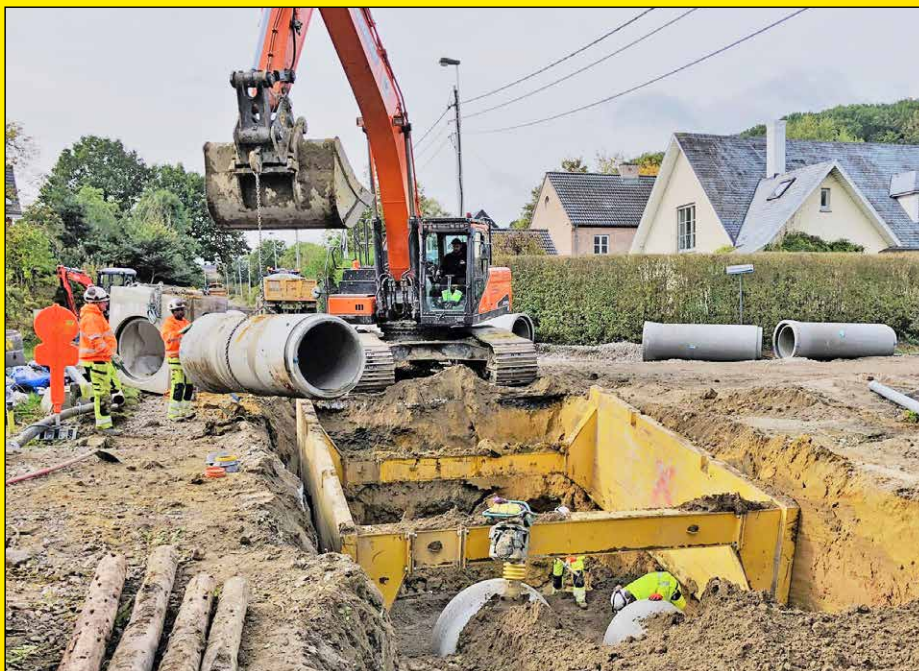


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DRAG BOX TYPE 650

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OPERATING MANUAL

► TWF - Drag Box Type 650

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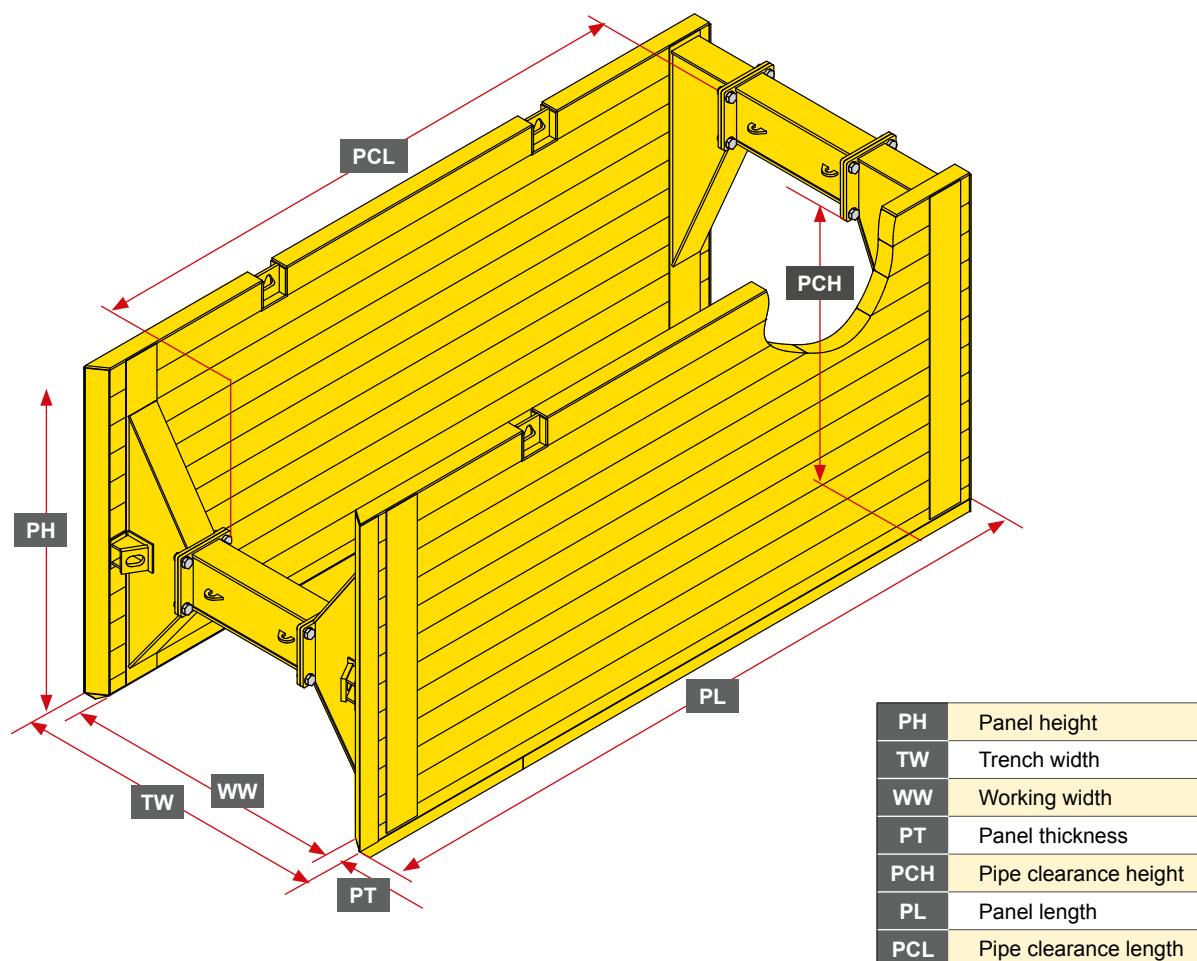


► TWF - Drag Box Type 650

■ System illustration

Technical description

- To be used for **underground pipeline construction** in stable soils
- **Secures** only a small section for the laying of the pipes
- The **front and back ends** remain unshored and must be **sloped**
- Tracked excavator: **30 - 50 t**
- Maximum trench depth: **2.40 m**
- Trench width: **1.26– 2.26 m**
- Pipe clearance height: **1.57 m**





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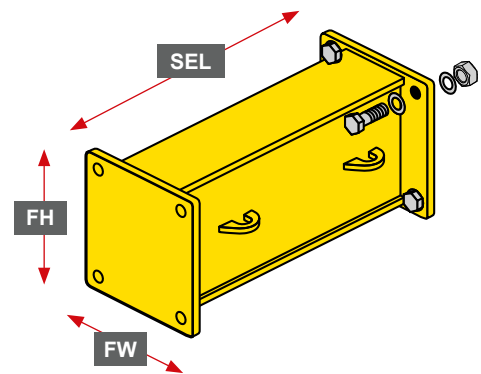
Plate length PL (m)	Plate height PH (m)	Plate thickness PT (mm)	PC length PCL (m)	PC height PCH (m)	Char. system resistance R (kN/m ²)	Weight per box without strut extension (kg/box)
4.00	2.40	120	2.99	1.57	59	2887
4.50	2.40	120	3.49	1.57	51	3123
5.00	2.40	120	3.99	1.57	44	3363
5.50	2.40	120	4.49	1.57	36	3603

* The characteristic system resistance refers to the specified PC heights

► Customised lengths and heights are available on request!

■ Strut extension

Strut extension length SEL (m)	Weight (kg) with 420 x 405 flange	Working width WW (m)	Trench width TW (m)
-	-	1.01	1.26
0.25	90	1.26	1.51
0.50	122	1.51	1.76
0.75	157	1.76	2.01
1.00	189	2.01	2.26
2.00	315	3.01	3.26



Bezeichnung	Verwendung für	Maße (mm)	Gewicht Kg / Stk.
Bolt	Flange	M30 x 90	0.96
Nut	Flange	M30	0.24
Washer	Flange	A31	0.05

SEL	Strut extension length
FH	Flange height
FW	Flange width

09-2023



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■ General instructions

Maximum loads must not be exceeded. The front and back ends of the trench must be sloped at an appropriate angle that is based on the soil conditions.

The current versions of the following rules and regulations must be adhered to:

- Regulations of the BG-Fachausschuss Tiefbau (technical committee civil and underground engineering)
- DIN 4124 Excavations and trenches
- DIN 1054 Subsoil - Verification of the safety of earthworks and foundations
- DIN EN 13331 Parts 1 & 2 Trench lining systems
- Occupational health and safety regulations
- German Social Accident Insurance (DGUV) regulations of BG BAU (the statutory accident insurance institution for the construction sector) - Section 28 Securing against mass movement
- Accident prevention regulations / occupational safety regulations

Our system components are GS safety certified. The instructions in this manual must be followed when installing our shoring systems.

Lifting and transport

- Chains for lifting the shoring box may only be attached at the designated lifting and handling points of the shoring plate.
- Lifting equipment (GS certified) must be suitable for the load to be lifted.
- For safety reasons, only lifting hooks with a safety catch may be used.
- The permitted tensile forces must be strictly adhered to.
- Transport should take place as close to the ground as possible, unnecessary swinging movements are to be avoided.

- While the load is being lifted, personnel or bystanders are not permitted to enter the slewing range of the lifting equipment or move under suspended loads.
- Check for overhead wires!
- Operator and banksperson must maintain eye contact throughout the operation.

Risk reduction measures

- The excavation site must be sufficiently secured and marked.
- Traffic flow next to the site must be controlled by additional safety personnel if required.
- All personnel must wear personal protective equipment (safety helmet / safety shoes/boots / gloves).
- Potential instabilities due to wind must be taken into consideration during assembly and installation of the shoring box.
- The shoring components should ideally be stored flat on a level and firm surface.
- Even greater care must be taken when pre-assembled components need to be stored on sloped ground.

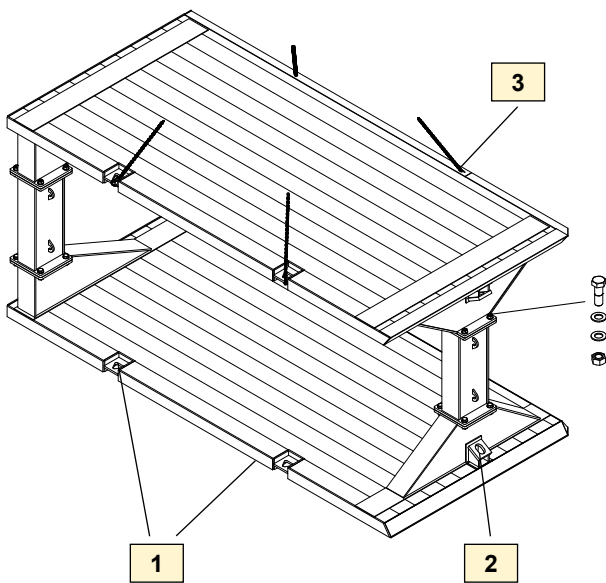
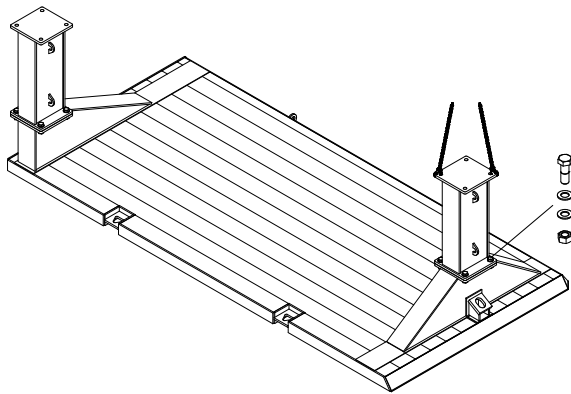
Maintenance and repair

- Operability of all system components must be checked before every use.
- Faulty or warped components must not be used.
- Slight damage may be repaired by a competent user after consulting with TWF. Otherwise, the service department in our manufacturing plant is available to help.
- Only original TWF parts may be used to repair the systems.

Depending on frequency and intensity of use, the components should be painted with anti-corrosion paint every two years.

► Operating manual

■ Installation instructions



Permissible tensile forces

The following maximum tensile forces are permitted at the individual attachment points:

- | | |
|---|----------|
| (1) Per pulling eye at the top end | = 196 kN |
| (2) Per pulling eye at the front of the plate | = 230 kN |
| (3) jPer transport eye | = 49 kN |

- Place slide rail with flange plate facing upwards on an even and firm surface.
- If strut extensions are used, they must be placed on the flange plates from above and connected using four M30 x 90 grade 8.8 bolts per flange.
- If more than one strut extension is used to achieve the required working width, they must be pre-assembled lying flat on the ground and then mounted to the flange plate as described above.
- Place one washer each under the bolt head and the nut.
- The strut extension remains connected to the lifting equipment during the installation process. For trench widths of up to 2.00 m all strut extensions are to be mounted to one plate. For wider trenches, the strut extensions are to be divided up and mounted to both plates.
- Attach the other drag plate with a 4-strand chain to the pulling eyes (1) in the top area and swivel the system in such a way that the flanges sit on the ground.
- Attach the two free chain strands to the transport eyes at the cutting edge (3) and lift it over the plate lying on the ground. The flange plates can be easily aligned, since the drag plate remains connected to the lifting equipment during the assembly process.
- The strut extensions must then be bolted together as described above.
- Detach the chains from the transport eyes at the cutting edge (3) and pull the fully assembled box upright from the pulling eyes at the upper end of the plate (1) (tilt by 90°) until it is vertical.
- To transport the box further, attach all four chain strands to the upper pulling eyes (1).

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■ Technical description

Not suitable

- For roads
- Where lines are crossing
- In the vicinity of buildings and other structures
- In the vicinity of traffic areas and lines/pipes at risk
- In non-binding soils
- In areas with groundwater and aquifers
- Where soil needs to be backfilled and compacted in layers
- Where subsidence cannot be tolerated

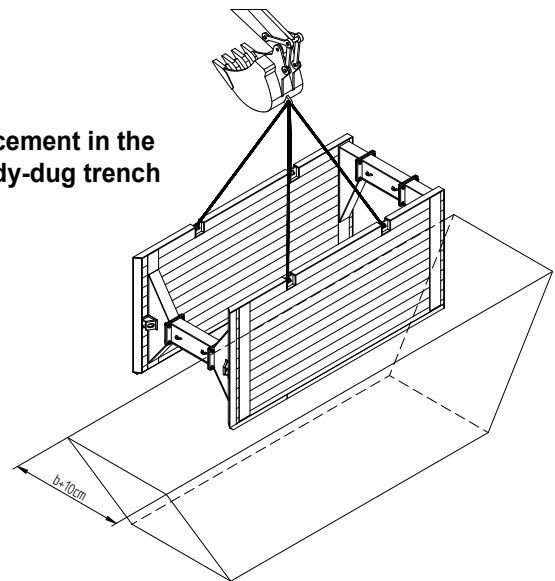
Recommended

- In open areas
- Where no lines are crossing
- Outside the vicinity of buildings and other structures
- Outside the vicinity of traffic areas and lines/pipes
- For temporarily stable soils and dry soils
- Where machinery is used to compact from above
- Where subsidence can be tolerated

■ Installation instructions

- The shoring box is placed in the trench that has been excavated to its final depth, whereby the **excavation should be 10 cm wider than the width of the box W**. The length of the excavated, unsecured trench section must be kept to the minimum required to install one single drag box.
- This method is only permissible if the aforementioned conditions are met.
- The ground is considered to be temporarily stable if no significant amounts of soil come loose and fall into the trench between the start of the excavation and installation of the shoring box

Placement in the ready-dug trench



■ Mode of operation

- Workers may only access the working area between the struts via a suitable ladder. **Never use the unsecured trench space in front of and behind the box.**

- The pipe is laid and connected in the area protected by the drag box. The chains are attached to the pulling eyes at the front sides of the shoring plates (2) and to the excavator bucket at the other end. It is not permitted to pull the box at the struts! Before the box can be dragged further along the



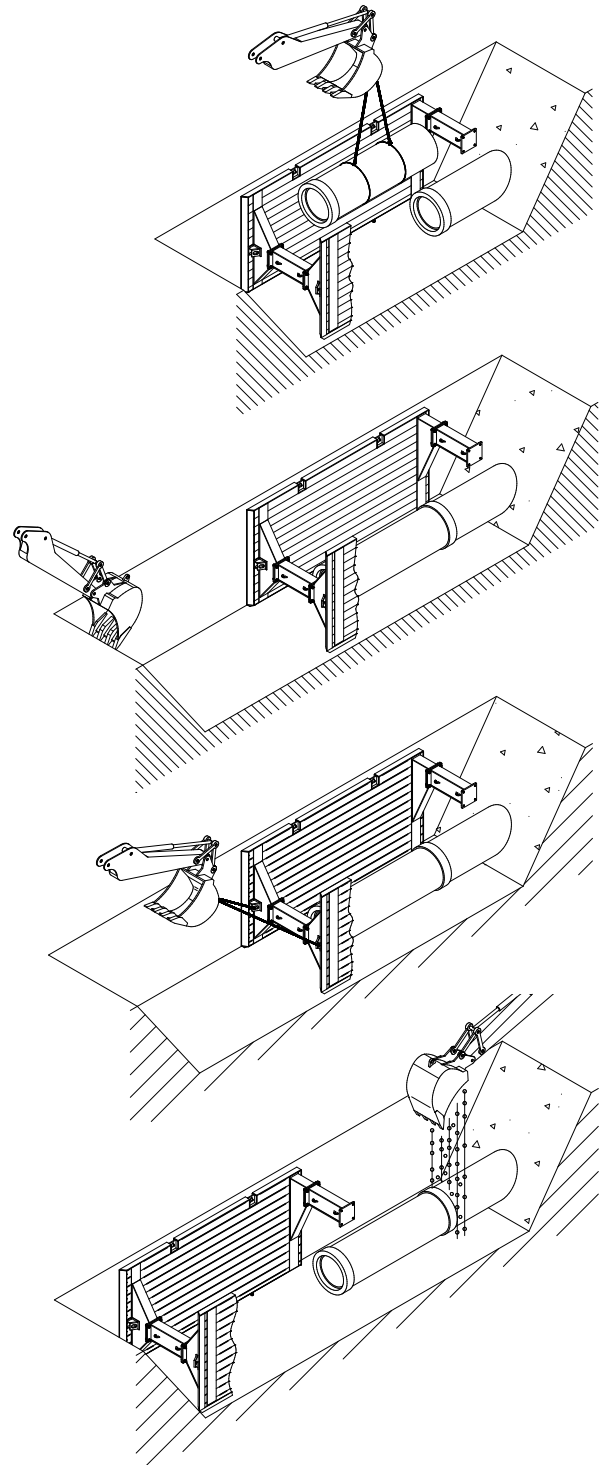
► Operating manual

trench, everyone must leave the trench. No persons may remain in the risk area. The drag box is then pulled further up the pre-dug trench into the new working area.

- It must be ensured that the most recently laid pipe section is sufficiently secured and its connection is not loosened by dragging the box. The trench should always be backfilled and the soil compacted behind the box, while keeping a slope towards the work space.
- **The area behind the box is unshored and must not be entered into!**
- Loose material must not drop into the work space when backfilling. The next section of the pipe can then be laid in the secured area of the trench, between the drag box plates.

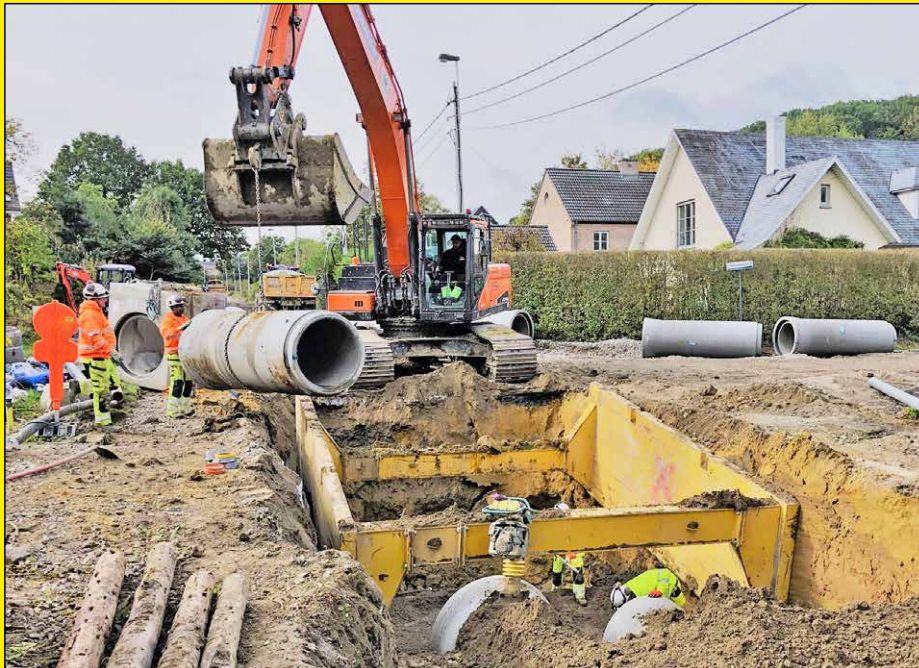
■ Extraction

- When pipe laying is complete, the shoring system can be extracted.
- This means lifting the complete drag box out of the trench.
- The box may only be pulled up using the designated lifting eyes (1).
- Please note that it is not permitted to enter the risk area either during installation or extraction of the system.
- Do not pull the system up on just one side in order to avoid putting excessive strain on the shoring plates. Slings must be attached to at least two designated lifting eyes of a plate.



TWF TIEFBAUTECHNIK

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