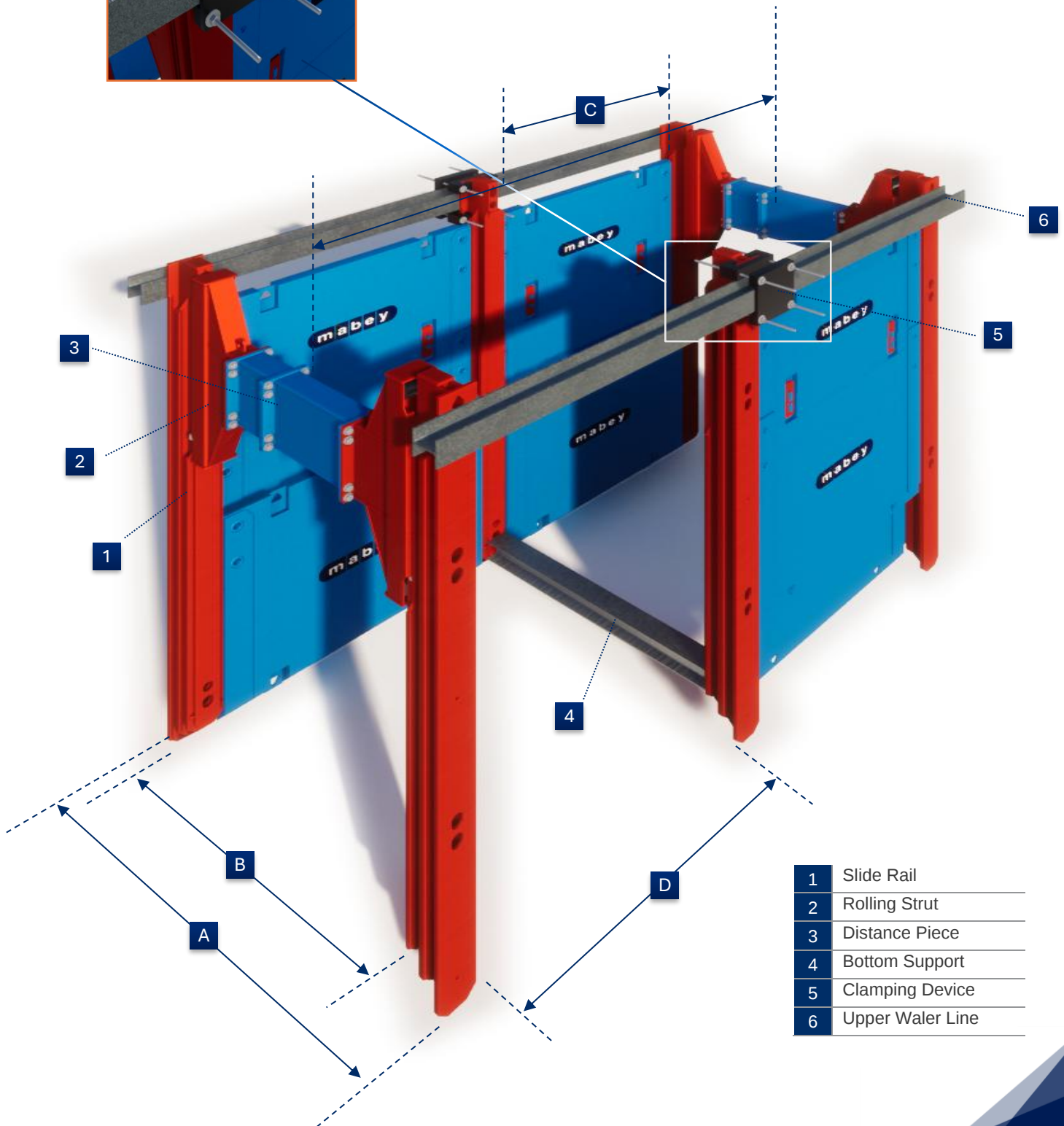
2. After placing the bottom support and respectively hardening the concrete slab, the rolling strut can be lifted up to the highest limit pin in the slide rail and fixed below using the limit pin.

8. Adjustable Clamping Device



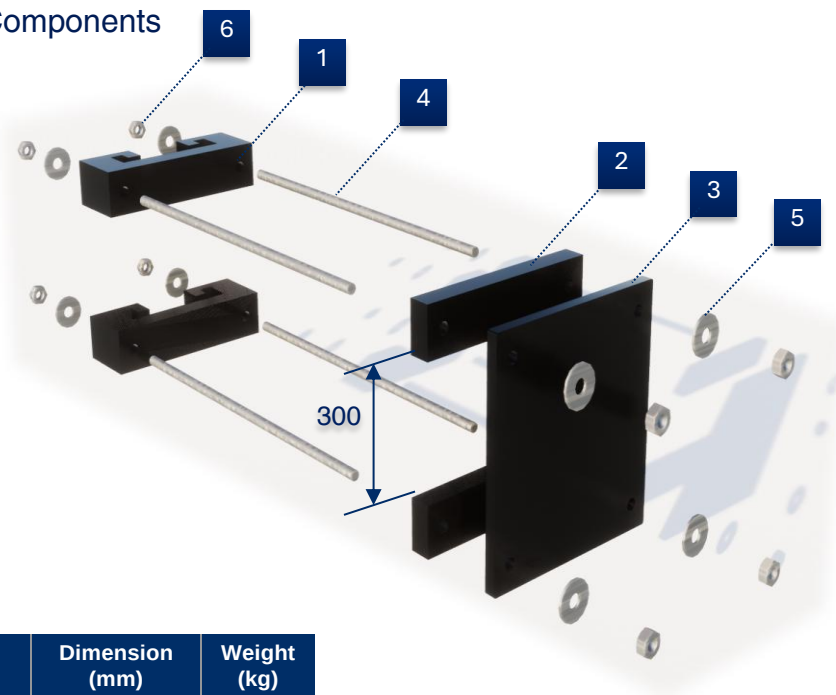
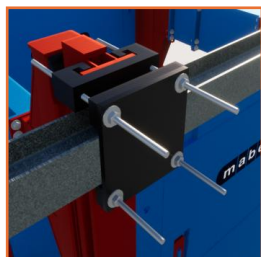
Max. 4.2m Trench
Depth for 5.5m length
rails.

A	Trench Width
B	Working Width
C	Plate Length
D	System Length
E	Strut Clearance



1	Slide Rail
2	Rolling Strut
3	Distance Piece
4	Bottom Support
5	Clamping Device
6	Upper Water Line

8.1. Adjustable Clamping Components



	Description	Use for	Dimension (mm)	Weight (kg)
1	Socket	Locking	120*180*520	61,3
2	Lug	Extension Rail	60*120*520	29,4
3	Flange plate	Top Plate	30*555*520	68,0
4	Threaded rod	Flange	Ø26,5 * 1000	4,50
5	Washer	Flange	Di = 31	0,05
6	6-squared nut	Rail	26.5	0,54

Strut-free pits, e.g. for the laying of long pipes, for building a structure, or for placing a press drilling machine can be realized with the adjustable clamping device.

Once the clamping device is assembled, one or more rolling struts can be removed. The slide rail frames, which need to be free of struts afterward, should be approximately 1.35 meters longer than the required trench depth. This additional length is necessary for the bottom support at the end of the slide rail and for securing the clamping device above the trench.

The clamping device engages behind the outer rail guidance and clamps the outside horizontal upper waler. The upper forces, passed in by the slide rail, are transferred over the outer waler to the corner slide rails.

8.2 Adjustable Clamping Installation Instructions

After installing the rolling strut shoring and bracing the slide rail frames in the trench bottom (bottom support), the clamping device can be assembled above the trench.

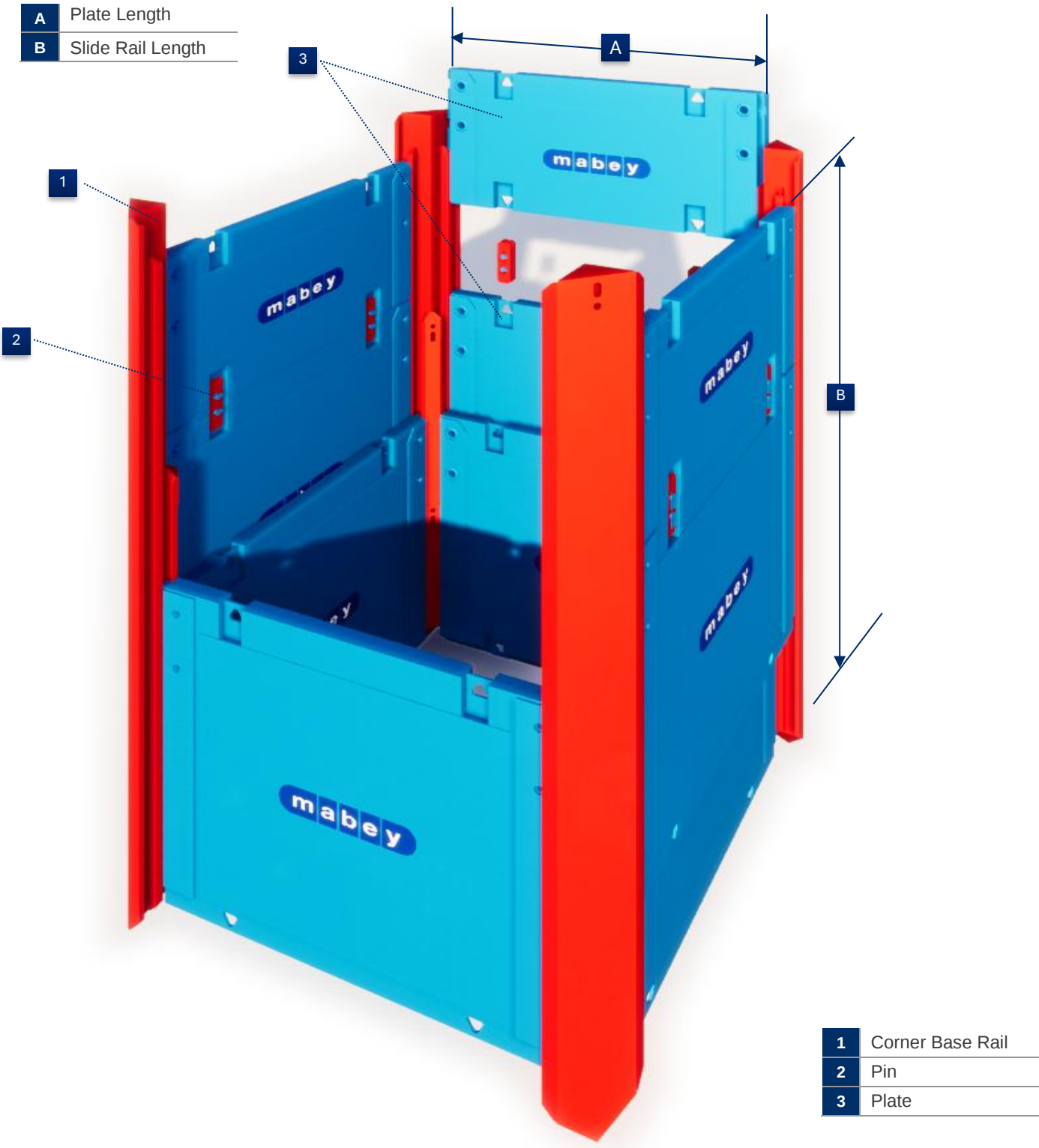
Therefore, the lower socket which is pre-assembled with threaded rods is moved over the rail guidance and put down on the top ground surface. The lower lug keeps the two threaded rods at bay and serves also as the lining of the upper waler. More linings, distributed over the length of the waler, can be made up of square-shaped timber for example.

The dimensioning of the waler acts by the statical requirements, whereas also 2 walers can be placed back-to-back.

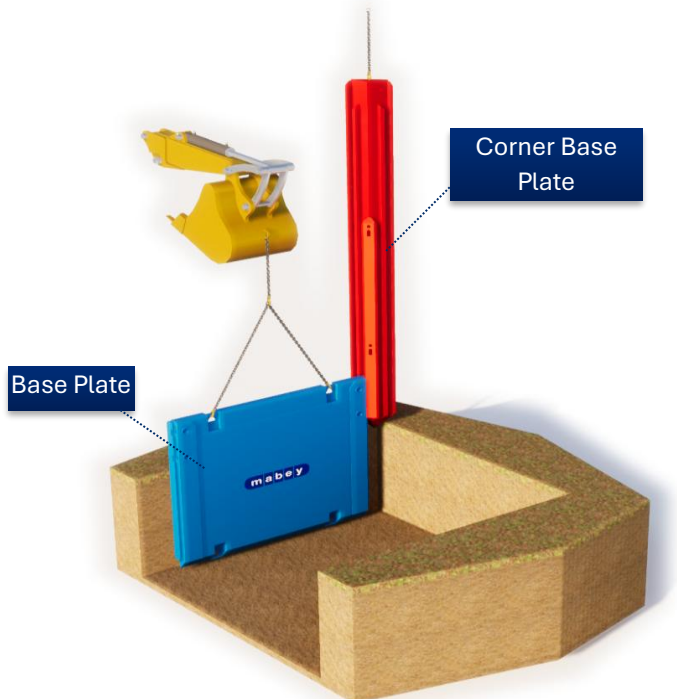
Behind the slide rail, the waler is put down on the socket and lug. The upper socket, pre-assembled with threaded rods, is also moved with the slide rail guidance, fit with the lugs, and put down on the waler. Move the flange plate over the 4 threaded rods and torque with the washers and nuts.

Now the upper limit pins in the slide rail frames can be removed and the rolling struts can be dismantled.

9. Shaft and Manhole Shoring



9.1 Shaft and Manhole Installation Instructions:

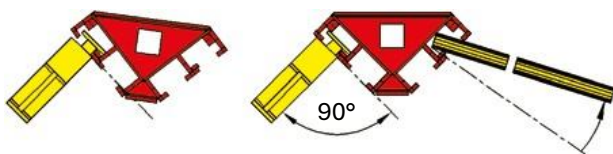


1. Pre-excavation of 1,25 m max. and approx. 10 cm wider than the pit will be. In principle, the pre-excavation complies with the type of soil and safety regulations

Place the first base plate in the pre-excavated trench, push in, and secure against canting over.

1.1 The first corner slide rail is picked up by the excavator, which must have an appropriate lift, then swung over the plate, mounted in the outer guidance (side of the ground), and lowered.

In this phase, the trench may not be entered. Align the corner slide rail and push in.



2. Mount the second plate in the free outer guidance of the rail and align it rectangularly. Now the second corner slide rail is moved over the plate guidance, aligned, and pushed into the soil

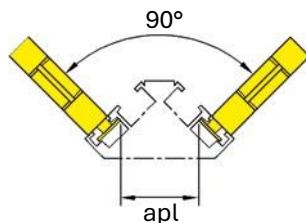
The further installation is executed as described before.



3. After installing the fourth plate, the free guidance of the first and of the last plate have to be aligned, that way the last corner slide rail can be mounted over both plate guidance.

The Ideal distance between the guidance (apl) is 35 cm

The pit is now completely assembled with the outer plates and if required can be aligned diagonally.



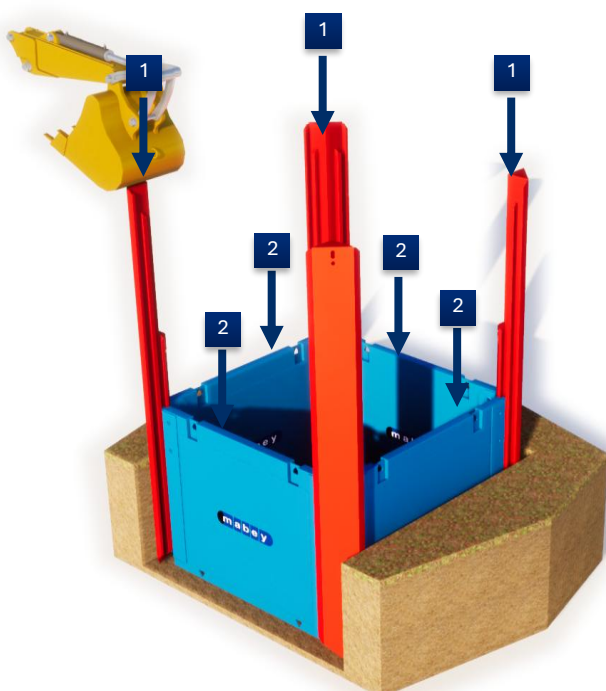
4. Pre-excavate another 50 cm and push in the rails and plates by turns.

It is important to ensure that the plates do not reach beyond the slide rails by more than 50 cm.

5. Fill in and compact the excavation between shoring and soil!

To protect the shoring plates and to ensure a long-life cycle we recommend the use of protection rails. Then the single shoring components have to be pushed in and not battered.

When the top edge of the plate reaches the ground surface, the system can be extended, if necessary, by adding a top plate or by installing another base plate in the inner guidance of the slide rail. If using top plates, ensure they are connected to the base plates with pins.



6. Lower the inner guided plate down to the bottom of the excavation. *This step-by-step lowering process*, during which the slide rails, rolling struts, and inner plates are pushed down, should be repeated until the final trench bottom is reached.

The top edge of the shoring must extend at least 5 cm above the surrounding terrain!

While information in this Guide is correct at time of printing, product specifications and product availability are subject to change without further notice. Please visit our website for the most up to date information. Job site photos are strictly intended for general product illustration only and may not comply with all applicable safety standards or site requirements. Specification data has been taken from manufacturers' serialised specific tabulated data.

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