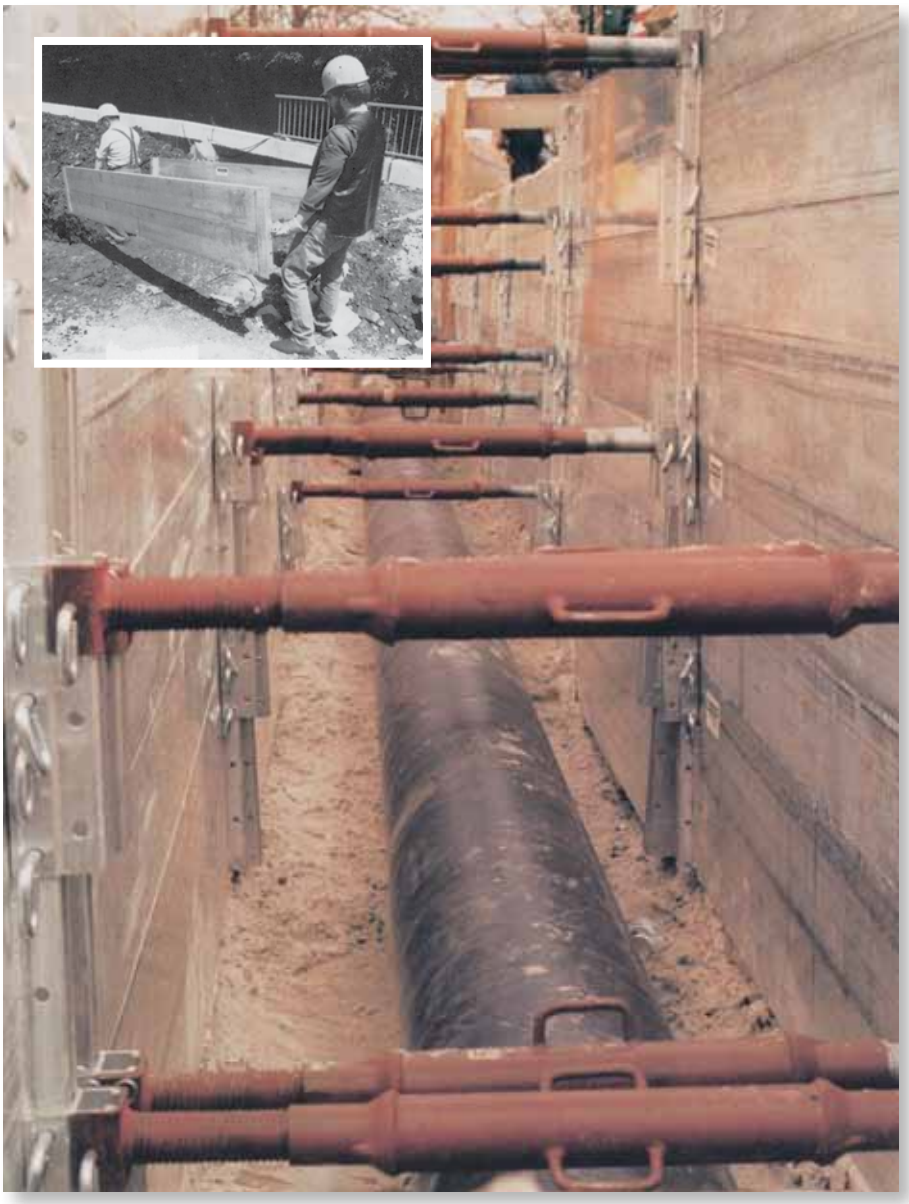
ISCHEBECK®
LITEBOX

LITEBOX trenching system

the flexible aluminium trench lining system



Benefits:

- light weight
- simple assembly
- fast installation
- 10 different plan formats for manholes
- safe and stable

The complete system for installing underground services in trenches as deep as 10 Feet in urban situations.

Ideal for laying cables, water and gas pipes, service pipes or cables, manholes, and repair or inspection work.

TRENCH LINING SYSTEMS

The easy-to-use lightweight aluminium trench and manhole lining system for urban situations

The LITEBOX trenching system is the ideal solution for lining trenches as deep as 10 Feet in urban environments.

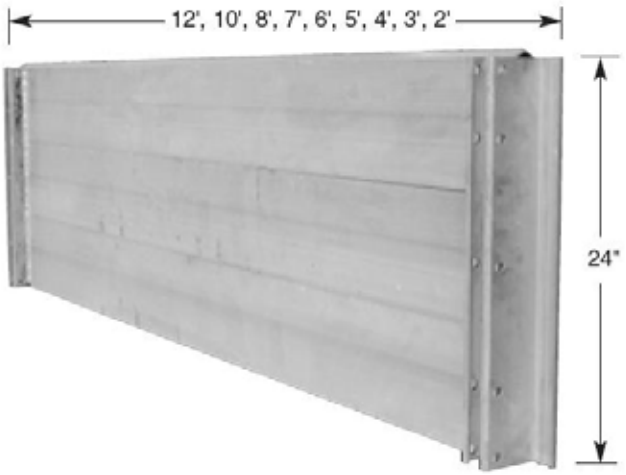
It can be used for all customary trench lining works such as for the laying cables, water and gas pipes, service pipes or cables, manholes, and repair or inspection work.

The system is also ideal for the thrust and reception pits for underground pipe jacking, and for end linings in services trenches.

The LITEBOX trenching system is suitable for all types of soil.

In stable soils:
lining installed as complete unit and withdrawn panel by panel.

In non-plastic and running soils:
partial excavation to allow the assembly of a manhole ring, lowering the manhole corners and aluminium panels alternately with the excavation, individual panels may be omitted, removal from the bottom up is possible.



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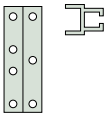
The individual components of the LITEBOX trenching system

LITE-SHIELD™ 24 PANELS

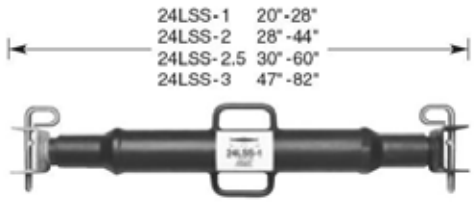
Lite-Shield 24™ Panels	Dimensions (L x H x W)	Weight
24LSP- 12	144" x 24" x 2"	155 lb.
24LSP- 10	120" x 24" x 2"	140 lb.
24LSP- 8	96" x 24" x 2"	114 lb.
24LSP- 7	84" x 24" x 2"	96 lb.
24LSP-6	72" x 24" x 2"	86 lb.
24LSP-5	60" x 24" x 2"	75 lb.
24LSP-4	48" x 24" x 2"	63 lb.
24LSP-3	36" x 24" x 2"	45 lb.
24LSP-2	24" x 24" x 2"	31 lb.

3-D lifting eye
safe working load: 2,200Lbs.

Lifting eye
for manhole corners



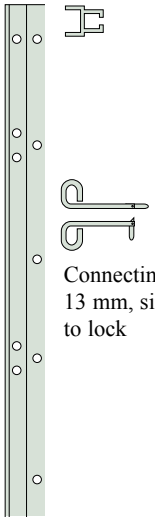
Panel connector
16"



Strut is shown with keyed locking pin,
which is for use with 24" system.

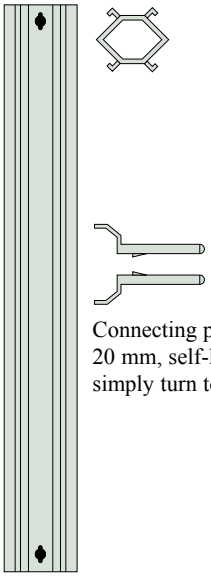
LITE-SHIELD™ 24 STRUTS

Adjustment Range (Inside Panel Dimension)			
Part No.	Weight	With Connector	W/O Connector
24LSS-1	12 lbs.	24 - 32 inches	20 - 28 inches
24LSS-2	16 lbs.	32 - 48 inches	28 - 44 inches
24LSS-2.5	21 lbs.	40 - 64 inches	30 - 60 inches
24LSS-3	25 lbs.	51 - 86 inches	47 - 82 inches



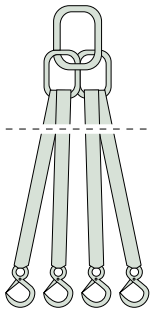
Connecting pin
13 mm, simply turn
to lock

Long connector 48" and
64", for 30" clearance below
bottom strut,



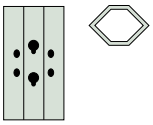
Connecting pin
20 mm, self-locking,
simply turn to lock

Manhole corner
MHC3,



Lifting sling
4 hooks, belt length
8'-2", approx. 9 Lbs,
safe working load:
2,200 Lbs

Strut spanner
19", for easy adjustment of struts



Coupler for manhole corner, 12"

SOIL TYPE	Equivalent Fluid Pressure (PSF)	MAXIMUM ALLOWABLE DEPTH (FT)			
		12 Ft. Panel	10 Ft. Panel	7 & 8 Ft. Panel	2-6 Ft. Panels
A	25	16	24	24	24
B	45	9	14	23	24
C	60	7	10	17	22
D	80	5	8	13	16

The variable lining system for trenches and manholes as deep as 10 Feet

The statistics of the German Civil Engineering Employers' Insurance Liability Association (TBG) confirm that the majority of fatal accidents take place in unsupported trenches no deeper than 10 ft. In such shallow trenches about 6'-6" deep, the danger of collapsing soil masses is underestimated and trench lining is not installed.

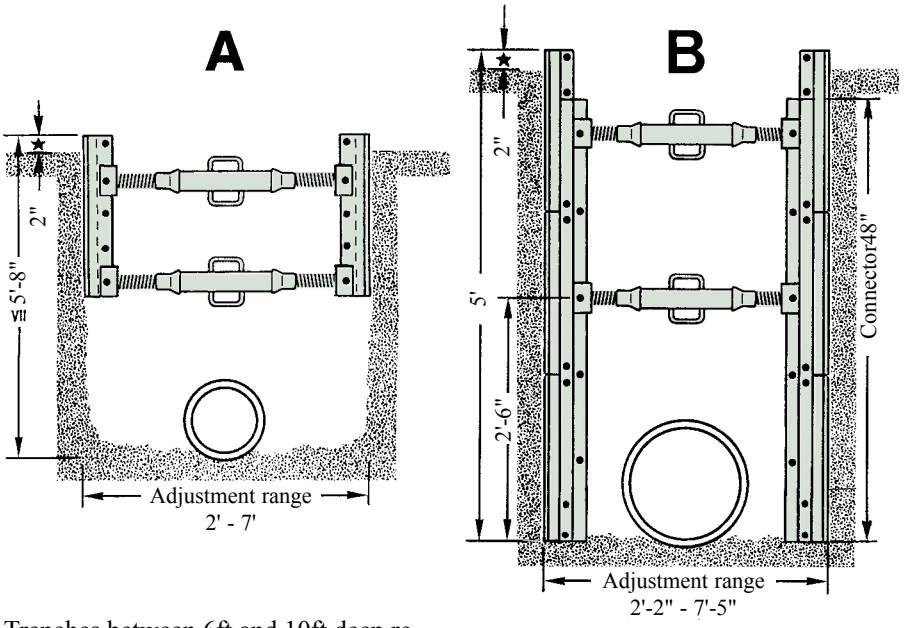
The well-known trench lining systems made of steel are unfortunately often too heavy, too complicated to use, oversized for these shallow trenches and always need an excavator for lifting and installation. Up until now there was no alternative to the well-known steel trench lining systems or manually installed timber planks, 9ft x 19in, 15ftt long, which have to be propped at four places and additionally weigh approx. 90Lbs.

Lightweight aluminium lining systems are used most frequently for trenches no deeper than 2'-6" – the majority of buried services can be found within this depth – as a trenchbox providing top support only. The top edges of the trench are therefore protected against collapse.

In urban environments it is important to minimise the disruption to roads and footpaths, and damage the existing pavements as little as possible. Two operatives can carry a trenchbox – weighing approx. 200 Lbs – and place it in the preliminary excavation. The excavator – frequently only a backacter with max. 1 t lifting capacity – can continue with the excavation work and is not disrupted for transporting, installing and removing trench lining items. The unobstructed working space between the struts is 9'-6" when using 10ft aluminium panels,
meaning that there is ample room for excavating and pipelaying.

Situation A	
Trench depth	5'-8"
No. of panels	2
No. of struts	4
Connectors: 16"	-
Connectors: 48"	-

Situation B	
Trench depth	5'
No. of panels	6
No. of struts	4
Connectors: 16"	-
Connectors: 48"	4



Trenches between 6ft and 10ft deep require full-depth linings. The aluminium panels are rigidly joined together with the connectors to form large-format trench lining
units so that re-strutting during pipelaying is also possible.

The aluminium panels weigh no more than 92 Lbs. and so they are easy to move manually in order to avoid pipes and cables crossing
the trench.

Aluminium panels can be transported on small trucks and loaded/unloaded by hand. Such systems are ideal for the repair crews of
gas, water and electricity supply companies.

Another worthwhile feature is the system's integral guardrail posts. In urban areas, contractors and gas, water and electricity supply companies must employ all possible means to protect third parties (passers-by) against injury or damages. Those measures include proper signs, lighting and safety barriers plus minimal disruption
to and narrowing of roads and footpaths.

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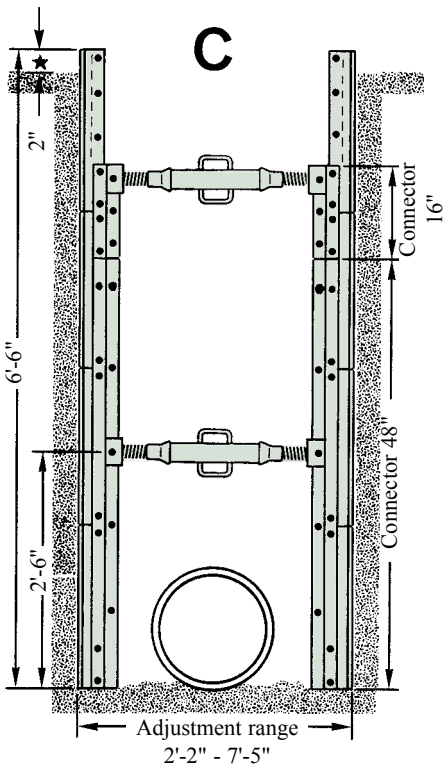
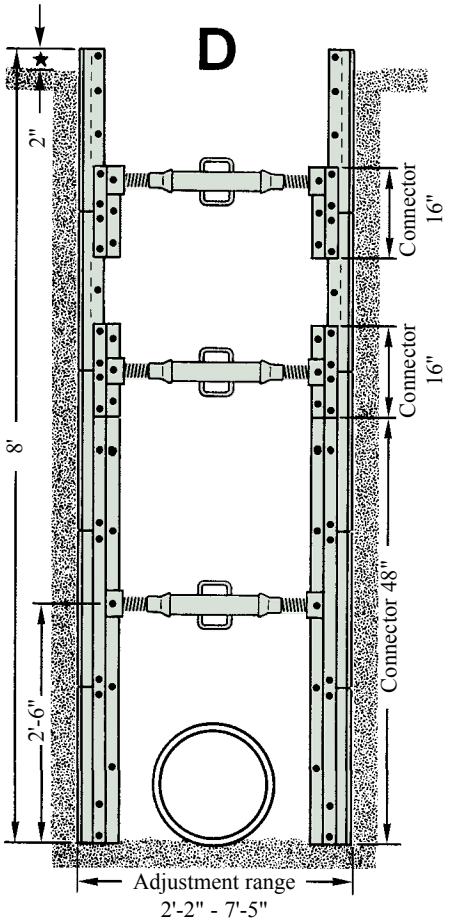
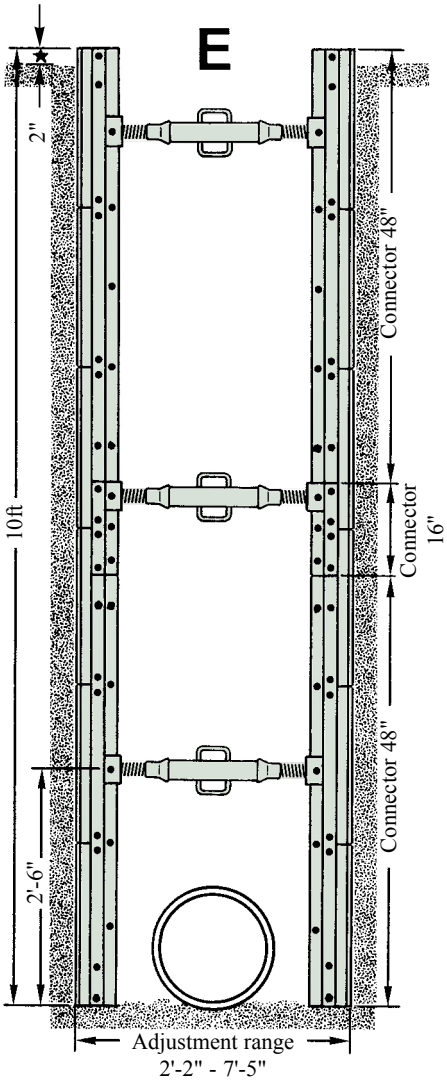
Situation C	
Trench depth	6'-6"
No. of panels	8
No. of struts	4
Connectors: 16"	4
Connectors: 48"	4

Situation D	
Trench depth	8'
No. of panels	10
No. of struts	6
Connectors: 16"	8
Connectors: 48"	4

Situation E	
Trench depth	10'
No. of panels	12
No. of struts	6
Connectors: 16"	4
Connectors: 48"	8







* 2" projection required by DIN 4124

Tighten and release with
the strut spanner

3-D lifting eye for
attaching lifting sling

Panel-by-panel withdrawal
of manhole corners

Support bracket for securing
the trench lining against slippage

Technical specification

Earth pressure according to German Civil Engineering Employers' Insurance Liability Association (TBG))

Trench depth	≤ 10ft	13ft	16ft	20ft	23ft
Earth pressure e_k Lbs./sqft	360	470	585	700	810

Trench lining average weight approx. 7 Psf

Aluminium panel length		12ft	10ft	7+8ft	3,4,5,6ft
Permissible trench depth	A	16ft	24ft	24ft	24ft
	B	9ft	14ft	23ft	24ft
	C	7ft	10ft	17ft	22ft
	D	5ft	8ft	13ft	16ft
Centre-to-centre spacing of struts along length of trench		11.5ft	9.5ft	6.5/7.5ft	2.5,3.5, 4.5,6.5ft
Unobstructed clearance below bottom strut		2'-6"	3'-7"	3'-7"	3'-7"

Note: When re-strutting during pipelaying, the maximum permissible spacing of struts may not exceed 3'-7".

Manholes
15 different plan formats available

12ft x 12ft (12'-8" x 12'-8")	–	–	–	
12ft x 10ft (12'-8" x 10'-8")	10ft x 10ft (10'-8" x 10'-8")	–	–	
12ft x 8ft (12'-8" x 8'-8")	10ft x 8ft (10'-8" x 8'-8")	8ft x 8ft (8'-8" x 8'-8")	–	
12ft x 7ft (12'-8" x 7'-8")	10ft x 7ft (10'-8" x 7'-8")	8ft x 7ft (8'-8" x 7'-8")	7ft x 7ft (7'-8" x 7'-8")	
12ft x 6ft (12'-8" x 6'-8")	10ft x 6ft (10'-8" x 6'-8")	8ft x 6ft (8'-8" x 6'-8")	7ft x 6ft (7'-8" x 6'-8")	6ft x 6ft (6'-8" x 6'-8")

Dimensions in ( ) = external size of aluminium manhole lining
Permissible clearance below bottom strut in manhole = 3'-3"
LITEBOX trenching system complies with German standards DIN 4124 and DIN EN 13331.

LITEBOX trenching system is tested for safe working conditions by the specialist committee of the German Civil Engineering Employers' Insurance Liability Association (TBG).
Always follow the instructions!

Initial assembly on the building site
The elements are simply fitted together with the self-locking connecting pins. The work can be carried out manually without the need for lifting equipment.
When installing struts, make sure that the spindles are extended equally on both sides and that all spindles with left-hand threads (black) are placed on one side, all spindles with right-hand threads (galvanised) on the other.

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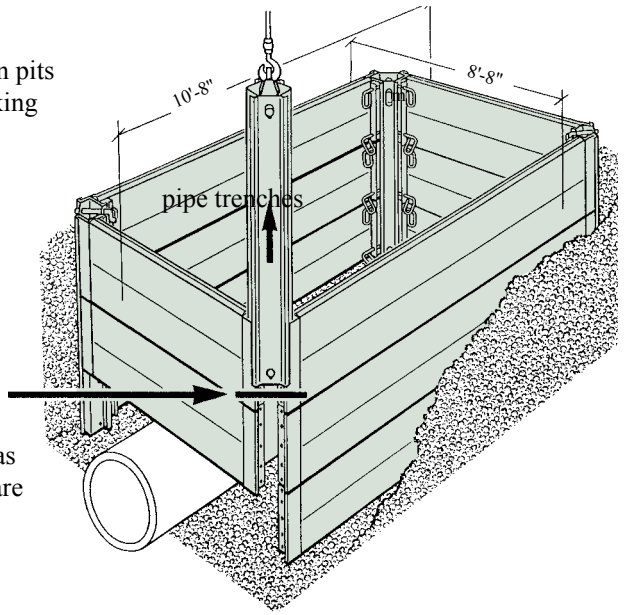
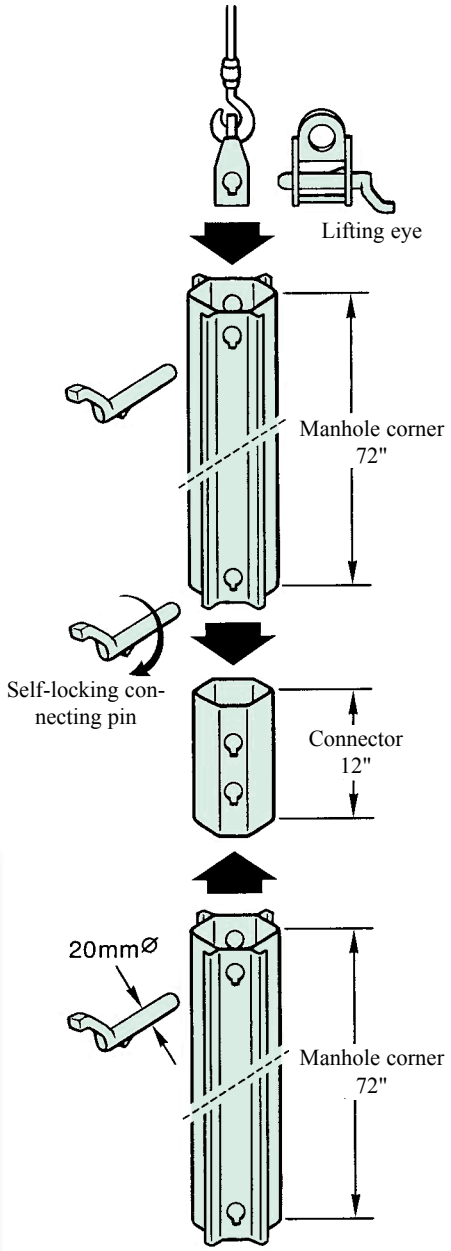
Aluminium manhole lining

- with 15 different plan formats
- for pipe repairs and routine inspections
- for the thrust or reception pits in underground pipe jacking operations
- for end linings in



The aluminium panels are removed successively from the bottom upwards as the manhole corner posts are raised



Renewal of road gullies

When using LITEBOX strongrail, either side of the trench lining can be installed or removed separately. This halves the force required to install or remove panels, which helps to preserve the panels and speed up the work.

The use of LITEBOX strongrails halves the number of struts required compared to the use of panels supported at their ends. Fewer struts means savings in materials, advantages during excavation and when re-strutting during pipelaying.

Connector suitable for aluminium panel and LITEBOX strongrails

3-D lifting eye suitable for aluminium panel connector and LITEBOX strongrails

One side omitted for working on a basement wall section by section

Special solution: manhole lining with additional struts

Lightweight aluminium trench lining with 24" x 24" opening

The struts allow the sides to be inclined at an angle of up to 5°.

A combination of 10ft, 6ft and 2ft aluminium panels enables an opening to be formed

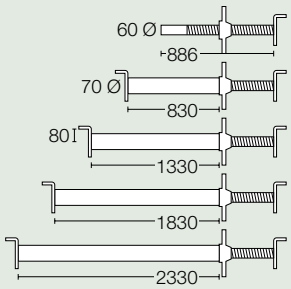
Aluminium panels as formwork for a pocket foundation

Trench Strut TITAN

Trench strut TITAN 60 for safe working loads from 15,000 to 22,000 Lbs. In wide and deep trenches (large drains, sewers, etc.), generous strut spacings simplify excavation work and pipelaying. The TITAN 60 trench strut is suitable for the vertical trench sheeting often used in such situations. With angle end plates for 140 x 160 mm timber walings.

- Length infinitely adjustable over 24inch
- Just one Ø 60 mm spindle fits all strut sizes
- Fast-action thread: 3/8" length adjustment for each turn
- Releasing the strut requires only half the effort
- Spindle and tube interchangeable, but permanently coupled together when in use

Trench strut TITAN 60 to DIN 4124

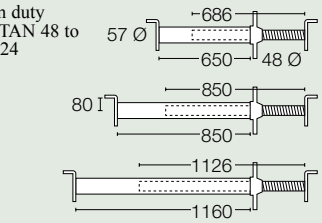


weight app. Lbs	adjustment app.	perm. load Kips	description
22	24"	-	Ti 60 Spindel
37	3' to 5'	22 - 21	Ti 60/150
43	4'-7" to 6'-6"	22 - 20	Ti 60/200
49	6'-2" to 8'-2"	21 - 18	Ti 60/250
55	7'-10" to 9'-10"	19 - 16	Ti 60/300

Medium duty strut TITAN 48 for safe working loads from 8,400 to 14,000 Lbs. Our best-selling strut for the most common trench widths of 3'-3" – 5'. With angle end plates for 140 x 160 mm timber walings.

- Length infinitely adjustable
- Easy to use with high loads
- Spindle and tube interchangeable, but permanently coupled together when in use

Medium duty strut TITAN 48 to DIN 4124

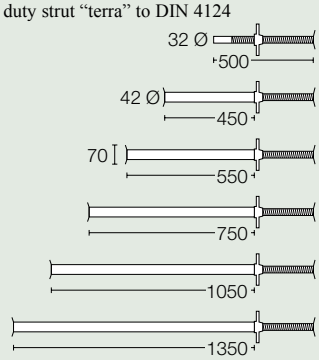


weight app. Lbs	adjustment app.	perm. load Kips	description
19	2'-3" to 3'-10"	14 -11	Ti 48/120
22.6	3' to 5'	13 - 10	Ti 48/150
28.4	3'-11" to 6'-10"	13 -8	Ti 48/210

Light duty strut “terra” for safe working loads from 4,800 to 8,400 Lbs. Ideal for use with horizontal, timber trench lining systems in narrow trenches (e.g. building service lines, manual excavation for repairs, etc.). With claw end plates and nailing holes.

- Length infinitely adjustable over 12 inch
- Tubular steel spindle Ø 32 mm is 40% lighter than a solid spindle for the same load
- Hardened thread can withstand tought, dirty working conditions
- Spindle and tube interchangeable, but permanently coupled together when in use

Light duty strut “terra” to DIN 4124



weight app. Lbs	adjustment app.	perm. load Kips	description
4.6	12"	-	terra Spindel
8.0	1'-7" to 2'-7"	8.4 - 6.6	terra Gr. 1
8.6	1'-11" to 2'-11"	7.9 - 6.4	terra Gr. 1a
9.9	2'-7" to 3'-7"	7.5 - 6.4	terra Gr. 2
11.8	3'-7" to 4'-7"	6.4 - 5.0	terra Gr. 3
14.0	4'-7" to 5'-7"	5.7 - 4.8	terra Gr. 4

Instructions for using trench struts to DIN 4124
(These instructions must be available on the building site.)

Conditions of use for steel bracing elements

1. Use bracing elements only for the purpose for which they are intended.
2. Prior to use, always check the condition of bracing elements. Never use damaged elements.
3. Do not exceed the stated safe working load (SWL).
4. Do not support loads on or suspend loads from bracing elements.
5. Bracing elements may only be assembled from parts marked with the same approval marking.
6. When setting up the trench shoring, always position the spindles alternately on the left and right sides of the trench. This method ensures that the weakest parts of the entire trench shoring system do not all lie in one and the same vertical plane.
7. To achieve a concentric loading, install the bracing elements so that their end plates fit tightly against the trench lining elements. If the trench sides are not parallel, this lack of alignment must be compensated for by using hardwood wedges.
8. Make sure that any anti-corrosion coating on the bracing elements remains intact. Apply a generous amount of grease to all threaded parts.
9. Trench struts must be marked with the inspection number of the German Civil Engineering Employers’ Insurance Liability Association (TBG) and the manufacturer’s designation.
10. Trench struts must be checked once a year in the company by a trained person according to the manufacturer’s instructions.
11. Adjustable steel props designed for vertical support applications may not be used as an alternative to trench struts in civil engineering applications.

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Superstrut Gi-SV for safe working loads from 57kips to 121 Kips, with end hooks for HEB 140 – 300 steel sections.

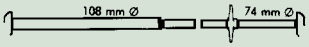
- Length infinitely adjustable over 28in
- Just one Ø 100 mm spindle fits all strut sizes
- Self-centring end hooks for HEB steel walings
- End hooks optimally secured against slipping and twisting

Gigant SV
with end hooks for
HEB 140 – 300 sections

Type Inspection No.	Description	adjustment approx.	perm. load Kips	weight approx. Lbs
Trench strut	Gi-SV-210	4'-7" to 6'-10"	120 - 64	152
Gigant SV	Gi-SV-260	6'-2" to 8'-6"	104 - 62	178
TBG 3-Gi-SV	Gi-SV-310	7'-10" to 10'-2"	93 - 60	202
	Gi-SV-380	10'-2" to 12'-6"	86 - 57	235
	Gi-SV-450	12'-6" to 14'-9"	76 - 57	268

Superstrut Gi-S for safe working loads from 30 Kips to 46 Kips, with end hooks for HEB 140 – 240 steel sections.

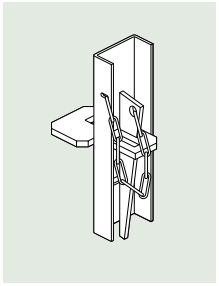
- Self-centring end hooks for HEB steel walings
- End hooks optimally secured against slipping and twisting



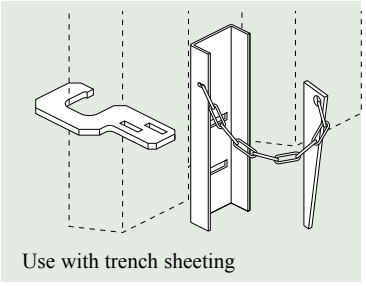
Gigant S
with end hooks for
HEB 140 – 240 sections

Type Inspection No.	Description	adjustment	perm. load approx.Kips	weight app. Lbs
Trench strut	Gi-S-120	2'-3" to 4'	46 - 39	57
Gigant S	Gi-S-170	3'-5" to 5'-6"	46 - 39	70
TBG 3-Gi-S	Gi-S-210	4'-7" to 6'-10"	40 - 34	79
	Gi-S-260	6'-2" to 8'-6"	38 - 30	88
	Gi-S-310	7'10" to 10'-2"	34 - 30	99

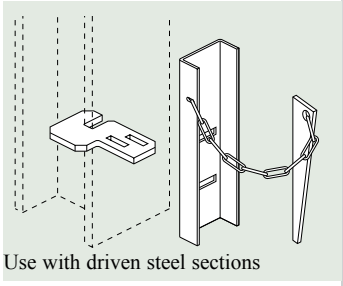
TITAN Wedge Clamps
Max. permissible load 2,200 Lbs.
For trench lining systems with timber planks and TITAN wedge clamps
Suitable for deep trenches (16ft – 26ft) in urban locations.



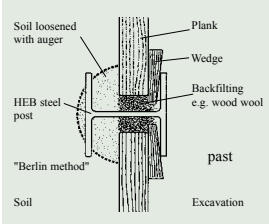
- Preliminary excavation without trench lining down to a depth of 4ft – no problem with the majority of buried services.
- Insertion of posts (e.g. HEB beams) into augured holes and driving to full depth – no noise problems.
- Positioning the timber planks in front of the steel posts saves expensive manual excavation between the posts (the normal situation with a soldier pile wall).
- Timber lining easy to handle and easy to cut where services cross the excavation.
- TITAN Wedge Clamps are suitable for plank thicknesses of 2" - 3" and HEB 100 – 280 steel sections.
- Number of wedge clamps required:
  spacing of steel posts = 7'-6", 1.4 pcs./10ft^2
  spacing of steel posts = 5', 1.8 – 2.0 pcs./10ft^2

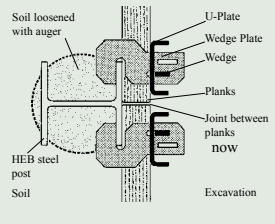


Use with trench sheeting



Use with driven steel sections





TITAN Superstruts

The first choice for every trench shoring job

- Superstrut Gi-SV
  TBG 3-Gi-SV
- Superstrut Gi-S
  TBG 3-Gi-S
- Spindle/strut heads Gi-SV-I
  TBG 3-Gi-SV-I
- Trench strut TITAN 60
  TBG 3-TI
- Medium duty strut
  TITAN 48
  TBG 3-Gi-L
- Light duty struts „terra“
  TBG 3-terra
- TITAN wedge clamps

…approved according to DIN 4124 by the German Civil Engineering Employers' Insurance Liability Association (TBG) – a legal requirement since 1 January 1982

What that means for you is:

- No problems during the acceptance inspection
- Quality-tested as part of the quality control contract with the Material-Testing Institute of North Rhine-Westphalia

TRENCH SHORING SYSTEMS

ISCHEBECK® **. . . technically advanced formwork, shoring, trenching and geotechnical systems**

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