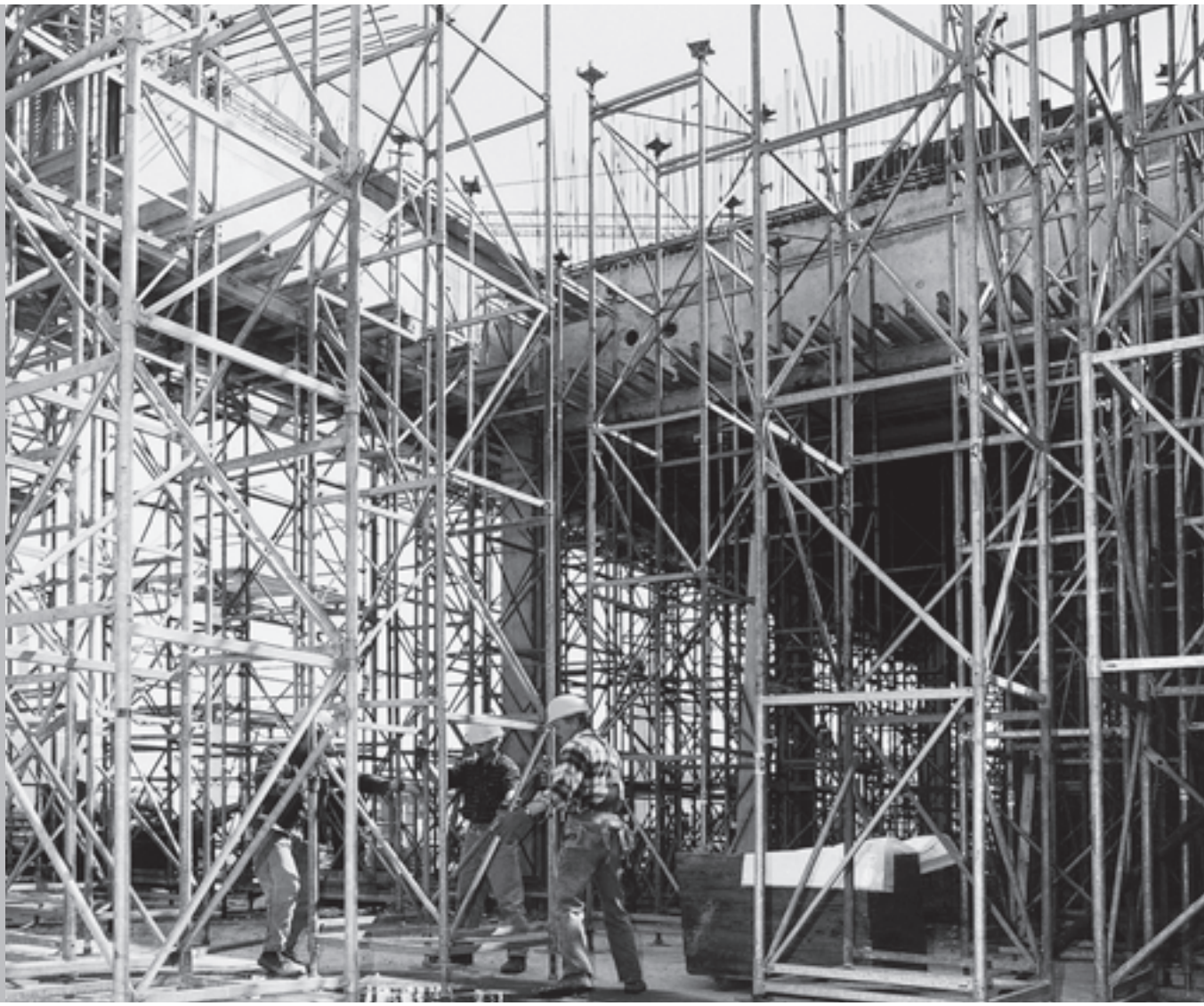
ID 15

Frame support

Instructions for erection and use

April 2008



HÜNNEBECK

1.0 Contents

2.0	Product features/ Safety Instructions	
	2.1 General information	3
	2.2 Safety Instructions	3
3.0	Overview	4
4.0	Components	5–7
5.0	Application planning & preparatory work	8
6.0	Determination of material	9
7.0	Load-bearing capacity	10–11
8.0	ID15 Frame support with H20 beams	
	ID15 Frame support with R24 beams	12–13
9.0	Erection and dismantling	14–18
10.0	Application examples	19–21
11.0	Construction sites	22–23

2.0 Product features

The **HÜNNEBECK ID15 Frame Support** is a load-bearing tower with base dimensions of 1.0 m x 1.0 m. Using only 6 different standard components, every required height can be achieved. Depending on the height required, towers can be assembled either by Frames 100, Frames 133 or combinations of these frames and parts taken from the supplementary components.
Towers of any height can be erected infinitely variable because the combined adjustment range of the Head Jack and Base Jack exceeds the 33 cm grid of the frames. All component parts are hot-dip galvanized. The dead weight comes up to about 42 kg/rising metre (including Head and Base Jacks).
The articulated attached bearing plates of the Head and Base Jacks allow adaptations to sloping situations of up to 6%.
In total, the full adjustment range of the jacks is 59.8 cm.
Due to the official approval, only a reduced range of 49.7 cm may be used.
Both Frames (100 and 133) need the same type of diagonal as bracing. Owing to the required assembly produce by changing the postion of frames by 90° from lift to lift, the same rigidity in all veritcal planes of the towers is achieved.
The standard frames are joined tension-proof by the built-in quick-action connectors.
The post consist of tubes with 48.3 mm dia. and therefore couplers for bracings made of common scaffold tubes can be mounted. The towers may be used for almost all heights when stabilized by horizontal anchorings at certain levels.
The vertical distances for such stabilizing methods are given by the relevant load tables.

Horizontal assembly

The design of the individual components allows every tower to be assembled in horizontal position. Even tall towers can quickly and time-savingly be assembled and then lifted and transported to the location of use by the help of a crane.

Warning/Caution!:

Cautionary notes and warnings are identified in this erection and usage instruction as ⚠. Non-observance with these notes may lead to severe injuries and/or damages!

Legend:

⚠ **Warning/Caution!:**
refers to erection steps which must be followed very carefully, otherwise the proper installation of the **ID 15-Frame Support** cannot be ensured. Non-observance may lead to severe injuries and/or damages. These warnings and notes require absolute attention in order to ensure the desired safety provided by **ID 15-Frame Support**.

Inspection:
refers to erection steps which require specific attention by either visual inspection or others means described in more detail.

2.1 General information

These erection and usage instructions provide important information about the installation and application of the **HÜNNEBECK ID 15-Frame Support**, as well as precautions which are necessary for the safe erection and the reliable use. These instructions are intended for the effective work with the guard rail system. Please read the instructions carefully prior to erection and use of the guard rail system and keep it handy as a reference book.

2.2 Safety Instructions

The following erection and use instructions contain information regarding the installation and use of the products mentioned or depicted in it.

The illustrations shown in these standard erection and use instructions shall be considered as samples only on how to use **"ID 15-Frame Support"** safely. Add-ons, deviations or changes to specific items always require additional installation instructions by the user, which must be provided based upon the assessment of the risk and, if necessary, requires additional structural analysis.
The currently available occupational health and safety regulations always apply to the safety-related use of our products.

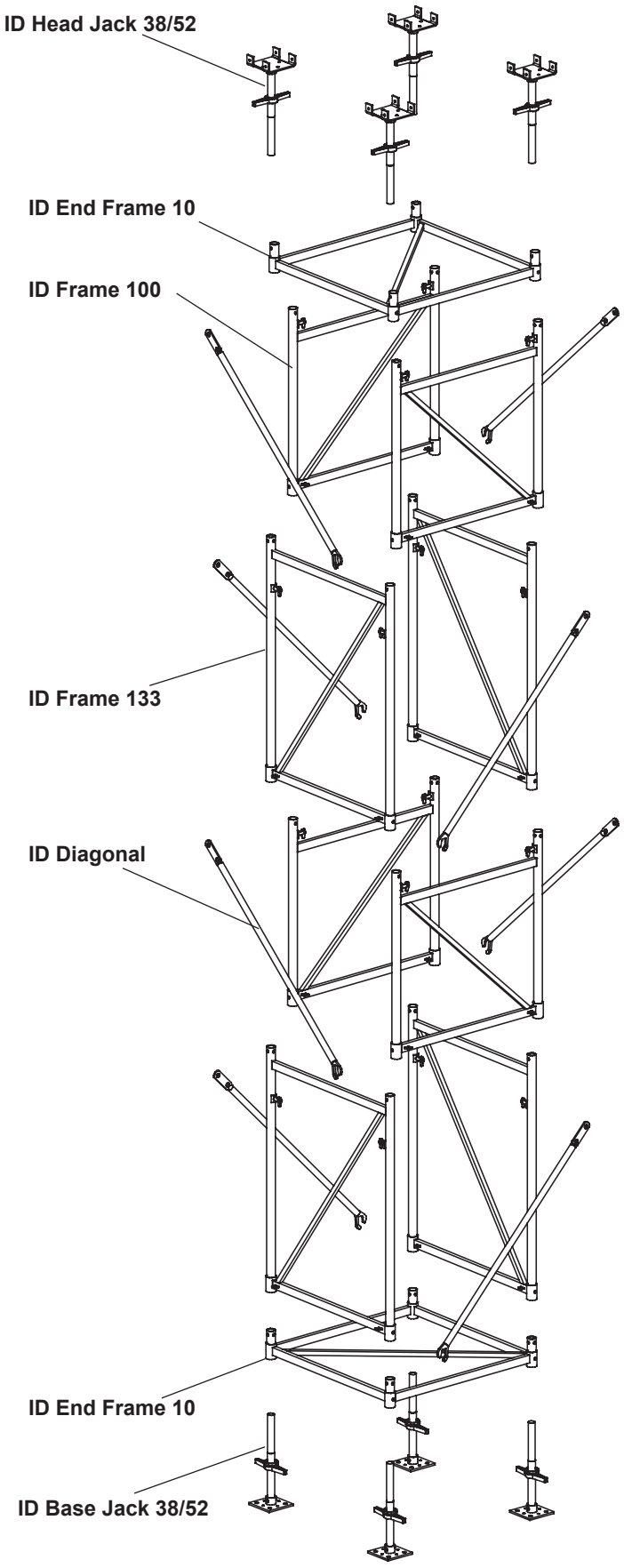
The installation must be used in addition to existing fall protection systems. Otherwise, the user shall provide safety measures based on the requirements of § 5 ArbSchG (German law pertaining to the prevention of industrial accidents).

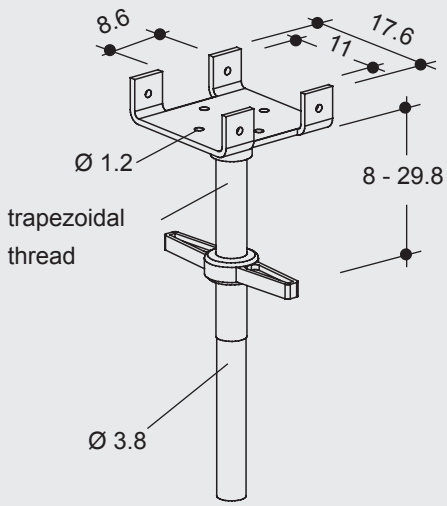
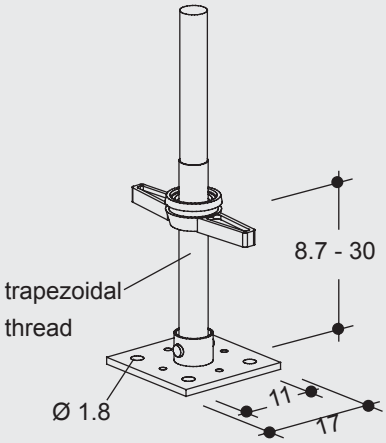
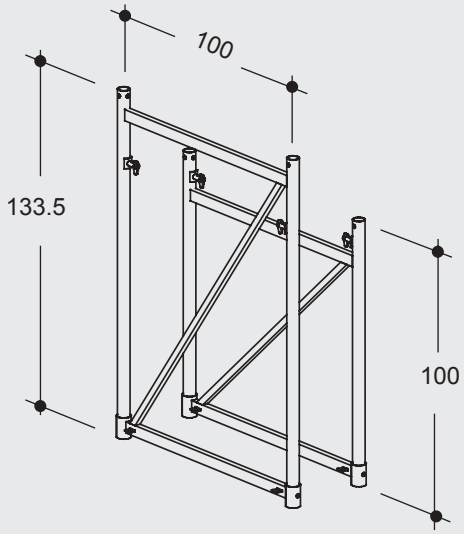
Only undamaged original parts by **HÜNNEBECK** may be used. For this very reason, all components must be visually inspected for their origin and for possible damages prior to any installation. If necessary, those parts must be replaced with original components.
When requiring spare parts, only original **HÜNNEBECK** parts must be used.
Mixing our systems with those from other manufacturers are inherently dangerous and require a separate inspection.

The illustrations in this “Instructions for erection and use” are used to emphasise the recognition of details and therefore, may not always be complete from a safety point of view.

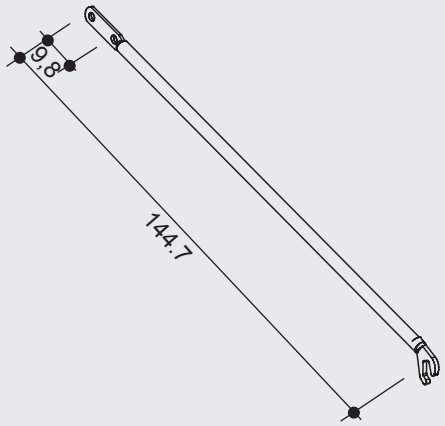
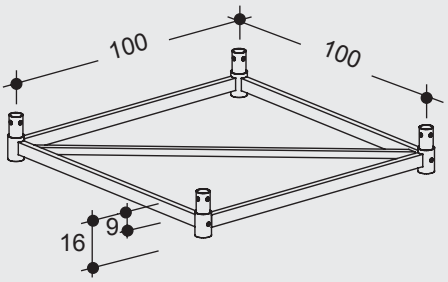
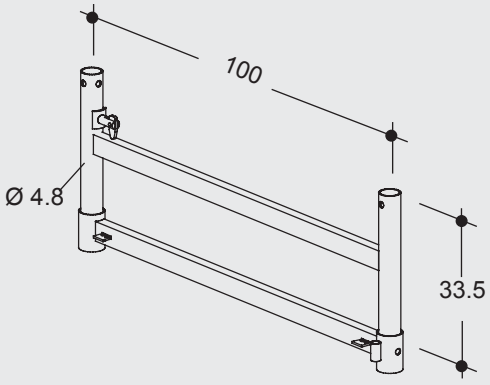
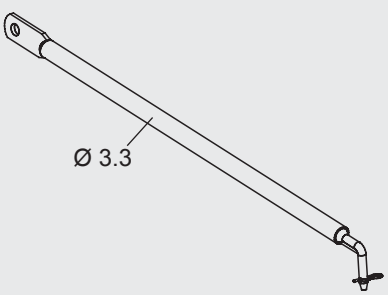
Based on the engineering development, we reserve the right to change any design without prior notice.
The latest issue of the erection and use instructions may be downloaded from the internet, go to *www.huenebeck.com* or they can be ordered from **HÜNNEBECK** directly.

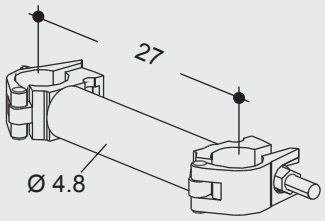
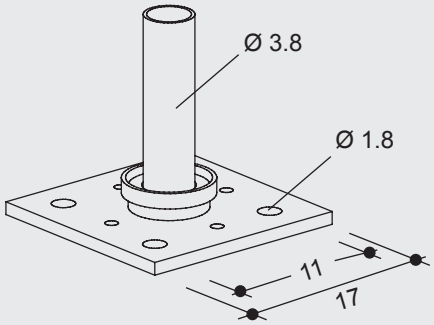
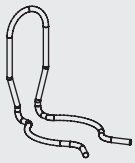
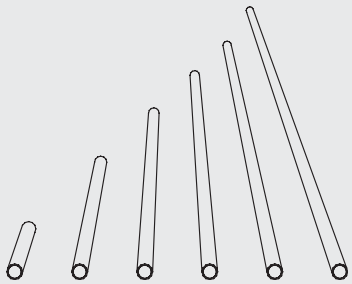
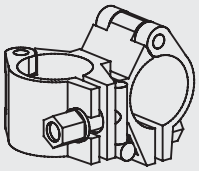
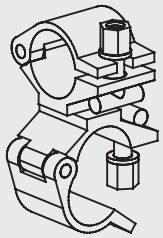
3.0 Overview


ID Head Jack 38/52
ID End Frame 10
ID Frame 100
ID Frame 133
ID Diagonal
ID End Frame 10
ID Base Jack 38/52

	Designation	Art. No.	Weight kg/pce.
Using the six major components of the basic equipment, frame supports for all required construction heights can be created. Reference must always be made to the design approval of ID 15 with ID End Frame 10.			
	**ID Head Jack 38/52** For bearing timber or steel beams. Slope of up to 6 % can be compensated by the**ID Head Jack 38/52**. Height adjustment: from **8 cm** to **29.8 cm**. Design approval must be adhered to!	148 530	8.20
	**ID Base Jack 38/52** For setting-up the frame support. Slope of up to 6 % can be compensated by the **ID Base Jack 38/52**. Height adjustment: from **8.7 cm** to **30.0 cm**. Design approval must be adhered to!	148 552	8.00
	**ID Frame 133** **ID Frame 100** The frames are tension-resistantly connected with the tightly built-in wedges of the quick-action connectors. Pins with gravity flips are provided for attaching the **ID Diagonals**. Design height of frame: 100 cm or 133.5 cm.	057 162 057 173	19.10 16.10

4.0 Components

	Designation	Art. No.	Weight kg/pce.
	**ID Diagonal** Used for bracing both types of frame within the tower at right angles to frame plane. The lower end with its claws is fixed to the horizontal bottom bar of one frame, the upper end fixed to the hinged pin of the opposite frame.	148 574	2.80
	**ID End Frame 10** To be assembled as sectional bracing of the frame support to ensure the square shape. Always installed at the top and at the base. Installation height at the top: **9 cm** Installation height at the base:**16 cm**	118 163	15.80
These parts enlarge the structural application possibilities.			
	**ID Adjustment Frame 33** Used for height adjustment of a frame support during successive applications. It makes the complete reconstruction of a tower unnecessary. Structural height of the frame: **33.5 cm**	077 670	8.80
	**ID Diagonal** Required as bracing for **ID Adjustment Frame 33.**	077 680	1.95

	Designation	Art. No.	Weight kg/pce.
	**Frame Connection 27** For connection of an additional frame panel (in vertical plane) to the frame support. Distance of legs (centre-to-centre): **27 cm**.	121 915	2.16
	**Head/Base Piece, rigid** Applicable to frame supports which do not require adjustment at the base or at the top. Structural height: **2.7 cm.**	062 935	2.72
	**ID 15 Base Jack Retainer** Prevents the base jack or head/base piece from dropping-out when towers are lifted and moved by crane.	078 652	0.05
Scaffold tubes 48.3 x 3.2 mm 	**Scaffold tube 48x3.2 50** **Scaffold tube 48x3.2 100** **Scaffold tube 48x3.2 150** **Scaffold tube 48x3.2 200** **Scaffold tube 48x3.2 250** **Scaffold tube 48x3.2 300** **Scaffold tube 48x3.2 350** **Scaffold tube 48x3.2 400** **Scaffold tube 48x3.2 450** **Scaffold tube 48x3.2 500** **Scaffold tube 48x3.2 600**	169 001 169 012 169 023 169 034 169 045 169 056 169 067 169 078 169 089 169 090 169 115	1.90 3.81 5.72 7.62 9.53 11.43 13.34 15.24 17.15 19.05 22.86
	**Rigid Coupler 48/48** w.a.f. 22 **Rigid Coupler 48/48** w.a.f. 19 Permissible load: 6 kN. (Class A) Required torque: 5 kNcm.	002 514 801 135	1.18 1.20
	**Swivel Coupler 48/48** w.a.f. 22 **Swivel Coupler 48/48** w.a.f. 19 Permissible load: 6 kN. (Class A) Required torque: 5 kNcm.	002 525 801 146	1.37 1.40

5.0 Application planning & preparatory work

The quick and safe erection of ID15 frame supports can be significantly improved by precedent application planning and preparatory work.

Application planning

- Drawings, material list, instructions for erection and use as well as the latest approvals of the design analyses should completely be handed over to the job-side.

Preparations for erecting

- Check the material with regard to completeness and flawless-ness and store it up clearly organized.
- Sort out damaged parts and place them separately, order replacemant parts. Damaged parts may also be, e.g., head jacks with bearing plates which show too much slope.
- Store and protect small quantities of material which will not be required during reconstruction of towers.
- Arrange everything, if necessary, for marking the final positions of the towers on the foundations in time.
- Instruct site staff for the assembly and operation procedures as far as necessary.

Static fundamentals for the design analsis of slab supporting systems.

Weight density of freshly placed concrete:

γ_c = 26.0 kN/m³

Dead load resulting from formwork, shoring structure, steel beams and/or timber formwork beams.

Live loads according to DIN 4421
Horizontal loads from wind pressure, DIN 1055, Teil 4.*

* Wind pressure:

q = 0	within the building (no wind)
q = 0.5 kN/m²	0-8 m over ground
q = 0.8 kN/m²	> 8 - 20 m over ground
q = 1.1 kN/m²	> 20-100 m over ground

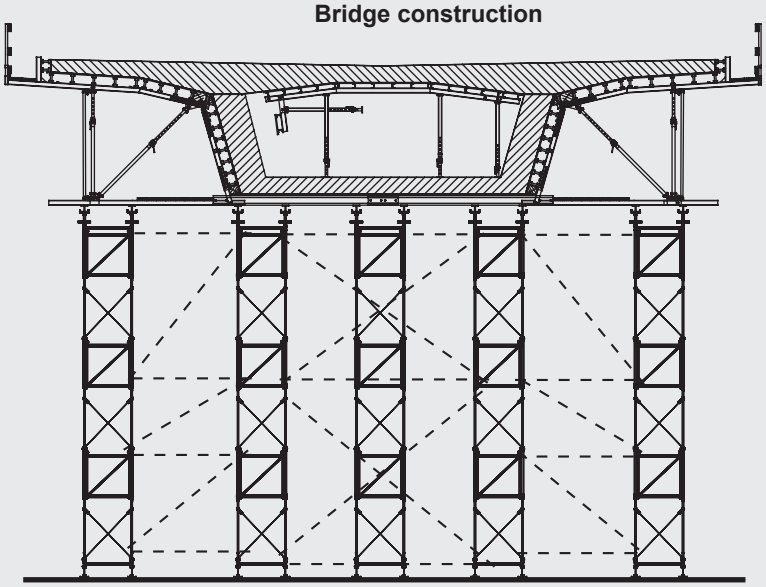
shape coefficient for ID15 tower: **1.3**

* Wind load per rising „m“ of **ID 15**: **1.3** • 0.4 m²/m • q
= 0.52 m²/m • q

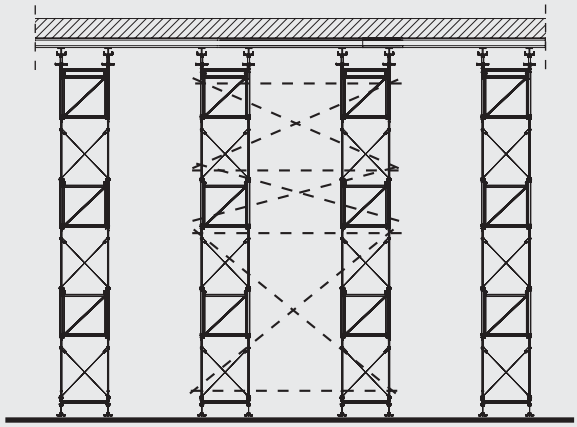
0 to 8 m	= 0.52 • 0.5 = 0.26 kN/m
> 8 to 20 m	= 0.52 • 0.8 = 0.42 kN/m
> 20 to 100 m	= 0.52 • 1.1 = 0.57 kN/m

Example:

Bridge construction



Slab construction



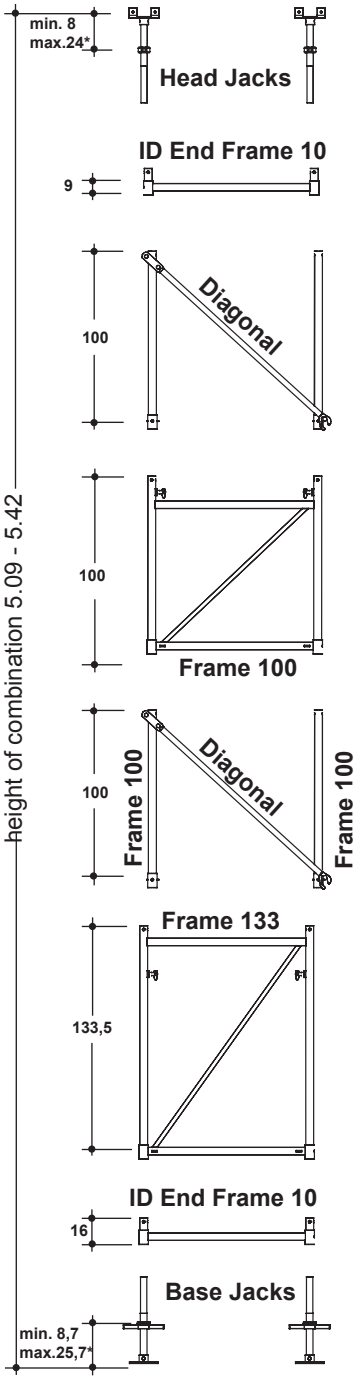
Lateral concrete pressure acting on formwork must be taken and absorbed by tie rods/anchors so that no additional loads will have a detrimental effect on the supporting structure.

6.0 Determination of material

Guide figures for calculating the required times for assembly and disassembly of towers:

0.17 hours per rising metre (each procedure). Approx. 4 hours per tonne (on a average). Time required for bracings made of tubes and couplers: approx. 25 to 30 hours per tonne.

Example of an ID 15 tower combination



*accord. to approval

Table of combinations

Art. No.:	148 530	148 552	057 162	057 173	118 163	148 574	Weight of tower kg
Weight/item [kg]	8.2	8.0	19.1	16.1	15.8	2.8	
Height of tower m	**Head Jack**	**Base Jack**	**Frame 133**	**Frame 100**	**End Frame 10**	**Dia-gonal**	
1.42 - 1.75	4	4	–	2	2	2	134.2
1.75 - 2.08	4	4	2	–	2	2	140.2
1.84 - 2.17	4	4	2	–	3	2	156.0
1.93 - 2.26	4	4	2	–	4	2	171.8
2.42 - 2.75	4	4	–	4	2	4	172.0
2.75 - 3.08	4	4	2	2	2	4	178.0
3.09 - 3.42	4	4	4	–	2	4	184.0
3.42 - 3.75	4	4	–	6	2	6	209.8
3.75 - 4.08	4	4	2	4	2	6	215.8
4.09 - 4.42	4	4	4	2	2	6	221.8
4.42 - 4.75	4	4	6	–	2	6	227.8
4.75 - 5.08	4	4	2	6	2	8	253.6
5.09 - 5.42	4	4	4	4	2	8	259.6
5.42 - 5.75	4	4	6	2	2	8	265.6
5.76 - 6.09	4	4	8	–	2	8	271.6
6.09 - 6.42	4	4	4	6	2	10	297.4
6.42 - 6.75	4	4	6	4	2	10	303.4
6.76 - 7.09	4	4	8	2	2	10	309.4
7.09 - 7.42	4	4	10	–	2	10	315.4
7.42 - 7.75	4	4	6	6	2	12	341.2
7.76 - 8.09	4	4	8	4	2	12	347.2
8.09 - 8.42	4	4	10	2	2	12	353.2
8.43 - 8.76	4	4	12	–	2	12	359.2
8.76 - 9.09	4	4	8	6	2	14	385.0
9.09 - 9.42	4	4	10	4	2	14	391.0
9.43 - 9.76	4	4	12	2	2	14	397.0
9.76 - 10.09	4	4	14	–	2	14	403.0
10.09 - 10.42	4	4	10	6	2	16	428.8
10.43 - 10.76	4	4	12	4	2	16	434.8
10.76 - 11.09	4	4	14	2	2	16	440.8
11.10 - 11.43	4	4	16	–	2	16	446.8
11.43 - 11.76	4	4	12	6	2	18	472.6
11.76 - 12.09	4	4	14	4	2	18	478.6
12.10 - 12.43	4	4	16	2	2	18	484.6
12.43 - 12.76	4	4	18	–	2	18	490.6
12.76 - 13.09	4	4	14	6	2	20	516.4
13.10 - 13.43	4	4	16	4	2	20	522.4
13.43 - 13.76	4	4	18	2	2	20	528.4
13.77 - 14.10	4	4	20	–	2	20	534.4
14.10 - 14.43	4	4	16	6	2	22	560,2
14.43 - 14.76	4	4	18	4	2	22	566,2
14.77 - 15.10	4	4	20	2	2	22	572,2
15.10 - 15.43	4	4	22	–	2	22	578,2
15.43 - 15.76	4	4	18	6	2	24	604.0
15.77 - 16.10	4	4	20	4	2	24	610.0
16.10 - 16.43	4	4	22	2	2	24	616.0
16.44 - 16.77	4	4	24	–	2	24	622.0
16.77 - 17.10	4	4	20	6	2	26	647.8
17.10 - 17.43	4	4	22	4	2	26	653.8
17.44 - 17.77	4	4	24	2	2	26	659.8
17.77 - 18.10	4	4	26	–	2	26	665.8
18.10 - 18.43	4	4	22	6	2	28	691.6
18.44 - 18.77	4	4	24	4	2	28	697.6
18.77 - 19.10	4	4	26	2	2	28	703.6
19.10 - 19.44	4	4	28	–	2	28	709.6
19.44 - 19.77	4	4	24	6	2	30	735.4
19.77 - 20.10	4	4	26	4	2	30	741.4

Extension of jacks accord. to approval: Head Jack 240 mm extended
Base Jack 257 mm extended

7.0 Load-bearing capacity

The follwing diagrams are examples to show the load-bearing capacity of the ID 15 tower, assembled with **ID End Frames 10**, and **ID Head Jacks 38/52** as well as **ID Base Jacks 38/52**.
For the pratical use, i.e. design calculation and execution of a shoring system, always make use of the complete approval and take into consideration the relevant Standard DIN 4421.

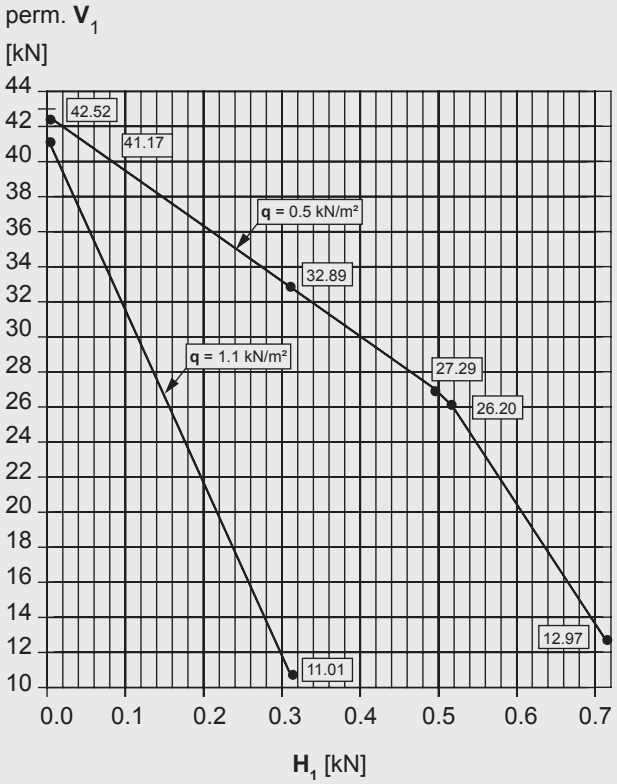
The statical analysis has to be worked out as per DIN 4421 according to the general formula

$$\gamma_T \cdot \mathbf{V} \leq \text{perm}, \mathbf{V}$$

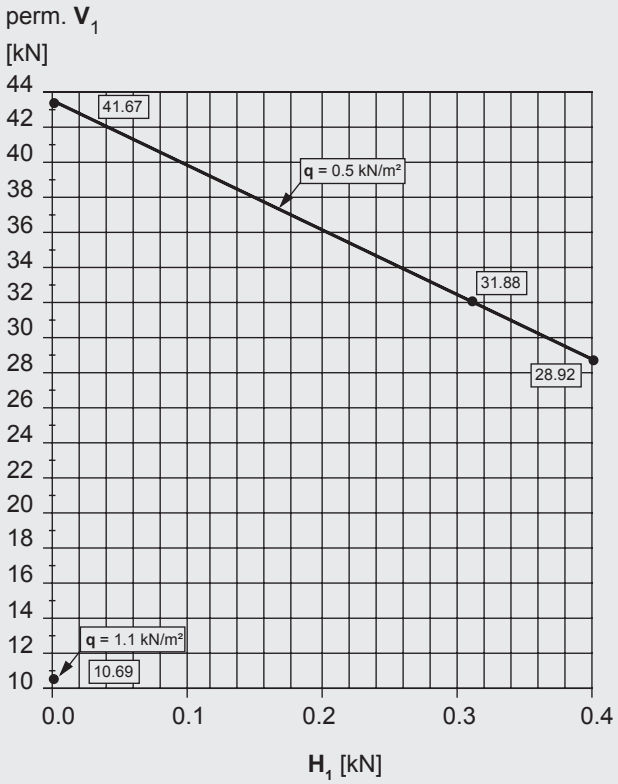
Explanations of terms:

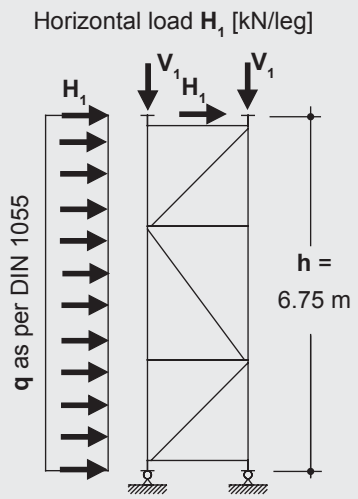
γ_T group factor as to DIN 4421
V existing vertical load
perm.**V** permissible vertical load

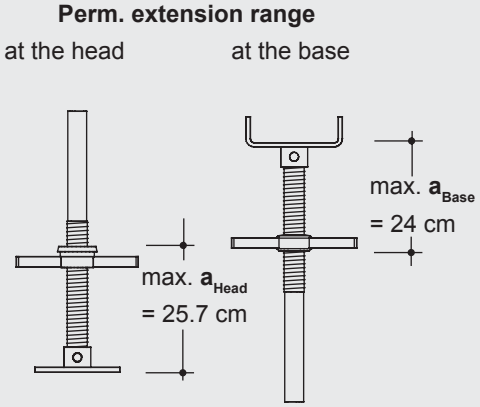
Example 1
Combined permissible horizontal and vertical loads for a **free-standing ID 15 frame support**. Wind pressure on the tower is already included in the diagram.
Height of tower = 6.75 m

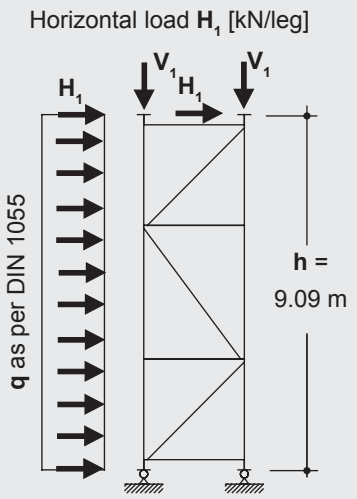


Example 2
Combined permissible horizontal and vertical loads for a **free-standing ID 15 frame support**. Wind pressure on the tower is already included in the diagram.
Height of tower = 9.09 m







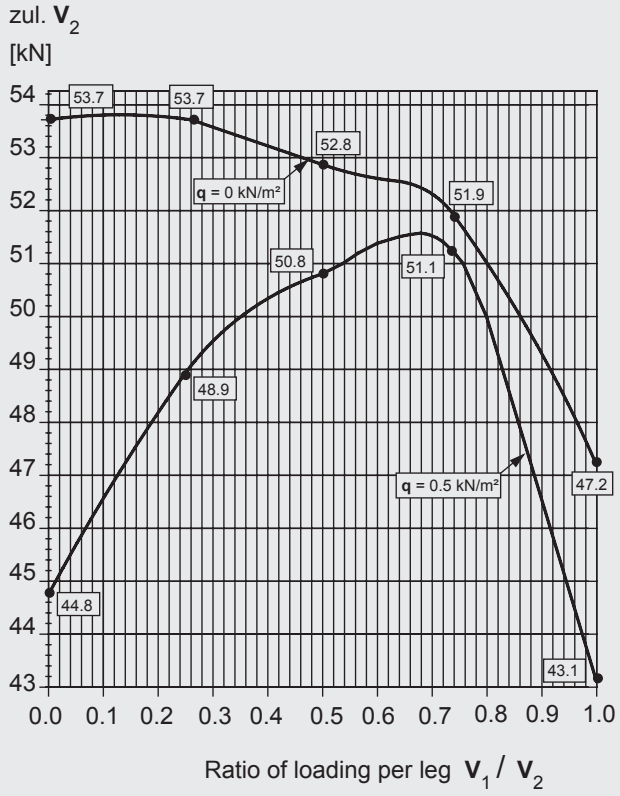


The size of the group factor depends on the **scaffold class** of **DIN 4421** which is made reference to.
As individual supporting member, the ID 15 Tower with **ID End Frame 10** is in conformance with the high requirements of the **scaffod class III** as stated in the approval. That is why the ID 15 frame support can be used in each of the three classes, especially also in **class III** with the most favourable **group factor of γ_T =1.00.**
The loads stated in the approval of the tower can be fully applied to within the **scaffold class III**.
The necessary safety against tilting and sliding of individual frame supports must be proved separately according to the relevant regulations for the stability of such structures.

Example 3

Permissible vertical loads (with different amounts per leg) for an **ID 15 Tower** which is **supported at the head**. Horizontal loads must be taken and transmitted above the head jacks.

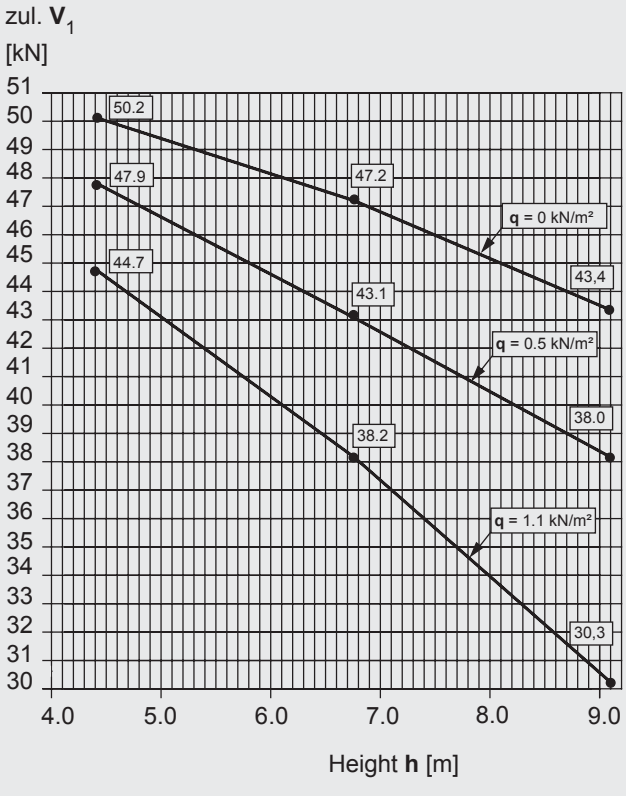
Height of tower h = 6.75 m

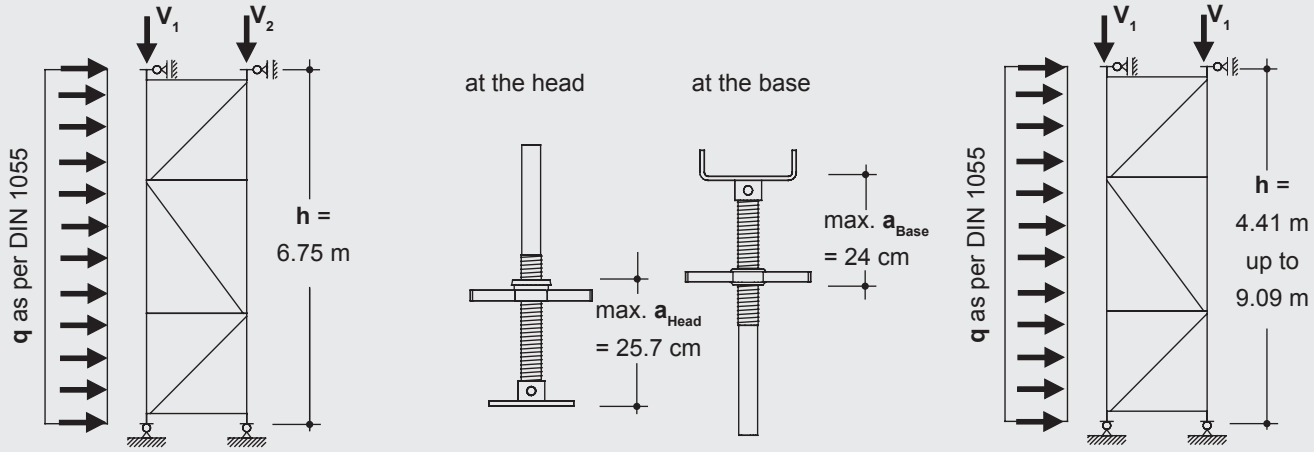


Example 4

Permissible vertical loads for an **ID 15 Tower** which is **sup-ported at the head**. Horizontal loads must be taken away and transmitted above the head jacks.

Height of tower from 4.41 m up to 9.09 m



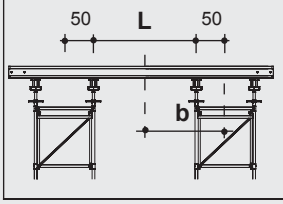


8.0 ID15 Frame Support with H 20 beams

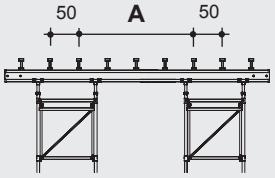
Loading Table (with H 20 secondary beams and double H20 primary beams)

	„t“ slab thickness [cm]													
	„q“ total loading [kN/m²]													
	14	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**35**	**40**	**45**	**50**	**55**
	5.39	5.91	6.43	6.95	7.47	7.99	8.51	9.03	9.61	11.2	12.7	14.3	15.9	17.4

Spacing of second beams [m]	**L** = allowable span of secondary beam [m]													
0.20	4.00	4.00	4.00	4.00	3.94	3.83	3.73	3.65	3.57	3.39	3.25	3.13	3.02	2.93
0.33	3.83	3.68	3.54	3.43	3.32	3.23	3.15	3.08	3.01	2.86	2.74	2.64	2.55	2.47
0.40	3.61	3.46	3.33	3.22	3.13	3.04	2.96	2.89	2.83	2.69	2.58	2.48	2.40	2.32
0.50	3.35	3.21	3.09	2.99	2.90	2.82	2.75	2.69	2.63	2.50	2.39	2.30	2.22	2.14
0.63	3.11	2.98	2.87	2.78	2.69	2.62	2.55	2.49	2.44	2.32	2.22	2.12	2.01	1.92
0.67	3.04	2.92	2.81	2.72	2.64	2.56	2.50	2.44	2.39	2.27	2.17	2.05	1.95	1.86
0.75	2.92	2.80	2.70	2.61	2.54	2.47	2.40	2.35	2.29	2.18	2.05	1.93	1.83	1.68

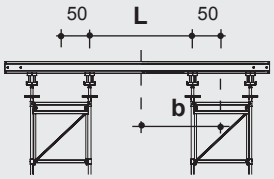


„b“ Loading widths **[m]** (b=L/2 + 0.5 m)	**„A“ allowable span of primary beams [m]**, (double beams: 2 x H20 timber beams)													
	resulting loads per leg [kN]													
1.00	3.35	3.21	3.09	2.99	2.90	2.82	2.75	2.69	2.63	2.50	2.39	2.30	2.22	2.14
	11.7	12.4	13.2	13.9	14.6	15.3	16.0	16.6	17.4	19.5	21.6	23.6	25.6	27.4
1.25	3.11	2.98	2.87	2.78	2.69	2.62	2,55	2,49	2.44	2.32	2.22	2.12	2.01	1.92
	13.8	14.7	15.6	16.4	17.2	18.1	18.9	19.7	20.7	23.2	25.6	27.8	29.8	31.7
1.50	2.92	2.80	2.70	2.61	2.54	2.47	2.40	2.35	2.29	2.18	2.05	1.93	1.83	1.68
	15.9	16.9	17.9	18.8	19.8	20.8	21.7	22.7	23.7	26.7	29.1	31.4	33.7	35.1
1.75	2.78	2.66	2.57	2.48	2.41	2.34	2.28	2.23	2.18	2.02	1.90	1.76	1.59	1.44
	17.8	18.9	20.1	21.2	22.3	23.4	24.4	25.5	26.7	29.5	32.2	34.5	35.9	37.2
2.00	2.66	2.55	2.46	2.37	2.30	2.24	2.17	2.10	2.04	1.89	1.73	1.54	1.39	1.26
	19.7	21.0	22.2	23.5	24.7	25.9	27.0	28.0	29.2	32.3	34.7	36.3	37.9	39.4
2.25	2.55	2.45	2.35	2.26	2.18	2.11	2.04	1.98	1.92	1.75	1.54	1.37	1.23	1.12
	21.6	22.9	24.2	25.5	26.7	28.0	29.1	30.3	31.6	34.6	36.3	38.1	39.8	41.6
2.50	2.44	2.33	2.23	2.15	2.07	2.00	1.94	1.88	1.82	1,58	1.38	1.23	1.11	1.01
	23.2	24.6	26.0	27.3	28.7	30.0	31.3	32.5	33.9	36.0	37.9	39.9	41.8	43.8

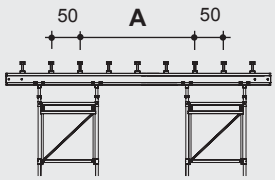


	t slab thickness [cm]													
	q total loading [kN/m²]													
	60	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
	19.0	20.5	22.1	23.7	25.2	26.8	28.3	29.9	31.3	32.6	33.9	35.2	36.5	37.8

Spacing of second. beams [m]	**L** allowable spann of secondary beam [m]													
0.20	2.84	2.77	2.70	2.64	2.59	2.54	2.49	2.45	2.40	2.37	2.33	2.30	2.26	2.23
0.33	2.40	2.34	2.28	2.23	2.18	2.12	2.06	2.00	1.96	1.92	1.88	1.85	1.81	1.75
0.40	2.26	2.20	2.13	2.06	1.99	1.93	1.88	1.83	1.76	1.69	1.62	1.56	1.51	1.46
0.50	2.05	1.97	1.90	1.84	1.75	1.64	1.55	1.47	1.41	1.35	1.30	1.25	1.21	1.17
0.63	1.84	1.71	1.59	1.49	1.40	1.31	1.24	1.18	1.13	1.08	1.04	1.00	---	---
0.67	1.74	1.61	1.49	1.39	1.31	1.23	1.16	1.10	1.06	1.01	---	---	---	---
0.75	1.55	1.43	1.33	1.24	1.16	1.10	1.04	---	---	---	---	---	---	---



b Loading widths **[m]** (b=L/2 + 0,5 m)	**A allowable span of primary beams [m]**, (double beamsh: 2 x H20 timber beams)													
	resulting loads per leg [kN]													
1.00	2.05	1.97	1.90	1.84	1.75	1.64	1.55	1.47	1.41	1.35	1.30	1.25	1.21	1.17
	29.0	30.5	32.1	33.6	34.6	35.4	36.2	36.9	37.6	38.3	38.9	39.6	40.2	40.9
1.25	1.84	1.71	1.59	1.49	1.40	1.31	1.24	1.18	1.13	1.08	1.04	1.00	---	---
	33.6	34.8	35.8	36.8	37.8	38.7	39.7	40.7	41.5	42.3	43.2	44.0	---	---
1.50	1.55	1.43	1.33	1.24	1.16	1.10	1.04	---	---	---	---	---	---	---
	36.2	37.4	38.6	39.7	40.9	42.1	43.2	---	---	---	---	---	---	---
1.75	1.33	1.22	1.14	1.06	---	---	---	---	---	---	---	---	---	---
	38.6	40.0	41.3	42.7	---	---	---	---	---	---	---	---	---	---



Deflections of beams are limited to L/500.

This loading table should be considered as general help for technical elaborations, but it does not replace a seperate statical proof of the final stability of the whole structure.

Loading assumptions according to DIN 4421:

w_f dead load for formwork = 0.25 kN/m²

w_c load of concrete = **t** [m] x 26.0 kN/m³
(weight density of concrete = 26 kN/m³

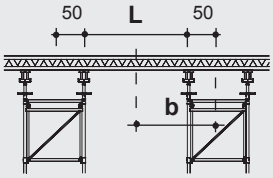
p live load = 0.20 x w_c
(minimum 1.5 kN/m², maximal 5.0 kN/m²)

Total load $q = w_f + w_c + p$ [kN/m²]

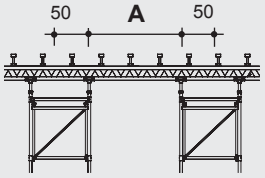
Loading Table (with R24 secondary beams and double R24 primary beams)

	t slab thickness [cm]													
	q total loading [kN/m²]													
	14	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**35**	**40**	**45**	**50**	**55**
	5.39	5.91	6.43	6.95	7.47	7.99	8.51	9.03	9.61	11.2	12.7	14.3	15.9	17.4

Spacing of second. beams [m]	**L** allowable span of secondary beam [m]													
0.20	5.33	5.03	5.03	4.74	4.74	4.44	4.44	4.14	4.14	3.85	3.85	3.55	3.55	3.55
0.33	4.44	4.44	4.14	4.14	3.85	3.85	3.55	3.55	3.55	3.26	3.26	2.96	2.96	2.96
0.40	4.14	4.14	3.85	3.85	3.55	3.55	3.55	3.26	3.26	3.26	2.96	2.96	2.66	2.66
0.50	3.85	3.85	3.55	3.55	3.26	3.26	3.26	3.26	2.96	2.96	2.66	2.66	2.37	2.37
0.63	3.55	3.55	3.26	3.26	3.26	2.96	2.96	2.96	2.96	2.66	2.37	2.37	2.37	2.07
0.67	3.55	3.26	3.26	3.26	2.96	2.96	2.96	2.96	2.66	2.66	2.37	2.37	2.07	2.07
0.75	3.55	3.26	3.26	2.96	2.96	2.96	2.66	2.66	2.66	2.37	2.37	2.07	2.07	1.78

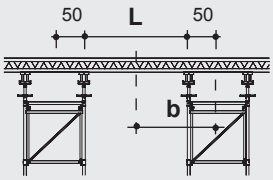


b Loading widths **[m]** (b=L/2 + 0,5 m)	**„A“ allowable span of primary beams [m]**, (double beams: 2 x R24 timber beams)													
	resulting loads per leg [kN]													
1.00	3.85	3.85	3.55	3.55	3.26	3.26	3.26	3.26	2.96	2.96	2.66	2.66	2.37	2.37
	13.1	14.3	14.6	15.8	15.9	17.0	18.1	19.2	19.0	22.1	23.3	26.2	26.7	29.3
1.25	3.55	3.55	3.26	3.26	3.26	2.96	2.96	2.96	2.96	2.66	2.37	2.37	2.37	2.07
	15.3	16.8	17.1	18.5	19.9	19.8	21.1	22.3	23.8	25.6	26.8	30.1	33.4	33.4
1.50	3.55	3.26	3.26	2.96	2.96	2.96	2.66	2.66	2.66	2.37	2.37	2.07	2.07	1.78
	18.4	18.9	20.5	20.6	22.2	23.7	23.4	24.8	26.4	28.2	32.2	32.9	36.5	36.2
1.75	3.26	2.96	2.96	2.96	2.66	2.66	2.66	2.37	2.37	2.37	2.07	2.07	1.78	1.78
	20.1	20.5	22.3	24.1	23.9	25.6	27.3	26.6	28.3	32.9	34.2	38.4	38.5	42.3
2.00	2.96	2.96	2.66	2.66	2.66	2.37	2.37	2.37	2.37	2.07	2.07	1.78	1.48	1.48
	21.3	23.4	23.6	25.5	27.4	26.9	28.7	30.4	32.4	34.3	39.1	39.7	39.3	43.2
2.25	2.96	2.66	2.66	2.66	2.37	2.37	2.37	2.07	2.07	2.07	1.78	1.48	1.48	1.18
	24.0	24.4	26.5	28.6	28.3	30.3	32.2	31.2	33.2	38.6	39.8	39.9	44.2	42.8
2.50	2.66	2.66	2.37	2.37	2.37	2.07	2.07	2.07	2.07	1.78	1.48	1.48	1.18	1.18
	24.7	27.1	27.1	29.3	31.4	30.7	32.7	34.7	36.9	38.8	39.5	44.3	43.3	47.5

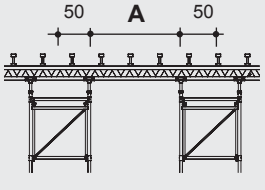


	t slab thickness [cm]													
	q total loading [kN/m²]													
	60	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
	19.0	20.5	22.1	23.7	25.2	26.8	28.3	29.9	31.3	32.6	33.9	35.2	36.5	37.8

Spacing of second. beams [m]	**L** zulässige Spannweite der Belagträger [m]													
0.20	3.26	3.26	3.26	2.96	2.96	2.96	2.96	2.96	2.66	2.66	2.66	2.66	2.66	2.66
0.33	2.66	2.66	2.66	2.66	2.37	2.37	2.37	2.37	2.07	2.07	2.07	2.07	2.07	2.07
0.40	2.66	2.37	2.37	2.37	2.07	2.07	2.07	2.07	2.07	2.07	1.78	1.78	1.78	1.78
0.50	2.37	2.07	2.07	2.07	2.07	1.78	1.78	1.78	1.78	1.48	1.48	1.48	1.18	1.18
0.63	2.07	2.07	1.78	1.78	1.78	1.48	1.48	1.18	1.18	0.89	0.89	0.89	0.89	0.59
0.67	2.07	1.78	1.78	1.48	1.48	1.18	1.18	1.18	0.89	0.89	0.89	0.59	0.59	0.59
0.75	1.78	1.78	1.48	1.48	1.18	1.18	0.89	0.89	0.59	0.59	0.59	0.59	0.59	---



b Loading widths **[m]** (b=L/2 + 0.5 m)	**A allowable span of primary beams [m]**, (double beamsh: 2 x R20 timber beams)													
	resulting loads per leg [kN]													
1.00	2.37	2.07	2.07	2.07	2.07	1.78	1.78	1.78	1.78	1.48	1.48	1.48	1.48	1.48
	31.9	31.5	33.9	36.3	38.7	37.2	39.3	41.5	43.4	40.4	42.0	43.6	45.2	46.8
1.25	2.07	2.07	1.78	1.78	1.78	1.48	1.48	1.48	1.18	1.18	1.18	1.18	1.18	1.18
	36.4	39.4	38.3	41.0	43.7	41.5	43.9	46.3	42.7	44.4	46.2	48.0	49.8	51.5
1.50	1.78	1.78	1.48	1.48	1.48	1.18	1.18	1.18	1.18	0.89	0.89	0.89	0.89	---
	39.5	42.7	41.1	44.0	46.9	43.8	46.4	49.0	51.2	46.1	47.9	49.8	51.6	---
1.75	1.48	1.48	1.18	1.18	1.18	1.18	0.89	0.89	0.89	---	---	---	---	---
	41.2	44.6	42.2	45.2	48.2	51.2	46.8	49.4	51.6	---	---	---	---	---



Deflections of beams are limited to L/500.

This loading table should be considered as general help for technical elaborations, but it does not replace a seperate statical proof of the final stability of the whole structure.

Loading assumptions according to DIN 4421:

w_f dead load for formwork = 0.25 kN/m²

w_c load of concrete = **t** [m] x 26.0 kN/m³

(weight density of concrete = 26 kN/m³

p live load = 0.20 x w_c

(minimum 1.5 kN/m², maximal 5.0 kN/m²)

Total load $q = w_f + w_c + p$ [kN/m²]

9.0 Erection and dismantling

Basic hints:

- Preassemble ID15 towers according to the required height combinations and the „sequence assembly“. Install frames and stabilizing diagonals in one vertical tower plane alternately from one lift to another.

- Adjust head and base jacks at rough extension lengths. It should be noted that the adjusted length of the head jack must have enough reserve for releasing from load when striking the towers after concreting.

- Erect preassembled towers by crane. For this, attach the crane ropes to the horizontal members of the upper frames.
  Do not use neither the ID End Frame nor the head jacks.

- Base jacks may only stand on a sturdy foundation. The allowable inclination can be of up to a maximum of 6%.

- Erect all frame supports perpendicularly before loading.

- Install bracings (scaffold tubes with couplers) if required for statical reasons or some other purpose.

- Simple auxiliary bracings or provisions against tilting of towers must generally be taken into consideration during erection and striking. Normally, it might be sufficient to install only horizontal scaffold tubes (48.3 mm dia.) which are connected to all neighbouring legs of towers by means of rigid couplers 48/48. It is advisable to provide the tubes of the bracings as close as possible to existing walls or columns (piers, etc.) for transmitting forces. Single towers must be stabilized to the ground by tubes and couplers.

- Final height adjustment (levelling) should be performed at the head jacks after placing the primary beams. The head jacks can adapt to a 6% pitch. Greater pitches have to be compensated for by means of timber wedges (hard wood).

- All aspects of the approval have to be adhered to.

- Furthermore, the „Safety Rules and Requirements for Protection of Health in Falsework and Formwork Construction“ as well as other relevant national or local regulations must be paid attention to (Germany: BBG, Doc. No. ZH 1/603).

Dismantling:

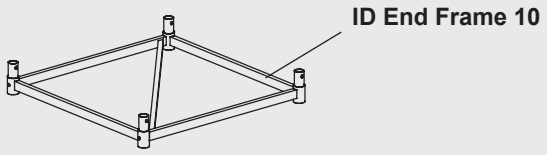
It is advisable to lower shoring systems formed by frame supports by releasing the head jacks. This is especially necessary when built-in bracings of tubes and couplers do not allow for a smooth screwing down of the base jacks. The frame supports can be dismantled after the formwork and the timber and/or steel beams have been removed from the top of the lowered towers.

Should there be no possibility of getting the towers to an opening in the slab in order to pick them up by crane and shift them out of the building area, then the towers may be dismantled in their positions.

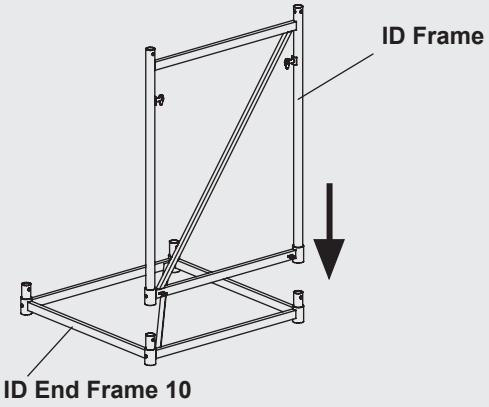
This dismantling in upright normally starts with removing the head jacks and then by taking away one component after another. The individual components can then be transported in packages to the next site of use or the storage area again.

Erection

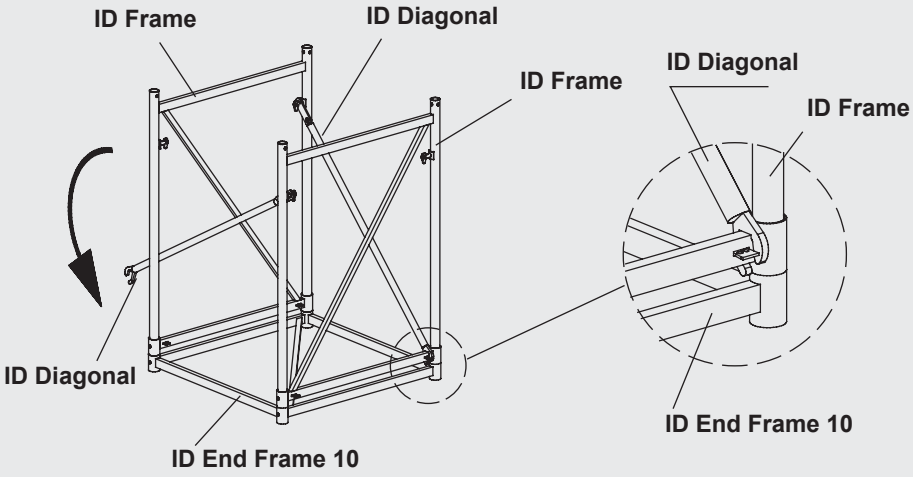
1. Lay **ID End Frame 10** on the floor-possibly on even assembly ground as near to crane as possible.



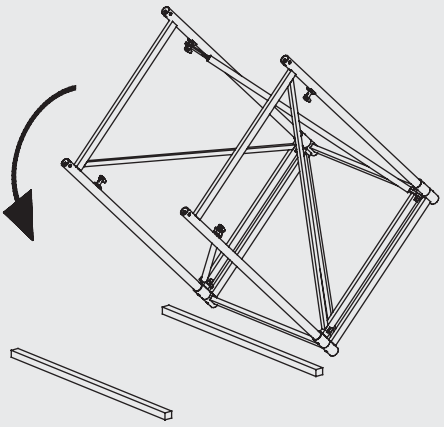
2. Stick 2 **ID Frames** onto the **ID End Frame** and look them by means of the quick-action connectors.



3. Connect the **ID Diagonal** with its lower end over the horizontal member of the **ID Frame**.



4. Turn the partly assembled unit on its side for progressing assembly.

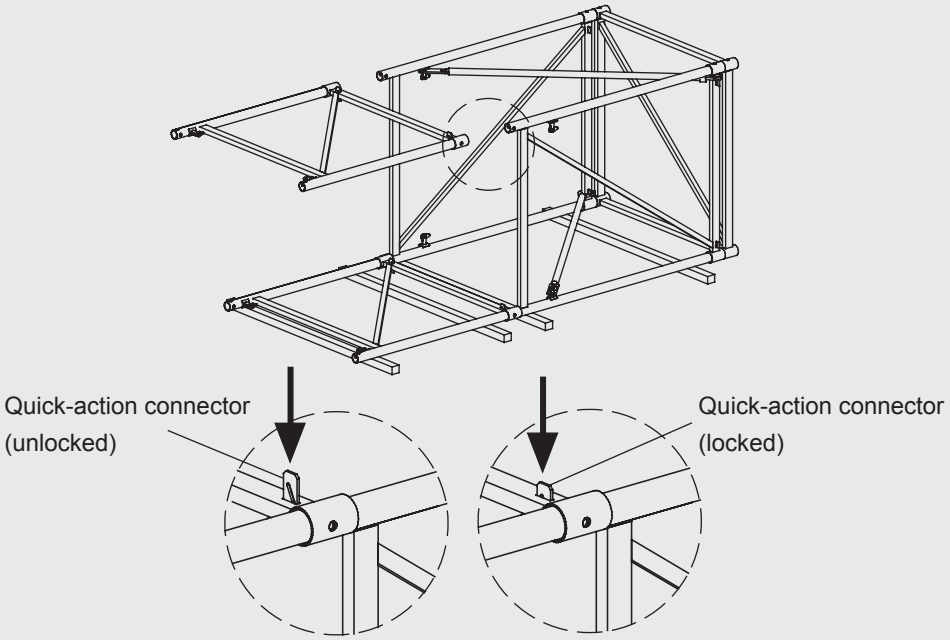


9.0 Erection and dismantling

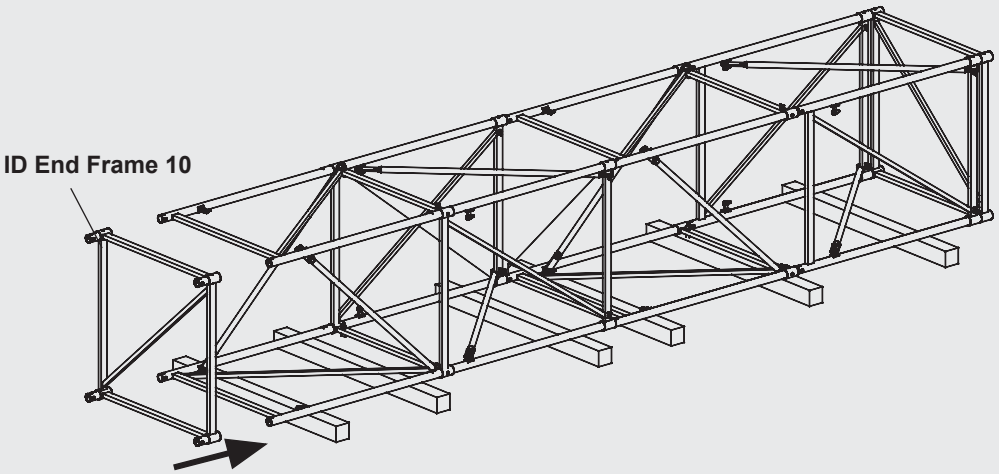
Erection

5. Stick further frames on and lock them with the quick-action connectors.

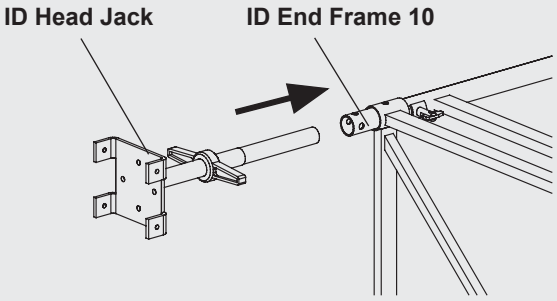
Import note:
When lifting towers by crane, make sure not to attach crane ropes or slings to the un-secured top **ID End Frame 10** but to the horizontal members of the vertical frames directly below this. Lifting towers into upright position after assembling can be performed up to maximum heights of approximately 10 m.



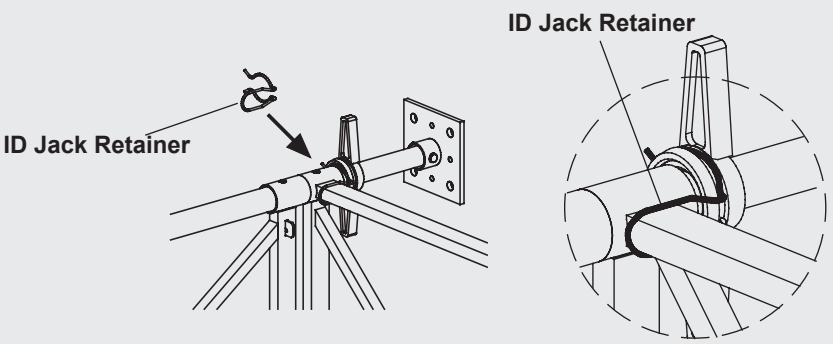
6. Attach next frames. Continue according to the before mentioned assembly procedure until the required combination height has been reached.



7. Place **ID End Frame 10** on the last two vertical Frames.



8. Insert **ID Head Jacks** into the **ID End Frame 10**.



Erection and dismantling

Assembly and disassembly have to be performed either from a mobile scaffold or from a working platform. Especially the requirements stated in the new Decree for the Reliability of Operation (dated Sept. 27, 2002) and the existing Safety Rules for Protection of Health in Falsework and Formwork Construction (UVV) must be adhered to.

Step1: Dismantling starts by lowering the Head Jacks.

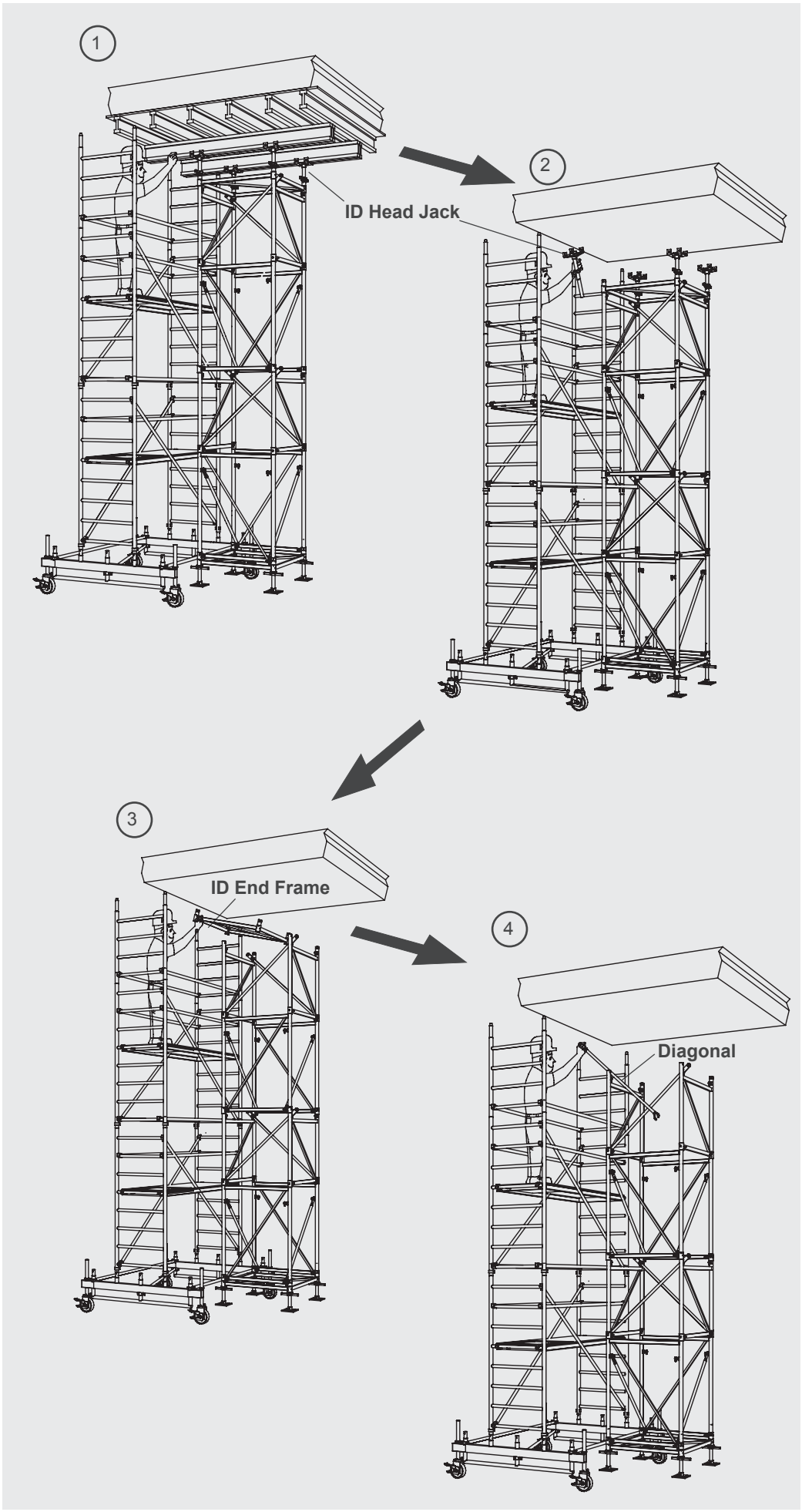
The supported slab formwork has to be striked (removed) in accordance with the relevant Instructions for Assembly and Use of the formwork system applied.

Disassembly of ...

... the Head Jacks (Step 2)

... the ID End Frame (Step 3)

... the Diagonals (Step 4).

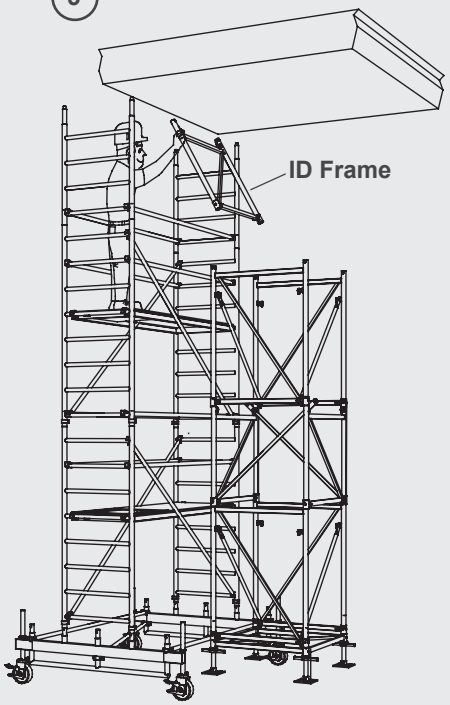


9.0 Erection and dismantling

Disassembly ...

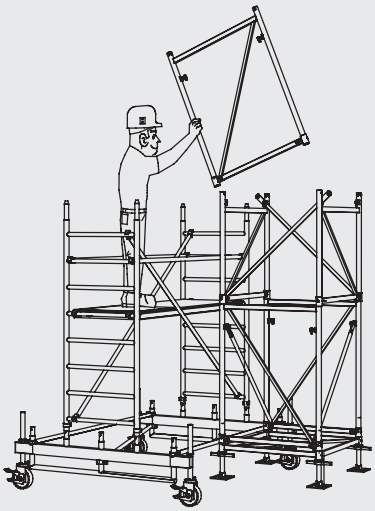
... of the Frames **(Step 5)**

5



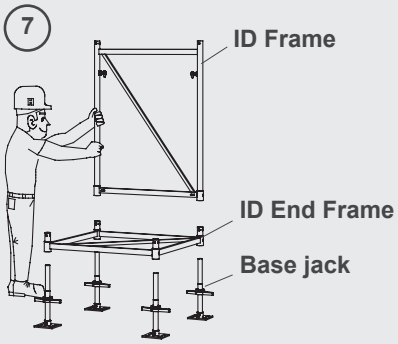
The working height of the mobile scaffold has to be adapted to the required height for all operations during erection and disassembly **(Step 6).**

6



After removing the last two vertical Frames at the bottom, the ID End Frame can easily be lifted and taken away from the 4 Base Jacks **(Step 7).**

7



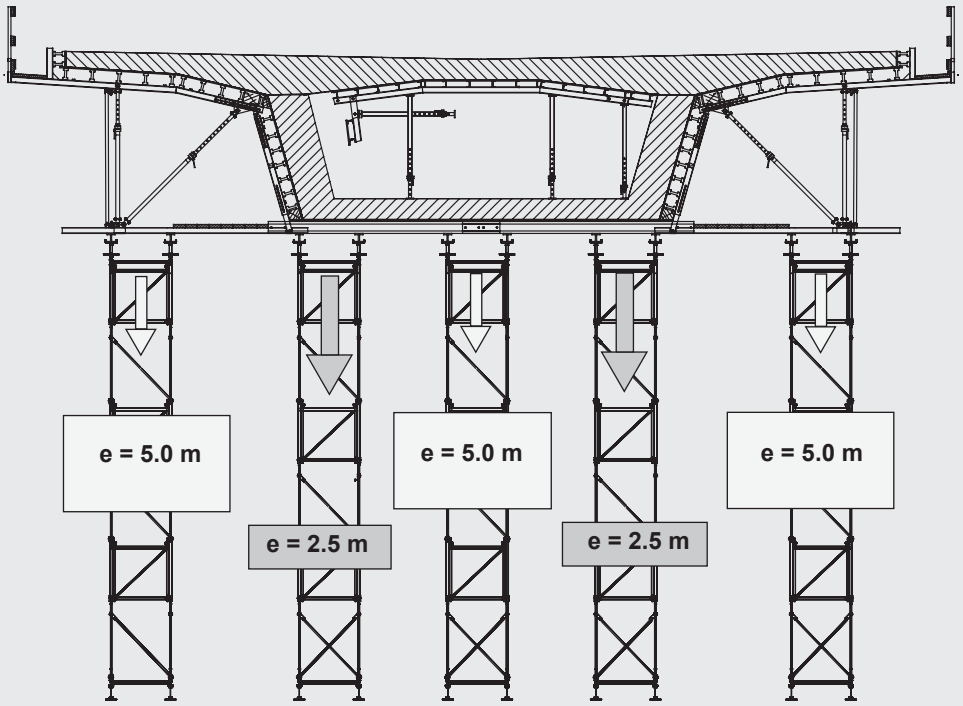
Distances in longitudinal and transverse direction of towers according to vertical loads (V) on supports as stated in the statical computation.

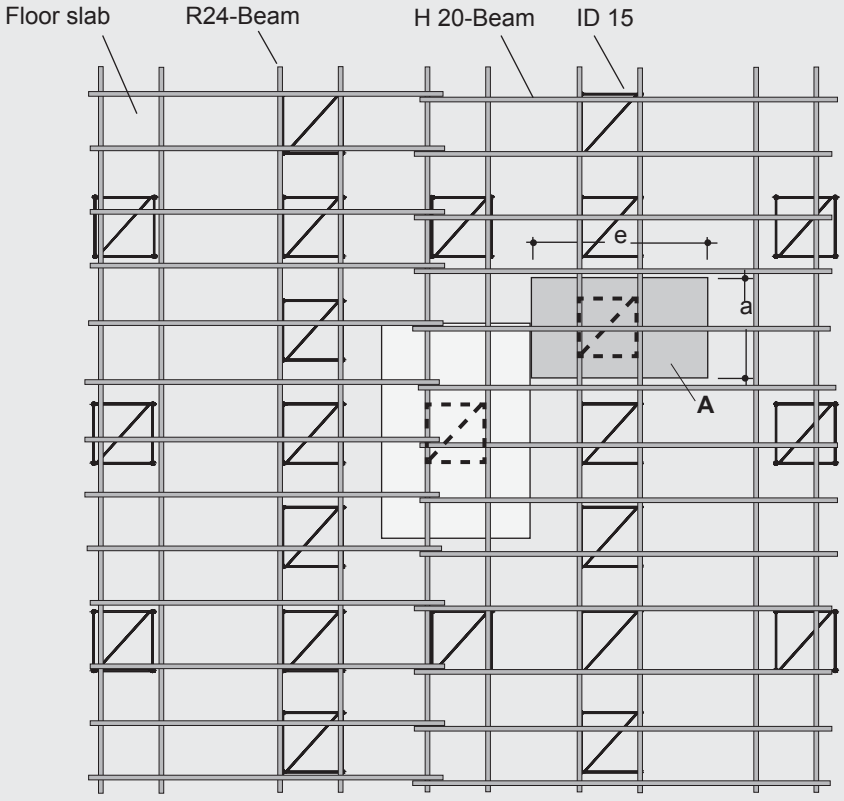
Assumptions (V-loads):
Dead load of concrete, dead load of formwork, live load.

Horizontal loads from wind pressure and V/100 require bracings between towers for reasons of stability of the falsework.
(scaffold tubes & couplers)

(**here**: arrangement of towers without bracings)

Typical application in bridge construction (example)

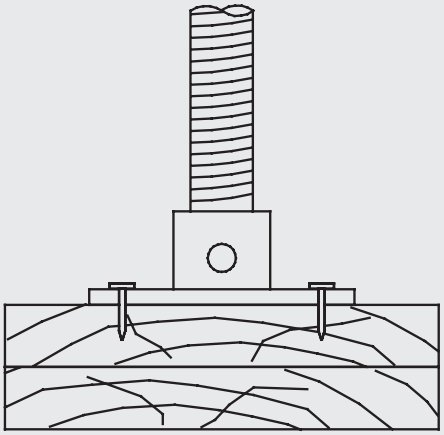




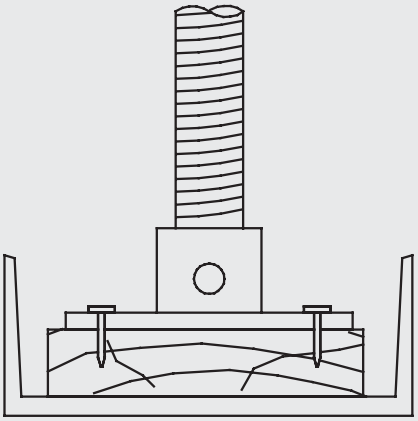
A = a · e

10.0 Application examples

Shifting variants

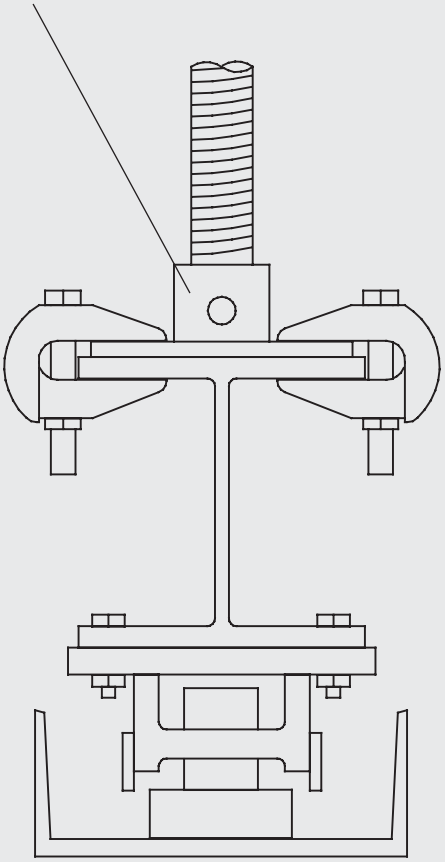


Planks



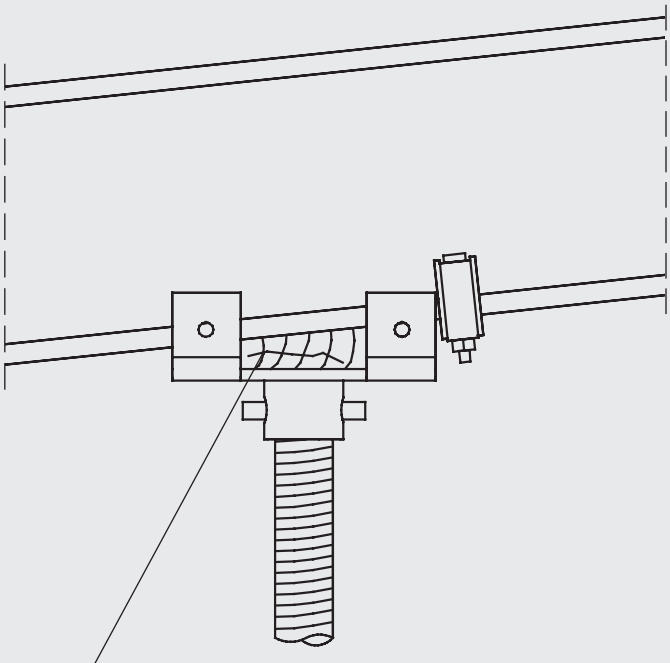
Plank guided in U-channel

if possible use Base Piece rigid



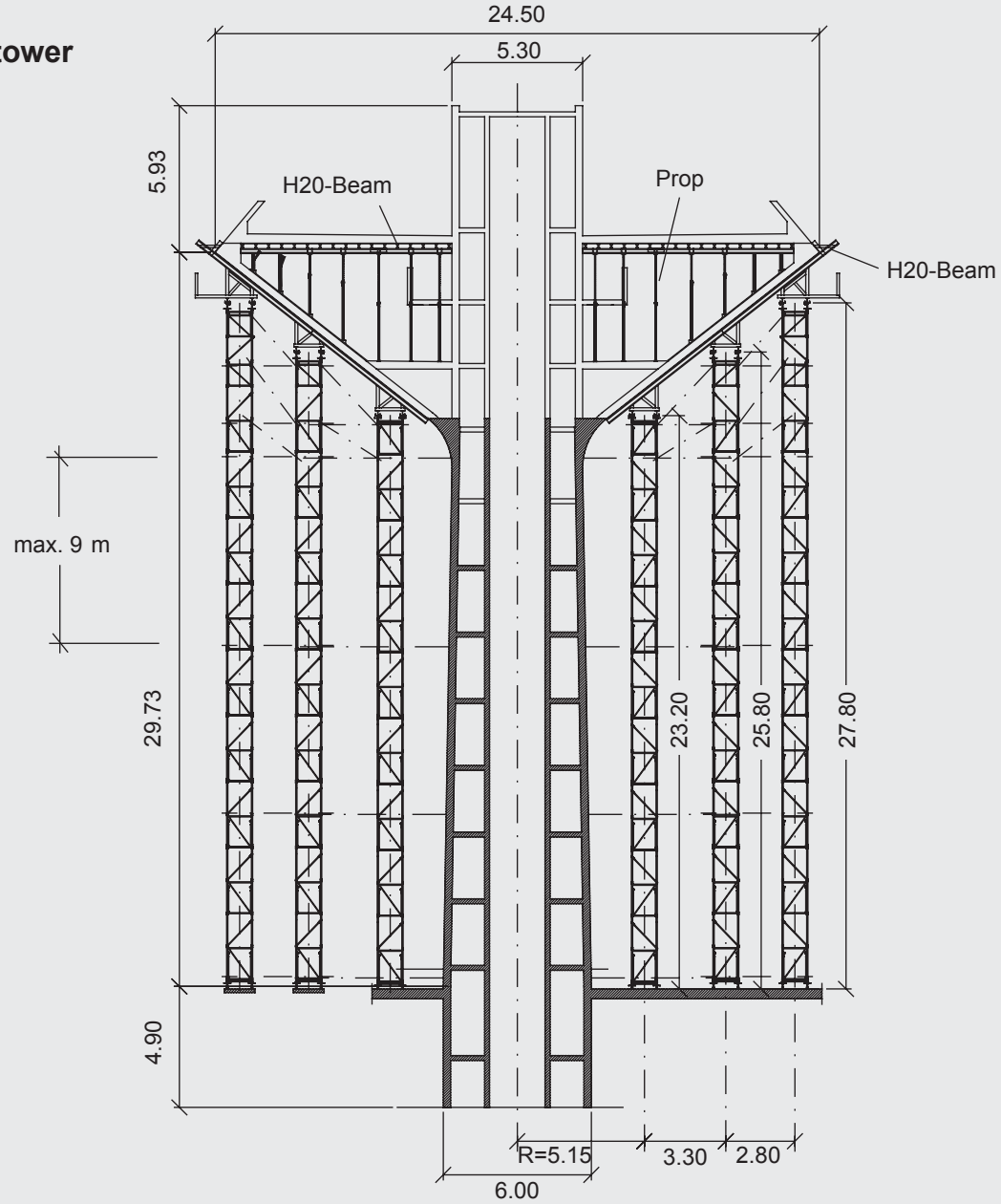
Load-distributing steel beam on shifting skates guided in U-channel.

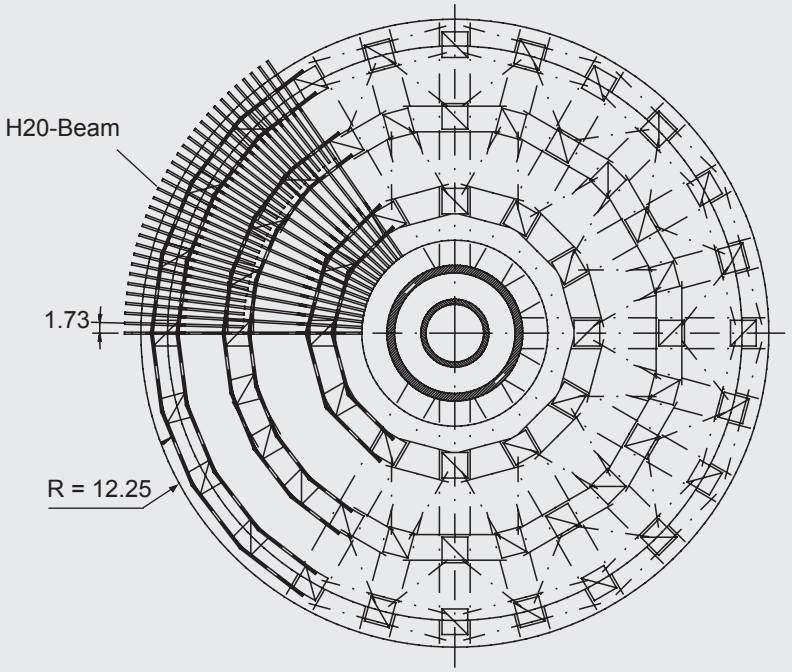
The Head Plate adapts to slopes of up to 6%



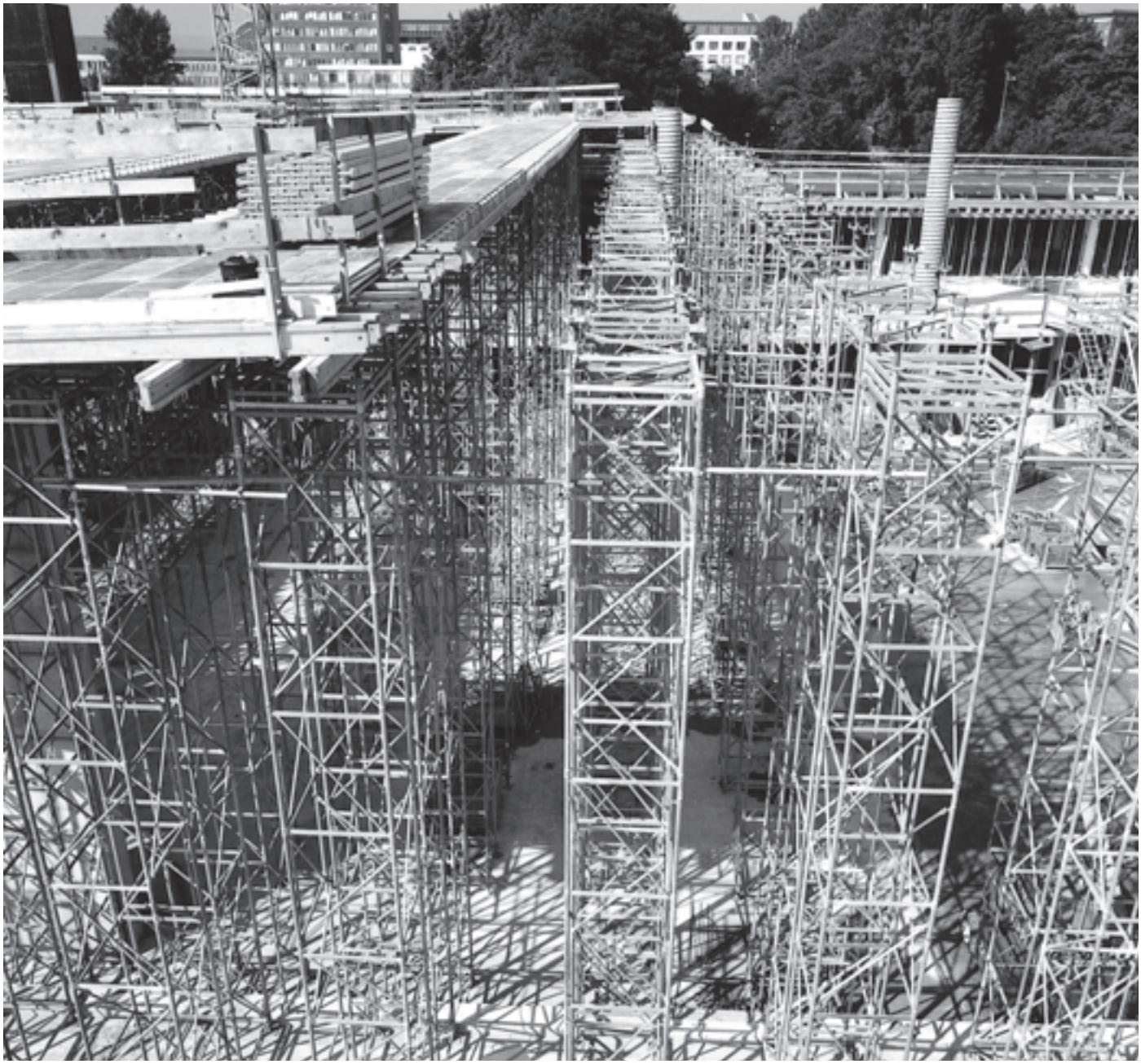
Timber wedge for compensating slope of primary beam (e. g. timber beam or steel beam)

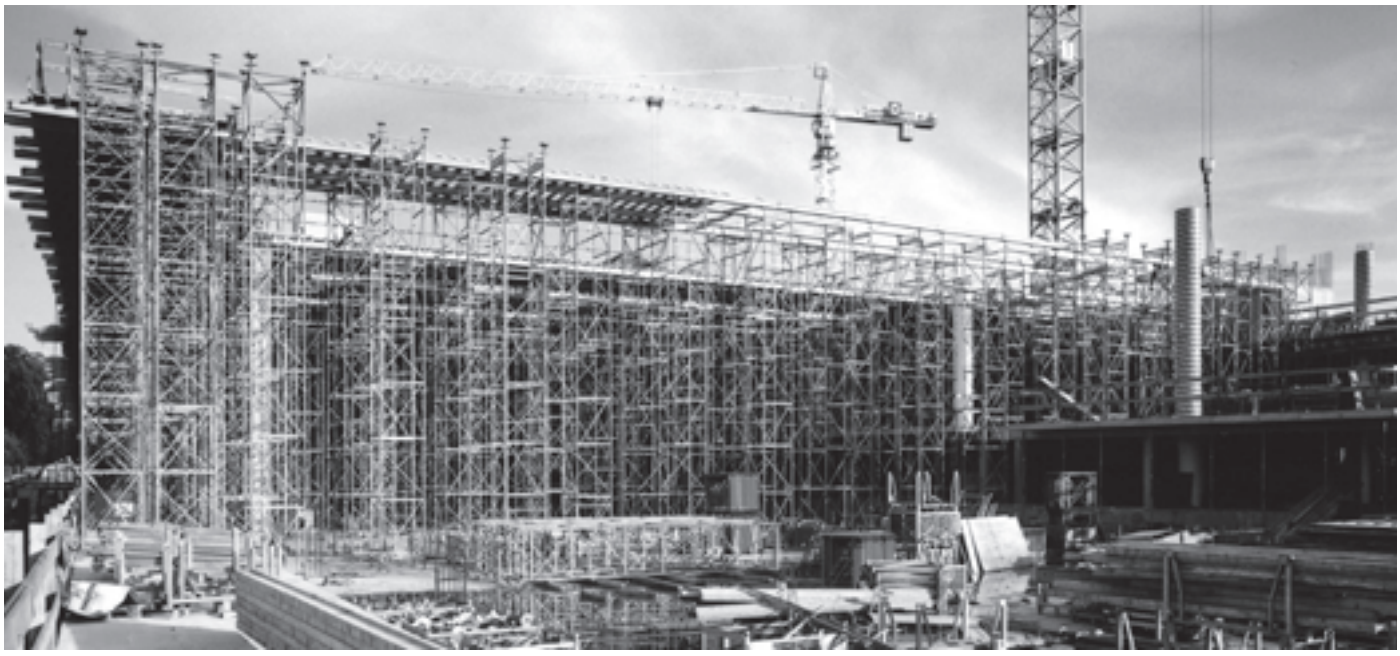
Water tower

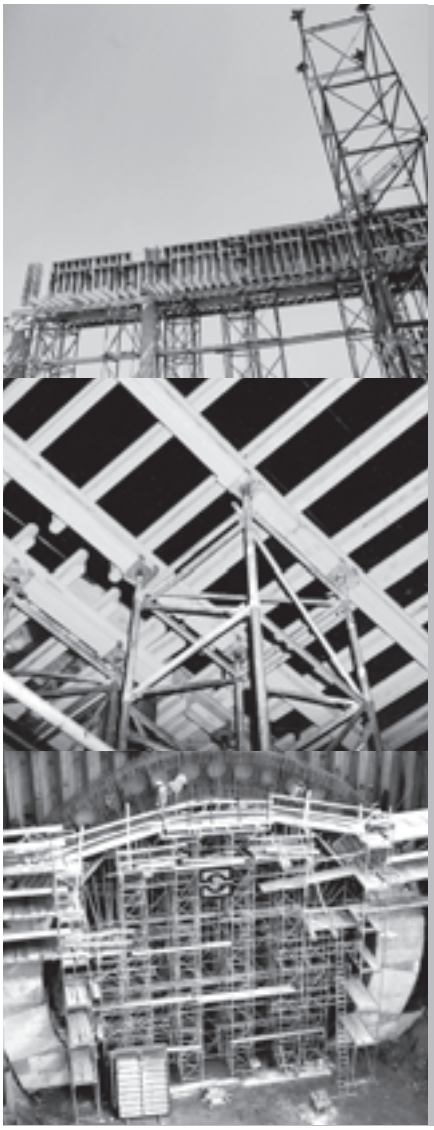

24.50
5.30
5.93
H20-Beam
Prop
H20-Beam
max. 9 m
29.73
23.20
25.80
27.80
4.90
R=5.15
3.30
2.80
6.00


H20-Beam
1.73
R = 12.25

11.0 Construction sites







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