

# **TOPFLEX**

## Slab formwork

### User guide



**HÜNNEBECK** 

BY BRAND  SAFWAY

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## 1 Product features

In combination with tubular steel props, tripod stands, fork heads and shuttering panels, the H 20 beams provide flexible, yet cost-effective slab formwork for any ground-plan, slab thickness and room height.

The H 20 timber beam is especially practical due to its low weight (5.0 kg/m), its good statical figures, and its exacting workmanship in details.

A very long duration of life is assured by its high-grade bonding and its rounded beam ends.

The H 20 timber has a general approval by the building supervisory board.

### 1.1 This user guide

This user guide contains important information on the assembly and use of HÜNNEBECK TOPFLEX slab formwork, as well as on the precautions required for safe assembly and use. This user guide is intended to assist you in working effectively with TOPFLEX. Please therefore read this user guide carefully before assembling and using TOPFLEX, keep it handy at all times and archive it as a reference work.

The contents and processes described are in accordance with the legal and occupational safety regulations of Germany and Austria. Hünnebeck assumes no liability for deviations from the contents and processes described or for use outside this area of application.

### 1.2 Intended use

TOPFLEX slab formwork is used for creating concrete slabs of any thickness. The formwork is constructed on site using a combination of H 20 beams, tubular steel props and formwork panels as well as other components. The formwork must always be secured against horizontal loads by means of suitable measures, e.g. by anchoring it to suitable fixed anchoring points. HÜNNEBECK products are intended exclusively for commercial use by technically suitable users.

### 1.3 Safety instructions

#### **Important information regarding the intended use and safe application of formwork and falsework**

The contractor is responsible for drawing up a comprehensive risk assessment and a set of installation instructions. The latter is not usually identical to the user guide.

- Risk assessment  
The contractor is responsible for the assembly, the documentation, implementation and revision of a risk assessment for each construction site. Employees are obliged to implement the measures resulting from this in accordance with all legal requirements.
- Installation instructions  
The contractor is responsible for compiling a written set of installation instructions. The user guide forms part of the basis for the compilation of a set of installation instructions.

- **User guide**

Formwork and falsework are technical work equipment that is intended for commercial use only. The product must be used as intended exclusively by properly trained personnel and appropriately qualified supervisory personnel. The user guide is an integral component of the formwork construction. It comprises minimum safety guidelines, details on the standard configuration and intended use as well as the system description.

The functional instructions (standard configuration) contained in the user guide are to be complied with as stated. Enhancements, deviations or changes represent a potential risk and therefore require separate verification (with the help of a risk assessment) or a set of installation instructions that comply with the relevant laws, standards and safety regulations. The same applies in those cases where formwork and/or falsework components are provided by the contractor.
- **Availability of the user guide**

The contractor has to ensure that the user guide provided by the manufacturer are available on site at all times. Before the assembly and use the site personnel has to be familiar with the user guide and the user guide must be readable and complete. Replacements can be obtained from HÜNNEBECK.
- **Illustrations**

The illustrations shown in the user guide are, in part, situations of assembly and not always complete in terms of safety considerations. Nevertheless, any required safety installations not shown in these illustrations must be available.
- **Storage and transportation**

The special requirements of the respective formwork constructions regarding transportation procedures as well as storage must be complied with. For example, the appropriate lifting gear should be indicated.
- **Material check**


Formwork and falsework material deliveries are to be checked on arrival at the construction site/place of destination as well as before each use to ensure that they are in perfect condition and function correctly. Changes to the formwork materials are not permitted.
- **Spare parts and repairs**


Only original components may be used as spare parts. Repairs are to be carried out by the manufacturer or authorized repair facilities only.
- **Use of other products**


Combining formwork or falsework components from different manufacturers carries certain risks. They are to be individually verified and may result in the compilation of a separate set of assembly instructions required for the installation of the equipment.

- Safety warnings, notes and Visual check  
The individual safety messages or notes and the Visual check are to be complied with.


**Examples:**

 <b>DANGER</b>	<b>DANGER!</b> DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
---	---

 <b>WARNING</b>	<b>WARNING!</b> WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
--	--

 <b>CAUTION</b>	<b>CAUTION!</b> CAUTION used with the safety alert symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
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<b>NOTE</b>	<b>NOTE</b> NOTE refers to practices not related to personal injury.
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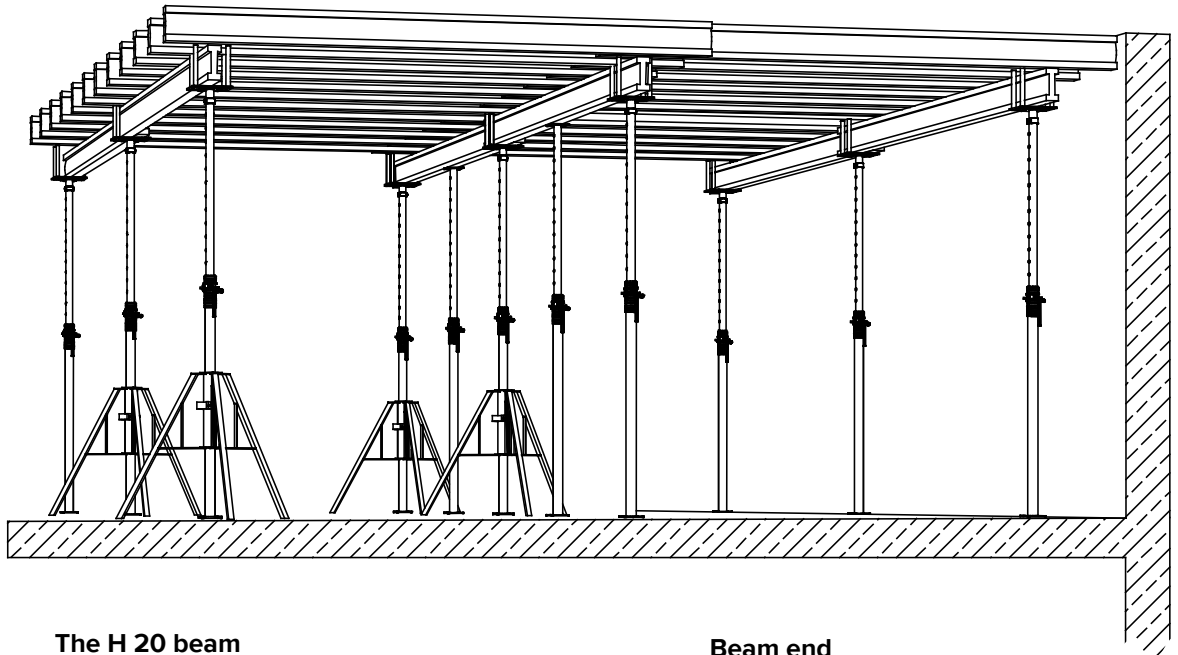
 <b>Visual check</b>	Visual check refers to a Visual check and is not related to personal injury.
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- Miscellaneous  
Technical improvements and modifications are subject to change without note. For the safety-related application and use of the products all current country-specific laws, standards and other safety regulations are to be complied with without exception. They form a part of the obligations of employers and employees regarding industrial work safety. This results in, among other things, the responsibility of the contractor to ensure the stability of the formwork and falsework constructions as well as the structure during all stages of construction. This also includes the basic assembly, disassembly and the transport of the formwork and falsework constructions or their components. The complete construction is to be checked during and after assembly.

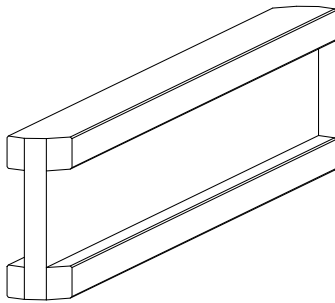
Copyright:

Güteschutzverband Betonschalungen e.V.  
PO-Box 10 41 60  
40855 RATINGEN  
GERMANY

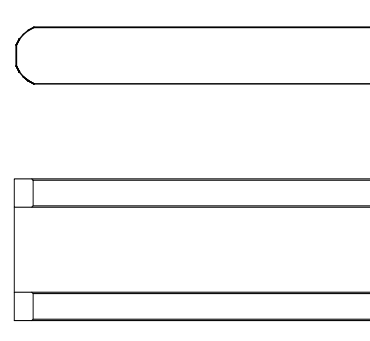
## 2 Overview



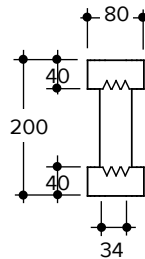
The H 20 beam



Beam end



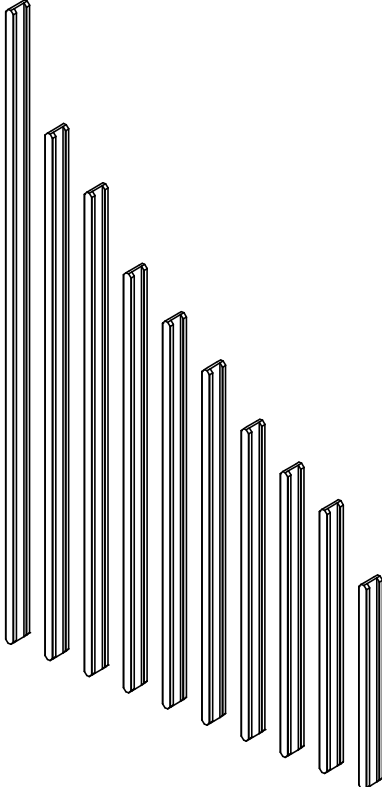
Cross section



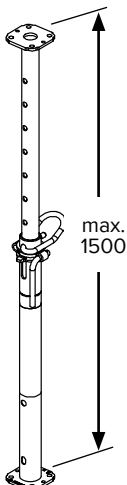
Practical accessory items make TOPFLEX slab formwork even faster and more efficient. The tripod stand, for example, makes it easier to erect the props.

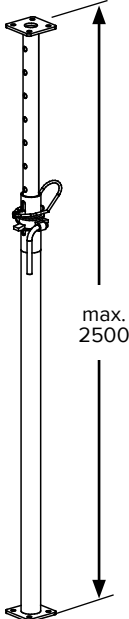
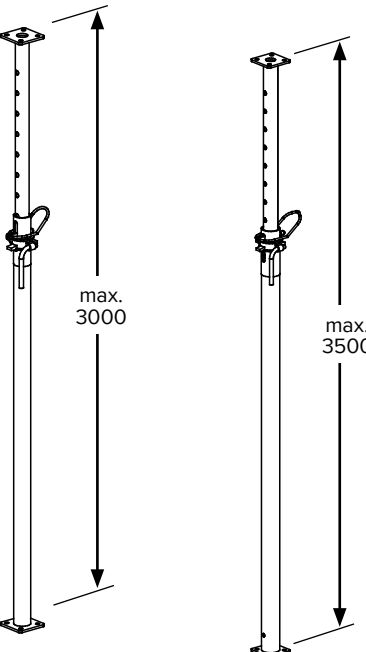
Striking is made easier by lowering the shuttering plane by about 6 cm using the adjustment nut of the steel props. With the space which results from the first lowering and by tilting the timber beams, the shuttering material can be systematically removed, while going easy on materials.

### 3 Components

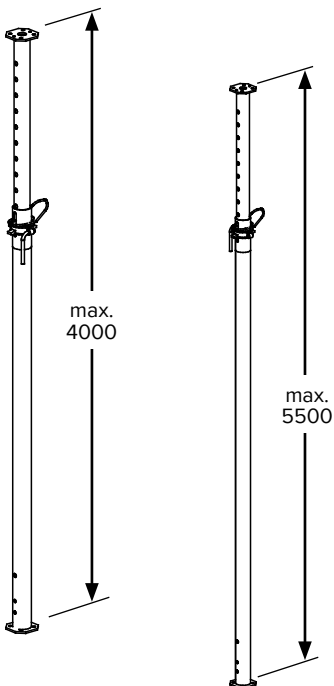
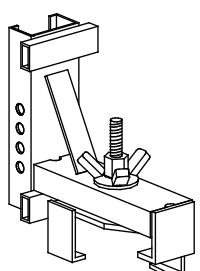
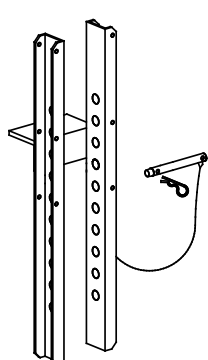

	Component	Product code	Weight [kg]
	H 20 K-Beam 190	603190	8.74
	H 20 K-Beam 245	603191	12.27
	H 20 K-Beam 265	603192	12.19
	H 20 K-Beam 290	603193	13.34
	H 20 K-Beam 330	603194	15.18
	H 20 K-Beam 360	603195	16.56
	H 20 K-Beam 390	603196	17.94
	H 20 K-Beam 450	603197	20.70
	H 20 K-Beam 490	603198	22.54
	H 20 K-Beam 590	603199	27.14
	H 20 K-Beam per running meter	581862	4.60

Timber formwork beams with a height of 20 cm and a width of 8 cm.  
 The H 20 beam is approved for the following static figures:  
 perm. M = 5.00 kNm  
 perm. Q = 11.00 kN  
 The stiffness amounts:  $E \cdot I = 500 \text{ kNm}^2$   
 Complies with the regulations of EN 13377:2002-11

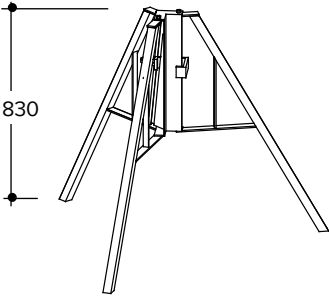
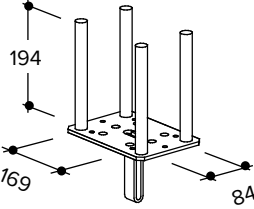
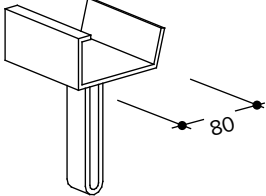
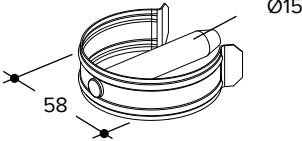
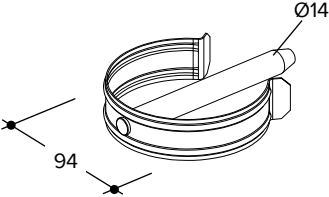
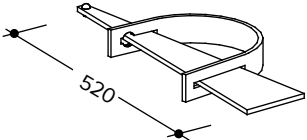
	<p>All steel props are provided with a quick-lowering mechanism, anti-crush guard and a protection against dropping-out of the inner tube and are also protected for a long service-life by hot-dip galvanization.                  *accord. to DIN EN 1065</p>		
	<p><b>EUROPLUS new 30 - 150</b></p> <p>Extension range from 1.04 m - 1.50 m.                  Perm load* in system-bound use see page 32. Perm load*: 30 kN as single prop.</p>	<b>601460</b>	<b>10.68</b>

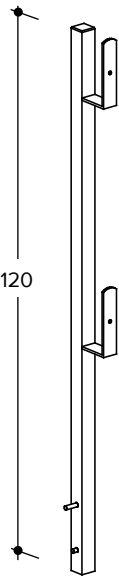
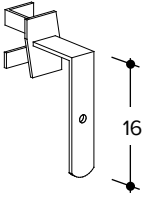
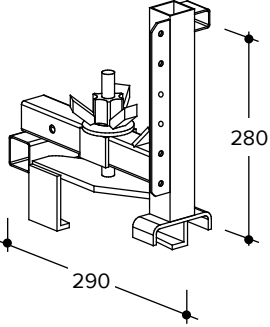
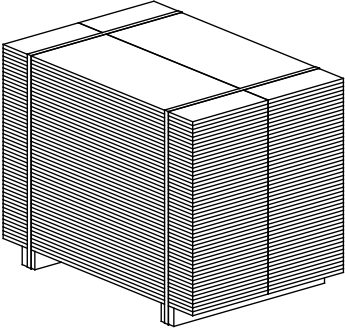
	Component	Product code	Weight [kg]
	<p><b>EUROPLUS new 20 - 250</b>            Extension range from 1.47 m - 2.50 m.            Perm load* in system-bound use see page 32. Perm load: 20 kN as single prop.</p>	<p><b>601390</b></p>	<p><b>13.15</b></p>
	<p><b>EUROPLUS new 30 - 250</b>            Extension range from 1.47 m - 2.50 m.            Perm load* in system-bound use see page 32 .Perm load: 30 kN as single prop.            *accord. to DIN EN 1065</p>	<p><b>601430</b></p>	<p><b>16.19</b></p>
	<p><b>EUROPLUS new 20 - 300</b>            Extension range from 1.72 m - 3.00 m.            Perm load* in system-bound use see page 32. Perm load: 20 kN as single prop.</p>	<p><b>601400</b></p>	<p><b>16.82</b></p>
	<p><b>EUROPLUS new 30 - 300</b>            Extension range from 1.72 m - 3.00 m.            Perm load* in system-bound use see page 32. Perm load: 30 kN as single prop.</p>	<p><b>601440</b></p>	<p><b>19.17</b></p>
	<p><b>EUROPLUS new 20 - 350</b>            Extension range from 1.98 m - 3.50 m.            Perm load* in system-bound use see page 32. Perm load: 20 kN as single prop.</p>	<p><b>601410</b></p>	<p><b>20.52</b></p>
	<p><b>EUROPLUS new 30 - 350</b>            Extension range from 1.98 m - 3.50 m.            Perm load* in system-bound use see page 32. Perm load: 30 kN as single prop.            *accord. to DIN EN 1065</p>	<p><b>601445</b></p>	<p><b>24.24</b></p>

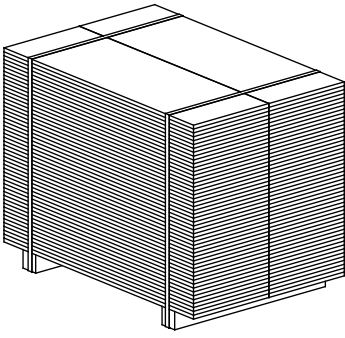
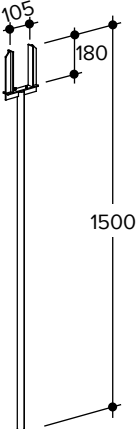
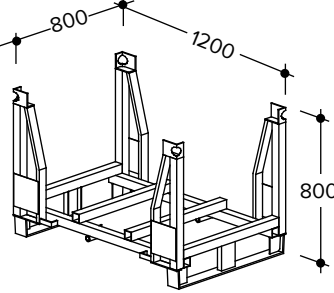

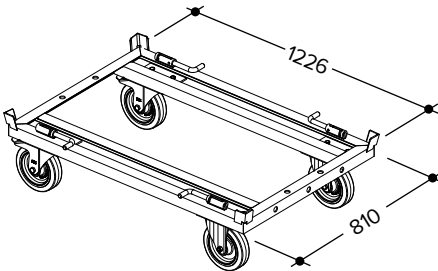


	Component	Product code	Weight [kg]
	<p><b>EUROPLUS new 20 - 400</b>            Extension range from 2.24 m - 4.00 m.            Perm load in system-bound use see page 32. Perm load: 20 kN as single prop.</p>	<p><b>601415</b></p>	<p><b>23.79</b></p>
	<p><b>EUROPLUS new 30 - 400</b>            Extension range from 2.24 m - 4.00 m.            Perm load in system-bound use see page 32. Perm load: 20 kN as single prop.</p>	<p><b>601450</b></p>	<p><b>28.75</b></p>
	<p><b>EUROPLUS new 20 - 550</b>            Extension range from 3.03 m - 5.50 m.            Perm load in system-bound use see page 32. Perm load: 20 kN as single prop.</p>	<p><b>601425</b></p>	<p><b>36.07</b></p>
	<p><b>Joist clamping connector</b>            The zinc coated Joist clamping connector allows to shutter beam formwork with H 20 beams. The connector is clamped stepless to the upper belt of the beams.            Maximum slab load per each joist clamping connector: 6.5 kN!</p>	<p><b>496469</b></p>	<p><b>6.50</b></p>
	<p><b>Adjustable fixing beam 500</b>            The zinc coated adjustable fixing beam 500 allows the height adjustment of a beam formwork with a joist clamping connector (part. no.: 496469). The undetachably fastening bolt allows an adjustment in 1 cm steps.            (See pages 19 et seq.)</p>	<p><b>496458</b></p>	<p><b>4.54</b></p>
	<p><b>Triangular fillet</b>            This profile can be clamped on the edge of a 21 mm thick shuttering sheet. It breaks the sharp concrete edge by about 2 x 2 cm.</p>	<p><b>547555</b></p>	<p><b>0.45</b></p>

## 3.1 Accessories

	Component	Part code	Weight [kg]
	<p><b>Tripod galv.</b></p> <p>Simplifies the erection of the EUROPLUS steel props and the Alu 500DC aluminium prop (inner tube down).</p> <p>Min. Ø 57 mm, max. Ø 90 mm (see page 14).</p>	587377	11.83
<p><b>WARNING!</b> The Tripod may only be used as an installation aid! It does not replace the necessary measures to transfer the H loads from formwork, wind, concreting, etc. into the structure of the building!</p>			
	<p><b>Fork head 8/20</b></p> <p>Secures the H 20 beams and H24 beams which serve as primary beams on the fork head plate from falling (See page 14). Is secured in the prop with the TOPEC-bolt or TOPEC bolt D14, depending on the type of strut.</p> <p>Order 1 x additional TOPEC-bolt for this purpose.</p>	417565	2.96
	<p><b>Steel prop hanger 8</b></p> <p>Helps to attach an additional prop to the H 20 beam (see page 14). Is secured in the prop with the TOPEC-bolt or TOPEC bolt D14, depending on the type of strut.</p> <p>Order 1 x additional TOPEC-bolt for this purpose.</p>	510749	1.20
	<p><b>TOPEC-Bolt</b></p> <p>Can be used at the inner tube of the EUROPLUS-props 260. 300 and 350 DB/ DIN. See page 18.</p> <p>For tube diameter ≤ 63,5mm</p>	470804	0.15
	<p><b>TOPEC-Bolt D14</b></p> <p>Can be used at the inner tube of the EUROPLUS-props 400 EC and 550 DC. Also usable with the ALU 500 DC prop.</p> <p>For tube diameter ≤ 76,1 mm–88,9 mm.</p>	604365	0.15
	<p><b>Euro Bracing clamp</b></p> <p>Attaches stiffening shutterboards to any tubular steel props.</p> <p>For max. board thickness of 3 x 12 cm).</p>	573810	1.83

	Component	Part code	Weight [kg]
	<p><b>PROTECTO - Railing post</b></p> <p>The railing post is the principle item of the PROTECTO system. It can be used either with a board railing or with the PROTECTO protective grating. When being inserted into one of the various holding devices, it will automatically be fixed by way of the built-in locking mechanism. The railing post is durably protected against corrosion by hot-dip galvanizing.</p>	<p><b>601225</b></p>	<p><b>3.65</b></p>
	<p><b>PROTECTO - Toe board retainer</b></p> <p>This item serves as a supplementary part to the railing post and secures the toe board of the board railing. The PROTECTO toe board retainer can even be attached to the railing post afterwards.</p>	<p><b>601227</b></p>	<p><b>0.69</b></p>
	<p><b>PROTECTO - Timber beam connector</b></p> <p>A connecting part and holding device for the PROTECTO - Railing post on standard timber beams with heights of 20 or 24 cm. At the same time it is also applicable as support for the stopend of the slab formwork. Nail holes are provided in the integrated plate for nailing purposes. The beam connector can simply be assembled by tightening the wing nut of the clamping part with a hammer. It may also be used on timber beams arranged vertically (e.g. wall formwork).</p>	<p><b>601291</b></p>	<p><b>4.20</b></p>
	<p><b>3-S-Shuttering panels 150 <sup>1)</sup></b></p> <p>100 panels, 75 m<sup>2</sup></p> <p>According to DIN 18215.</p> <p>Thickness 21 mm, L = 1.50 m, W = 0.50 m.</p>	<p><b>569708</b></p>	<p><b>800.00</b></p>

	Component	Part code	Weight [kg]
	<p><b>3-S-Shuttering panels 200 <sup>1)</sup></b>            100 panels, 100 m<sup>2</sup>            According to DIN 18215.            Thickness 21 mm, L = 2.00 m, W = 0.50 m.</p>	<p><b>569719</b></p>	<p><b>1060.00</b></p>
	<p><b>Assembly fork</b>            Simplifies the laying and removal of H 20 shuttering beams (see page 15).</p>	<p><b>510554</b></p>	<p><b>3.51</b></p>
	<p><b>Euro stacking frame 120/80</b>            Steel, hot-dip galvanized.            For storing and transporting scaffolding and formwork materials. A maximum of 6 frames can be stacked (see page 35).            Load-bearing capacity: 1,200 kg</p>	<p><b>553689</b></p>	<p><b>54.47</b></p>
<p> <b>WARNING</b> <b>Warning!</b> Pay attention to the operating instruction of the Euro stacking frame!</p>			
	<p><b>Euro Trolley</b>            For manual transport of lattice boxes and stacking frames. The Euro Trolley can be firmly connected to the mesh boxes and stacking frames by means of the lock and then lifted by crane (see page 35).            The Euro Trolley has 2 lockable castors.            Load-bearing capacity: 1,300 kg</p>	<p><b>607610</b></p>	<p><b>39,52</b></p>

## 4 Assembly

A standard assembly of a TOPFLEX formwork consists of:

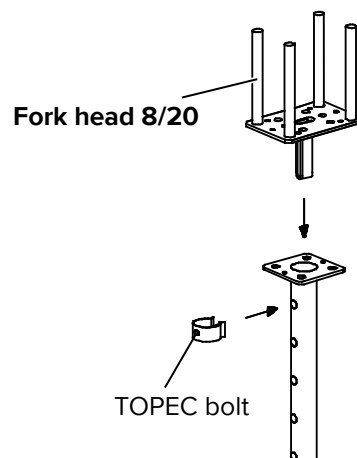
- Tubular steel props with Fork heads 8/20 (main props)
- Tubular steel props with Steel prop hanger (intermediate props)
- Primary beams
- Secondary beams
- Shuttering panels
- Bracing or tying of the formwork

TOPFLEX formwork is always assembled from a wall corner completely from the floor. If there is no wall corner, you must stabilise the formwork with suitable aids, e.g. using a scaffold tower.

### 4.1 Preparing tubular steel props

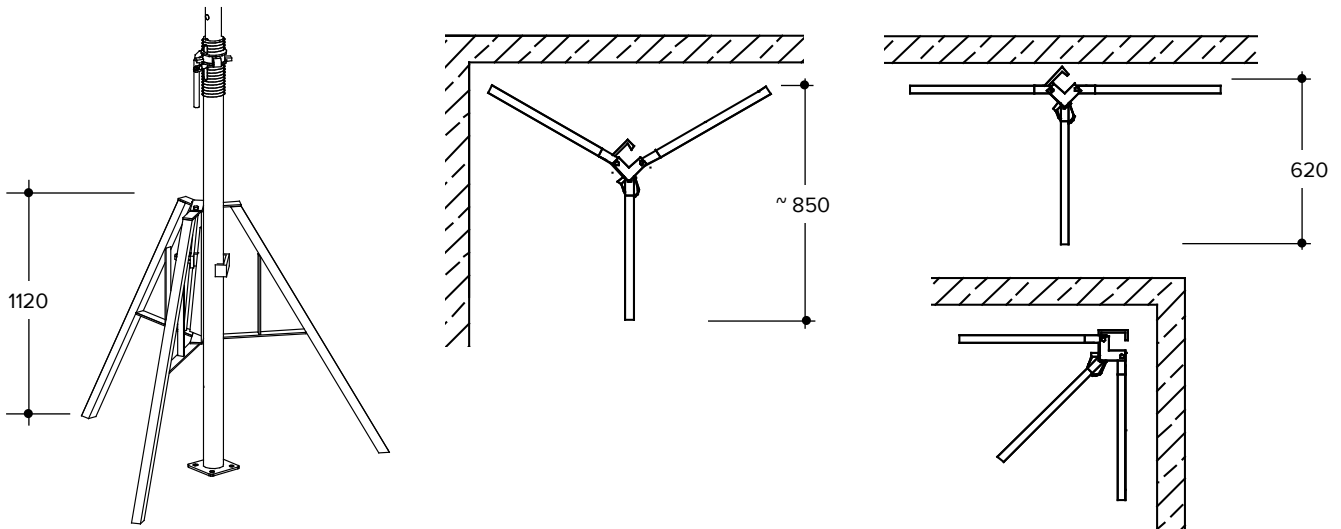
#### 4.1.1 Inserting fork heads 8/20

The fork heads 8/20 fix the H 20 beams on the tubular steel props. The fork heads are inserted into the top of the tubular steel props. The fork heads must be secured with a TOPEC bolt each. The fork head 8/20 can be turned in two directions. In the first direction a single H 20 beam can be placed on the fork head. When turned by 90°, two H 20 beams can be placed on the fork head side by side and be tied together.



## 4.1.2 Using props with tripod

The tripod galv. makes it easier to set up the tubular steel props during erection. The prop is simply set in the open stand and secured through the clamping loop with a gentle blow of the hammer. The tripod galv. can be used with nearly all types of props (except Alu-Top). The flexibly mounted supporting legs of the Tripod galv. permit an optimal fit, even in the corners of the structure.



### WARNING

#### Warning!

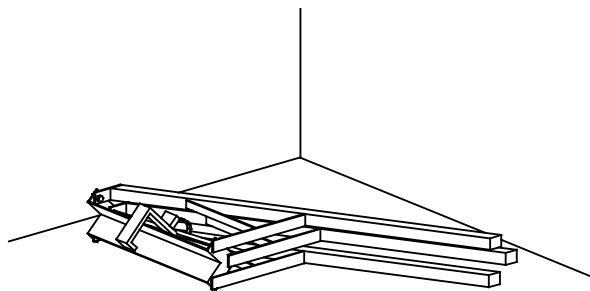
The tripod may only be used as an installation aid! It does not replace the necessary measures to transfer the H loads from formwork, wind, concreting, etc. into the structure of the building!

### NOTE

#### Note!

After the slab formwork has been completely erected and secured against H loads, the tripod can be removed and taken to the next assembly site.

The tripod can be folded to save space.



## 4.2 Erecting formwork

Erection of the TOPFLEX formwork begins with setting up the primary beams. For each joint and each end of a primary beam you need a tubular steel prop with a tripod and a fork head. Then you place the primary beam and the secondary beam with the help of the mounting forks. The shuttering panels are placed from a safe position on the secondary beam, e.g. from a mobile scaffold or a platform ladder.



### DANGER

#### Formwork collapses!

Props and formwork cannot support horizontal loads if they are not secured by further measures! If you load unsecured formwork horizontally, e.g. by wind, material, persons or during concreting, the formwork will collapse. This can seriously injure or kill people! Always secure the formwork and props sufficiently against H loads!



### WARNING

#### Warning!

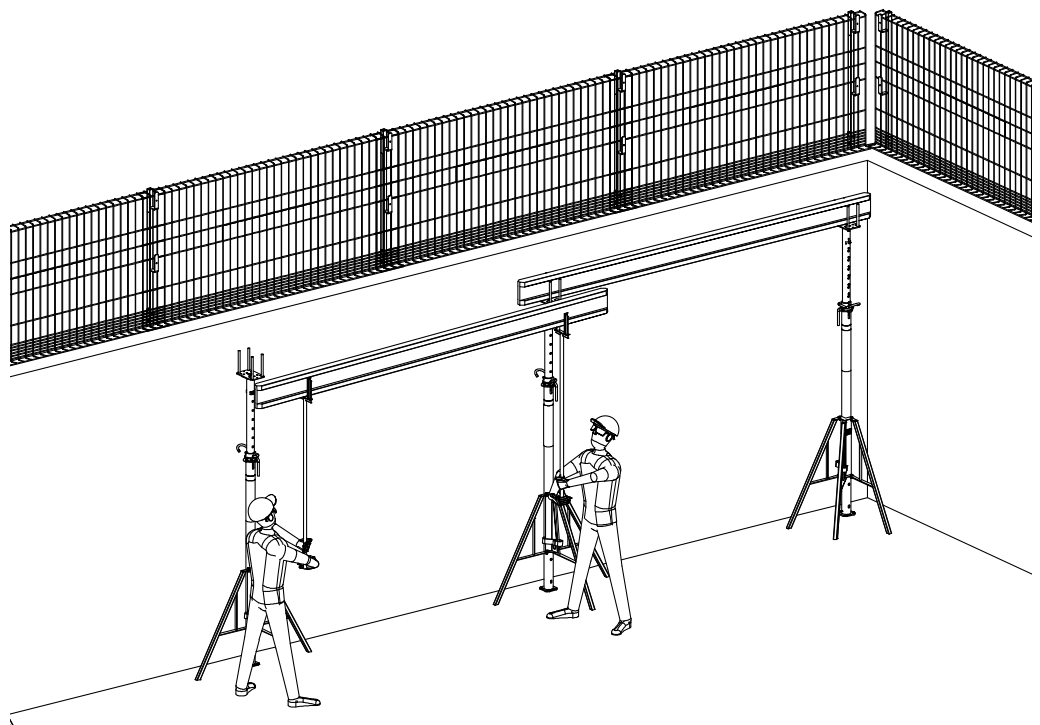
All fall edges, including at the edges of the structure, must be secured by fall protection devices in accordance with the current Ordinance on Industrial Safety and Health (Betriebssicherheitsverordnung).

### 4.2.1 Set up tubular steel props and place primary beams

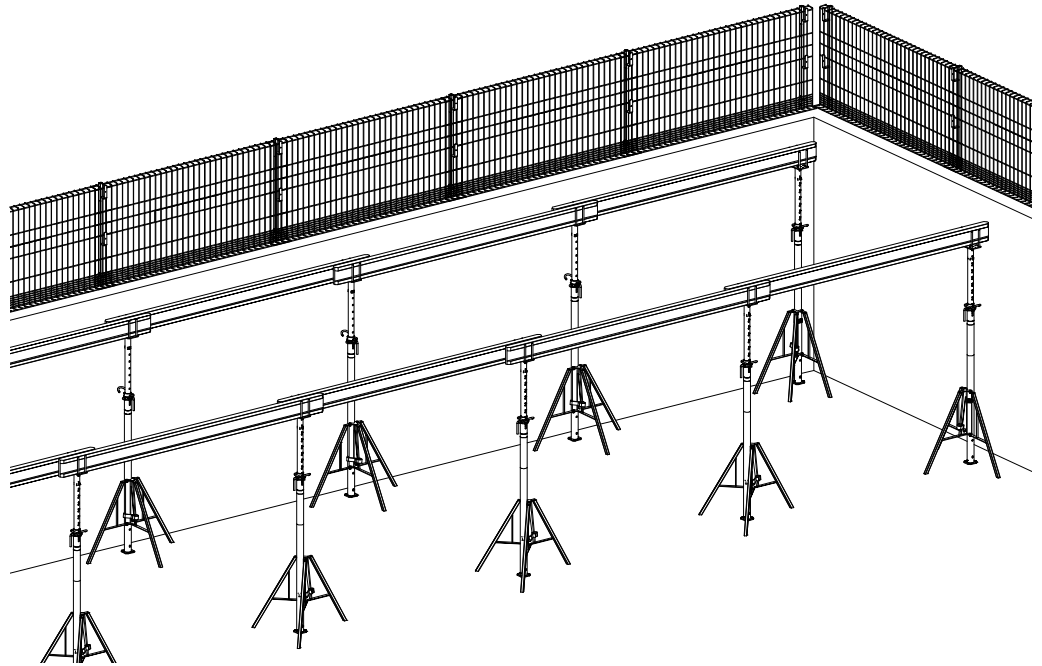
#### TIP

Always extend the tubular steel props a little further than necessary. This will allow you to level out any unevenness in the floor better. It is easier to decrease the height of the steel props under load than to increase.

- Step 1** Set up the first row of tripods along a wall at the intended position.
- Step 2** Place the tubular steel props with fork heads inserted into the tripods and lock the tripods.
- Step 3** Standing on the floor, place the primary beams into the fork heads using the assembly forks.



**Step 4** Set up the second row of tubular steel props with tripods and place primary beams.

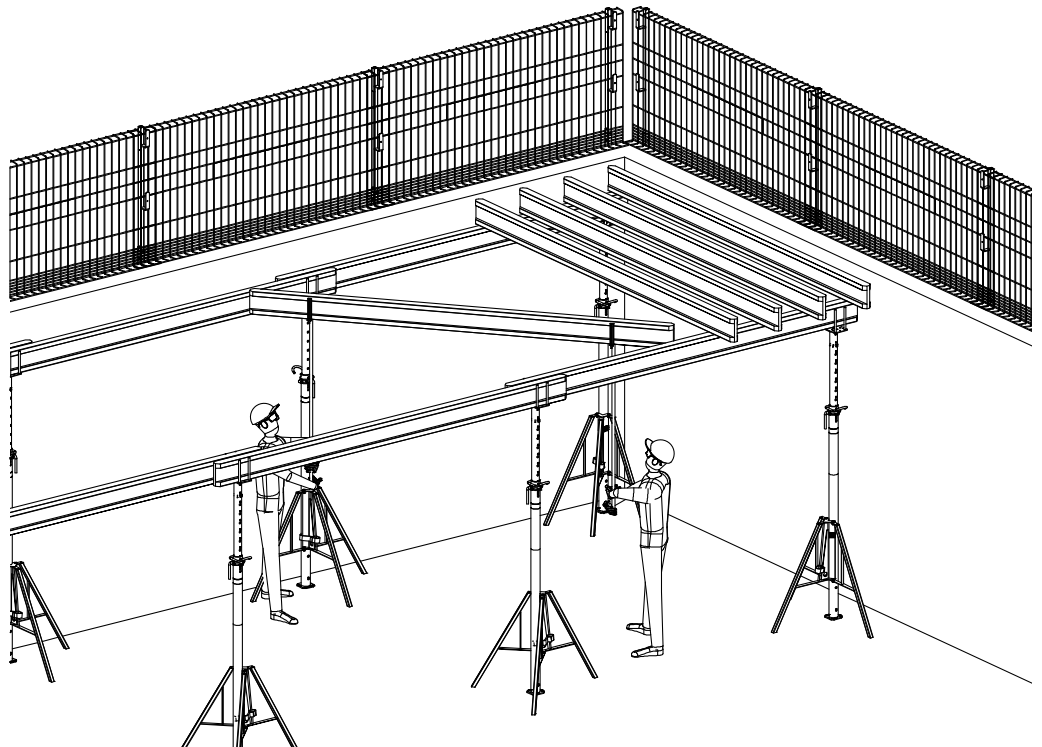


#### 4.2.2 Place secondary beams and shuttering panels

You must first place the required number of secondary beams at the required distance on the primary beams. The required number and spacing can be found in the load tables on page 26 and 27. Make sure that a secondary beam is placed under every joint of shuttering panels. The panels must not protrude more than 40 mm above the secondary beams.

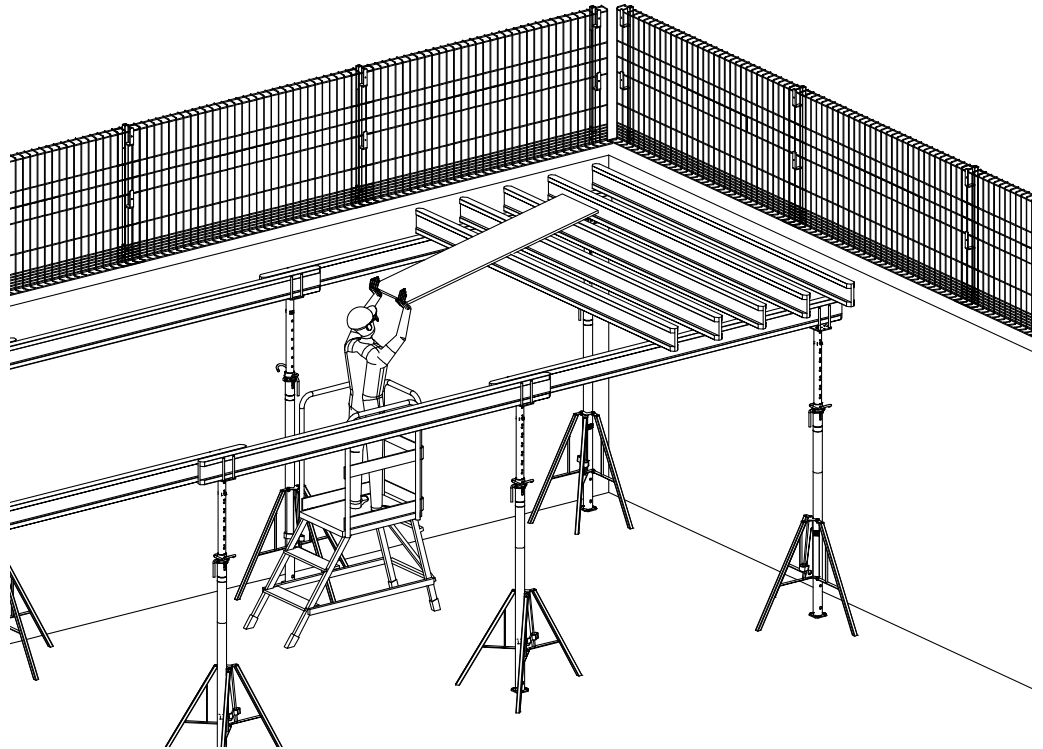
Only place so many secondary beams that you can place a single row of shuttering panels on the beams while standing on the floor or in a secured position.

**Step 1** Standing on the floor, place secondary beams on the primary beams using the assembly fork.



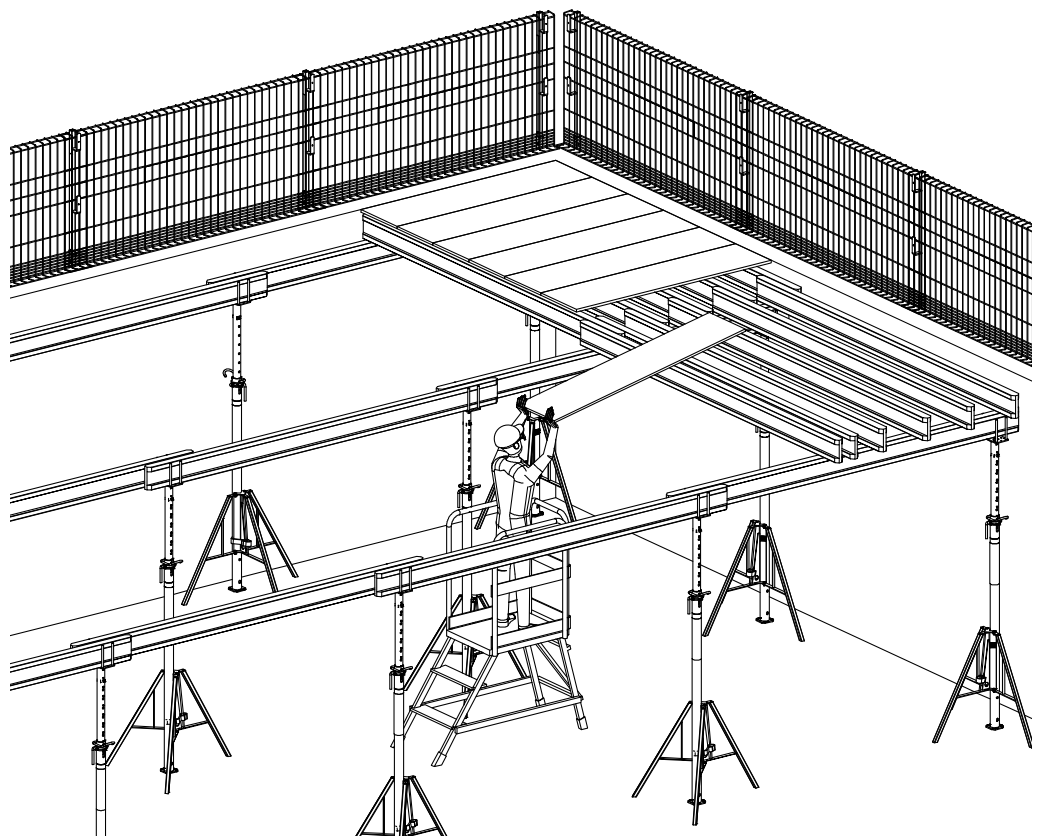


- Step 2** Standing in a safe position, place a row of shuttering panels and secure against uplift, e.g. by nailing to the secondary beams.



- Step 3** Place further tubular steel props, primary beams and secondary beams.

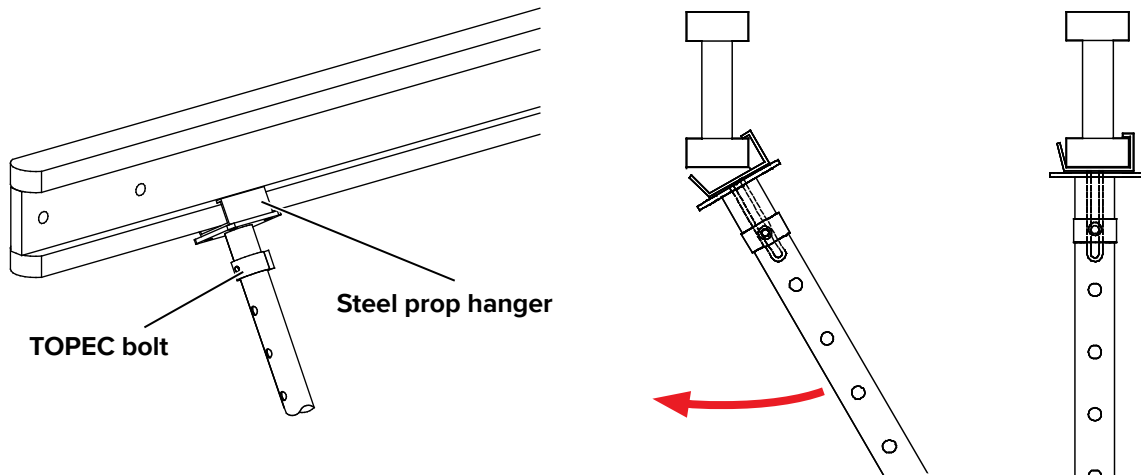
- Step 4** Standing in a safe position, place further shuttering panels on the secondary beams and secure against uplift.



- Step 5** Complete the remaining formwork the same way.

Then the remaining props should be set up under the primary beams, taking into account the static requirements (room height, slab thickness, and maximum permitted loading capacity of the tubular steel props which are being used).

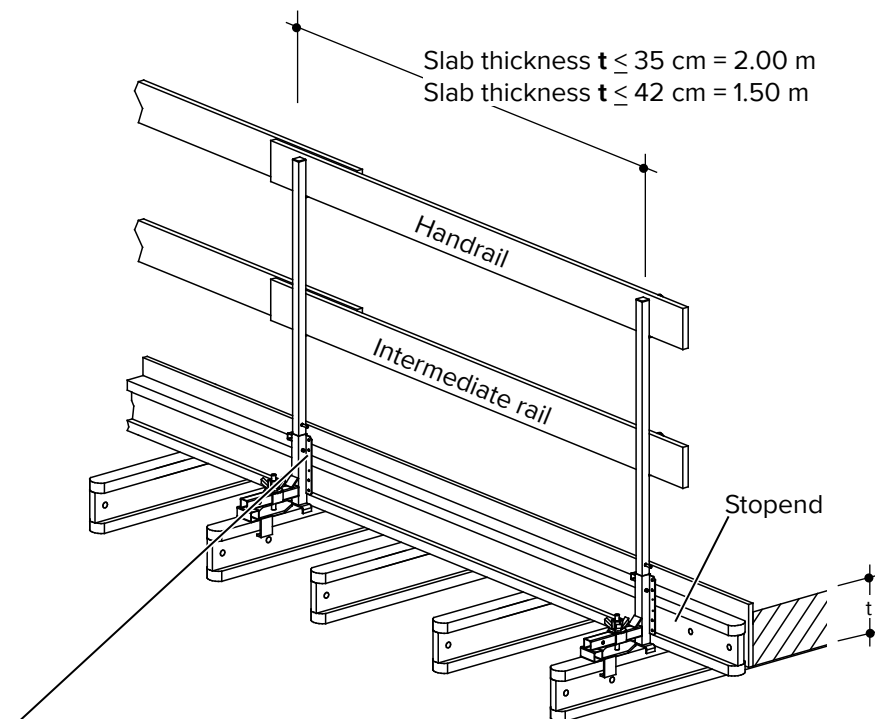
The steel prop hangers which are attached to the props immediately safeguard them from falling over. The prop is then swung into place under the primary beam.



## 4.3 PROTECTO

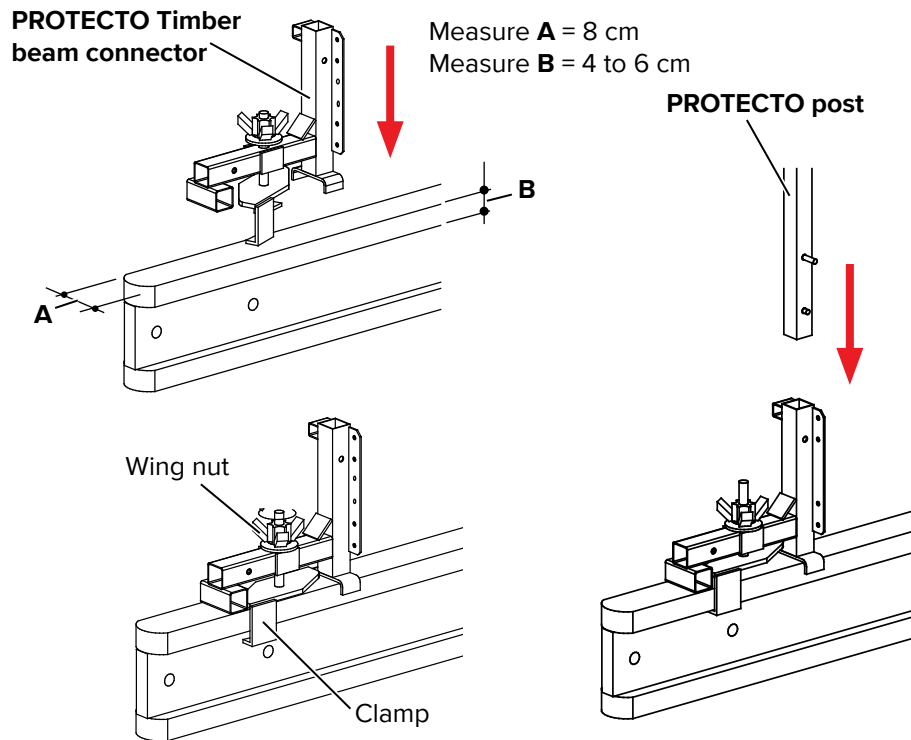
The PROTECTO timber beam connector is a holding device for the railing post specially designed for the connection on usually applied timber beams with heights of 20 cm or 24 cm.

It enables the user to erect the necessary edge protection on cantilevering slab form-work systems and to use it at the same time for supporting the stopend of the slab.



Visual check

Fasten stopend or toe board by means of 2 nails or screws!



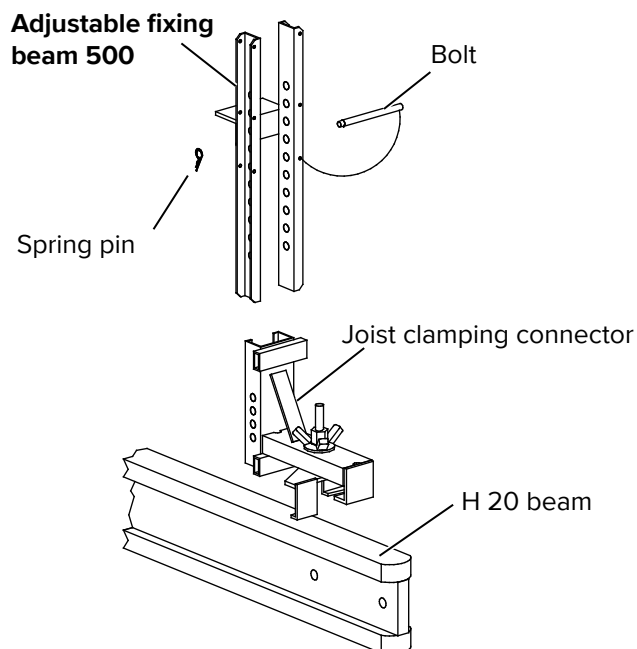
**Visual check**

Pay attention to the correct position of the clamp!

**4.4 Beams**

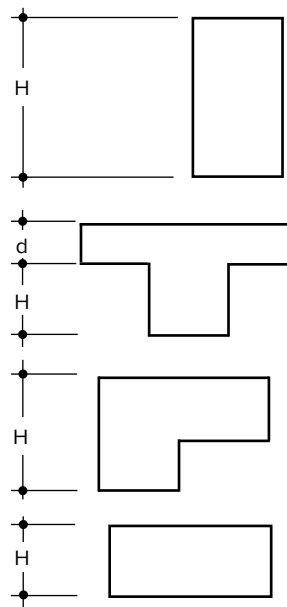
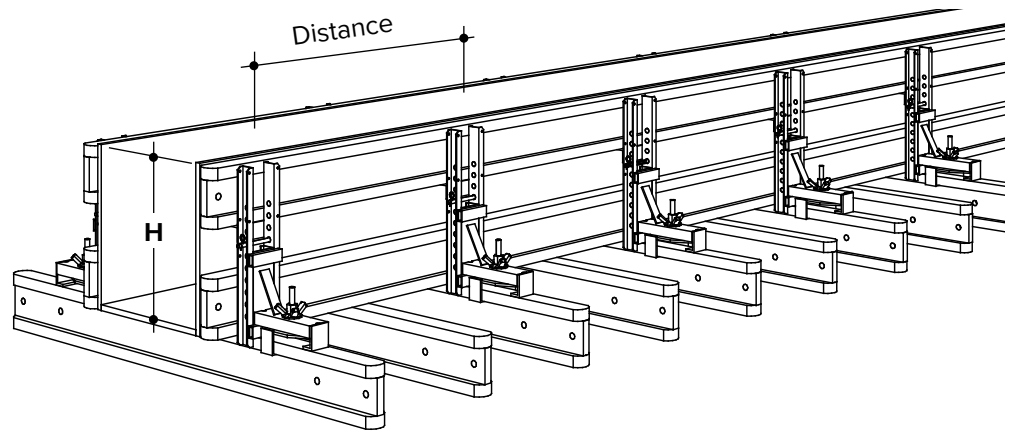
The joist clamping connector is clamped to the upper belt of a timber beam and fastened with the wing nut. The adjustable fixing beam 500 is fastened with the unlosable bolt to the Joist clamping connector in steps of 1 cm corresponding to the required beam height.

The position of the bolt is secured with a spring cotter.



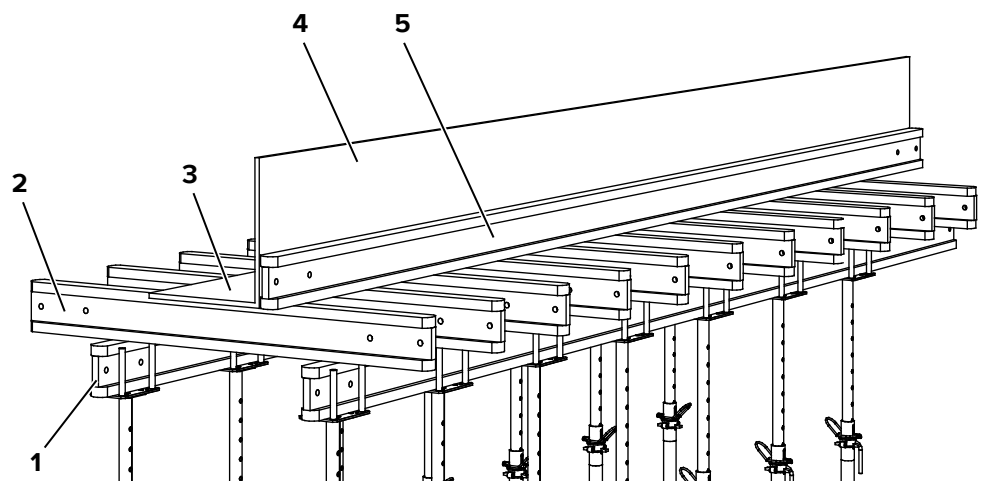
## Permissible distances

The height „H „ of the side formwork is decisive for the calculation. In case of having perimeter beams, the exterior side is decisive for the permissible distances.

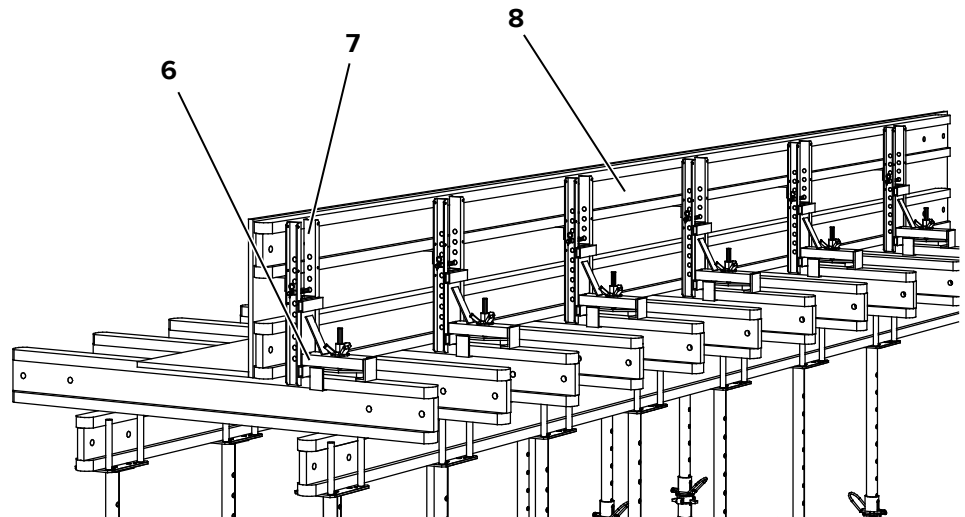


Beam height H [cm]	max. distance of joist clamping connectors		
	Without slab [m]	Slab t = 20 cm [m]	Slab t = 30 cm [m]
30	2.25	1.50	1.25
35	2.00	1.25	1.00
40	1.75	1.05	0.90
45	1.50	0.95	0.80
50	1.35	0.85	0.70
55	1.30	0.75	0.60
60	1.05	0.65	0.50
65	0.90	0.50	0.40
70	0.80	0.40	0.35
75	0.60	0.30	
80	0.55		
85	0.45		
90	0.35		

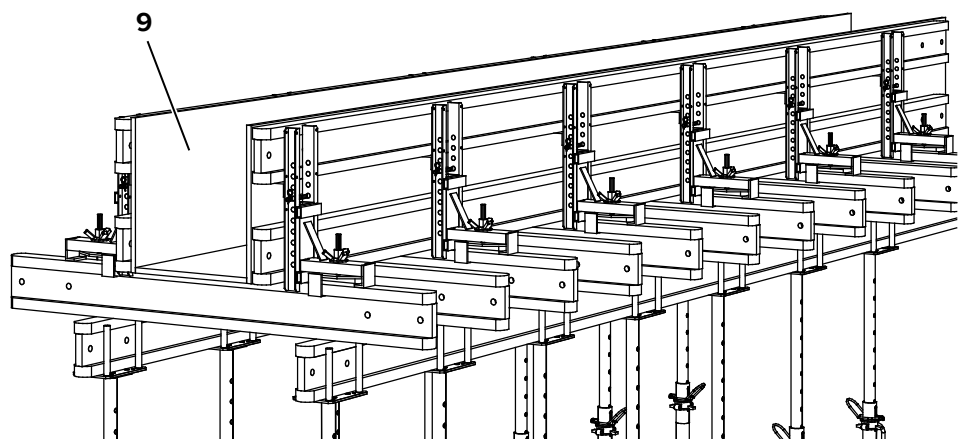
- Step 1** Erect the longitudinal main supports (1).
- Step 2** Place transverse beams (2) on main beams.
- Step 3** Nail bottom shuttering skin (3) onto beams (2).
- Step 4** Place and attach side shuttering skin (4).
- Step 5** Put on timber beam (5) or squared timber.



- Step 6** Position joist clamping connector (6) on top of the cross beam (2), press it against side formwork (4 + 5) and tighten the wing nut by means of a hammer.
- Step 7** Fix the adjustable fixing beam 500 (7) acc. to the desired height of beam formwork.
- Step 8** Place upper timber beam (8) on the angle iron welded to the fixing beam (7).



- Step 9** Erection of opposite side shuttering (9) after reinforcement work. Same procedure as already described before.



## WARNING

### Warning!

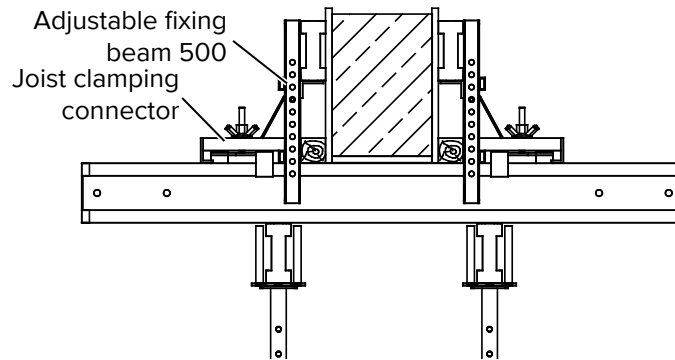
Always arrange the joist clamping connector in opposite position on the same transverse beam!

## 4.5 Joist clamping connector and adjustable fixing beam

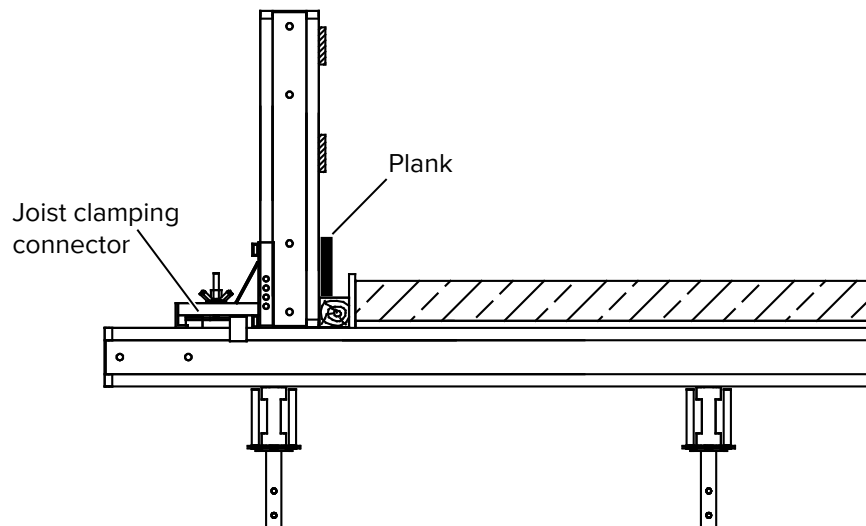
The adjustable fixing beam can be fastened to any timber beam like H 20 and R 24 . Without mounting the fixing beam 500, the 20 cm high timber beam can be directly installed in vertical position in the front profile (reception) of the Joist clamping connector.

### 4.5.1 Examples of application

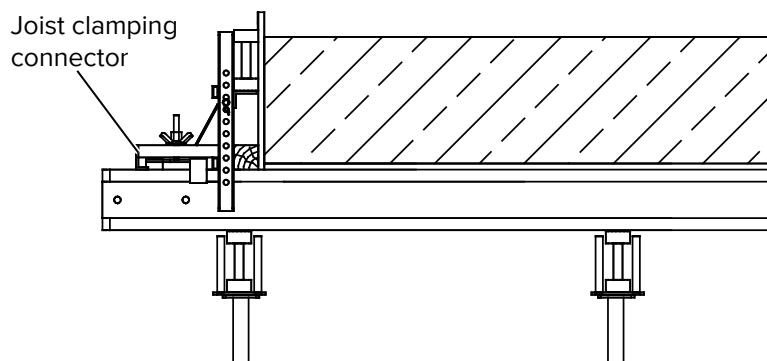
#### Beam



#### Guard rail in conjunction with slab stopend shuttering



#### Slab stopend



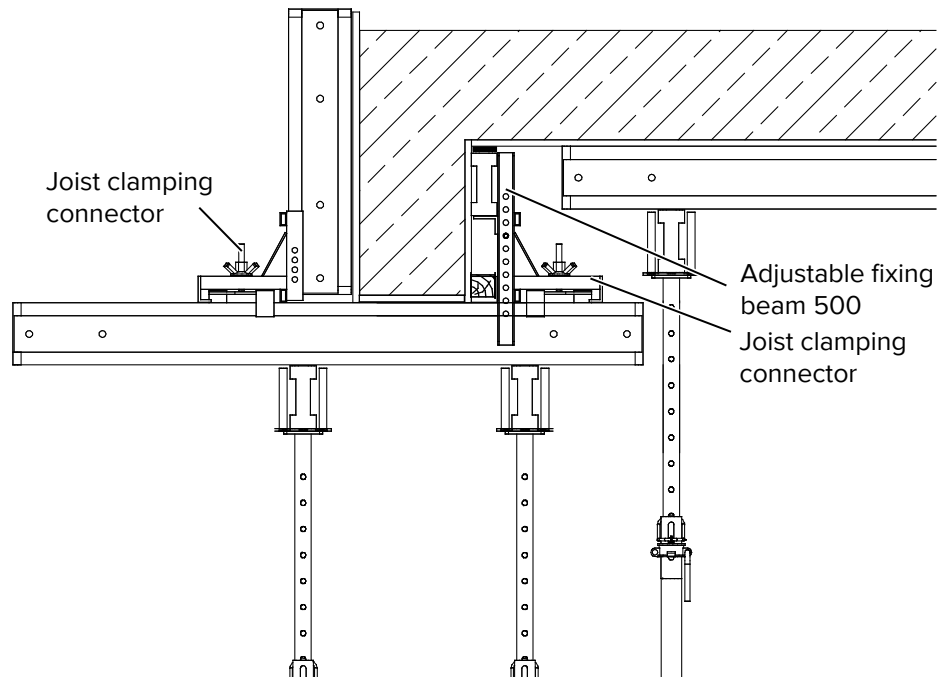
### WARNING

#### Warning!

The slab beam must be secured against horizontal pulling out. For example by nailing to the plywood.

The exterior side shuttering in this example is formed by means of vertically arranged H 20 beams inserted in the C-profile of the joist clamping connector. The application of the Adjustable fixing beam 500 is not required with this design.

**Perimeter beam with slab connection**

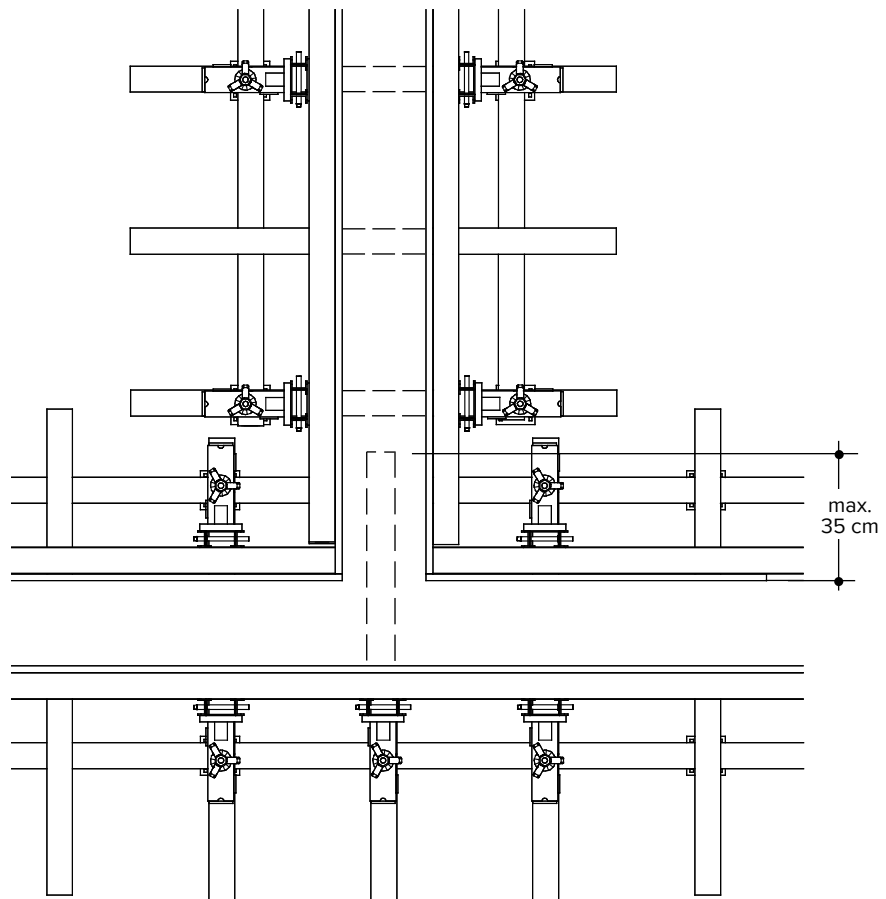


**T-intersections and crossings of beams**

Even in these areas it is possible to work with the joist clamping connector easily and without problems and without costly fitting work.

**Visual check**

The secondary beam must not protrude more than 35 cm into the rectangular arranged beam forwork of the intersection.



## 4.6 Compound use of slab and beam formwork

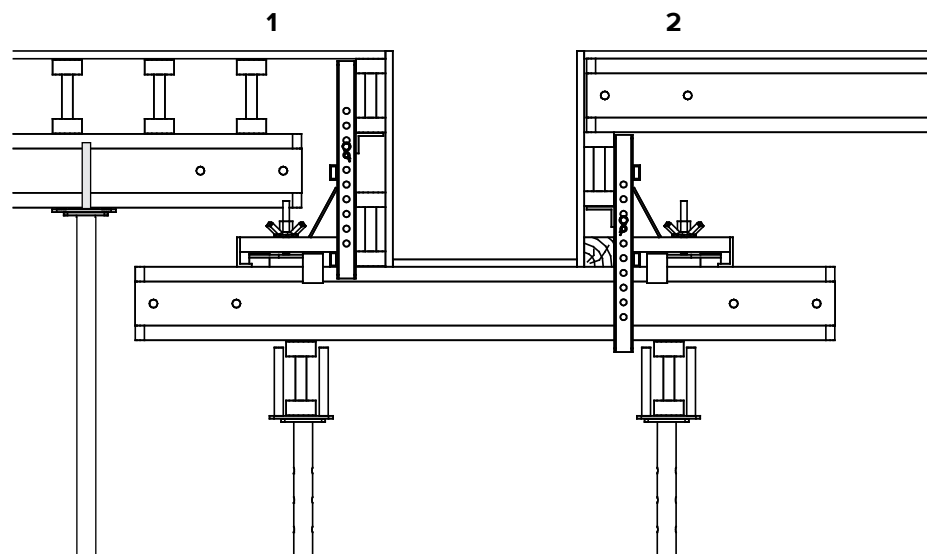
When joining timber beam slab formwork and beam formwork, two connecting variations arise through the directions of the secondary beams of the slab formwork:

### Direction of secondary beam parallel to the beam formwork (1)

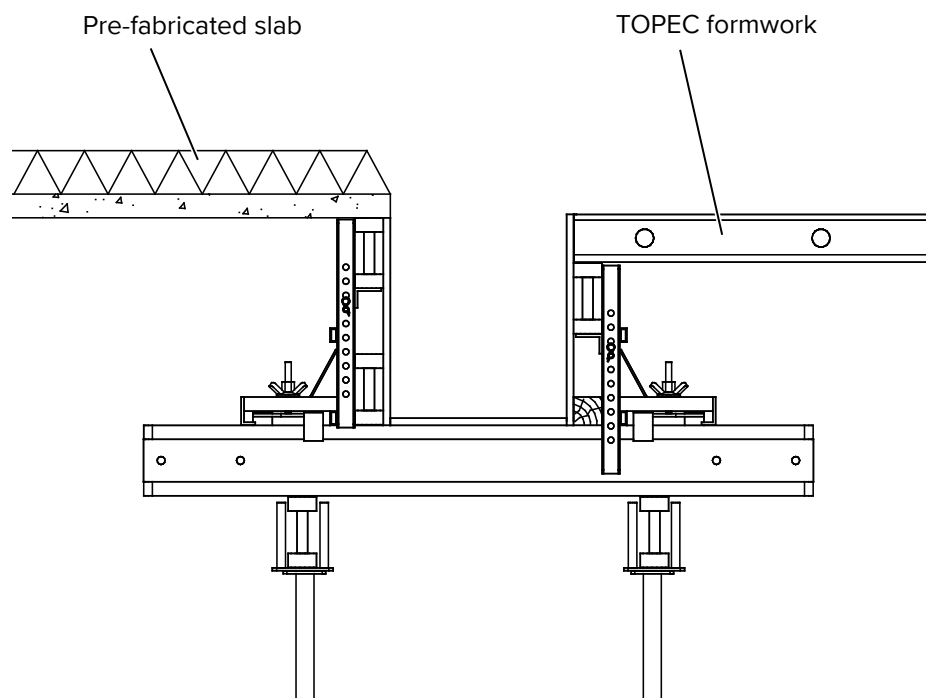
The H 20 timber beam of the side shuttering of the beam is arranged in such a way with the secondary beams of the slab formwork that it serves as support beam for the plywood of the slab at the same time.

### Direction of secondary beam crosswise to the beam formwork (2)

The top H 20 timber beam of the side shuttering of the beam is lowered to such a degree that the secondary beam can directly be placed on this.



Other slab formwork systems can be bound into the beam formwork without any problems thanks to the height adjustment possibility of the adjustable fixing beam.



**WARNING**

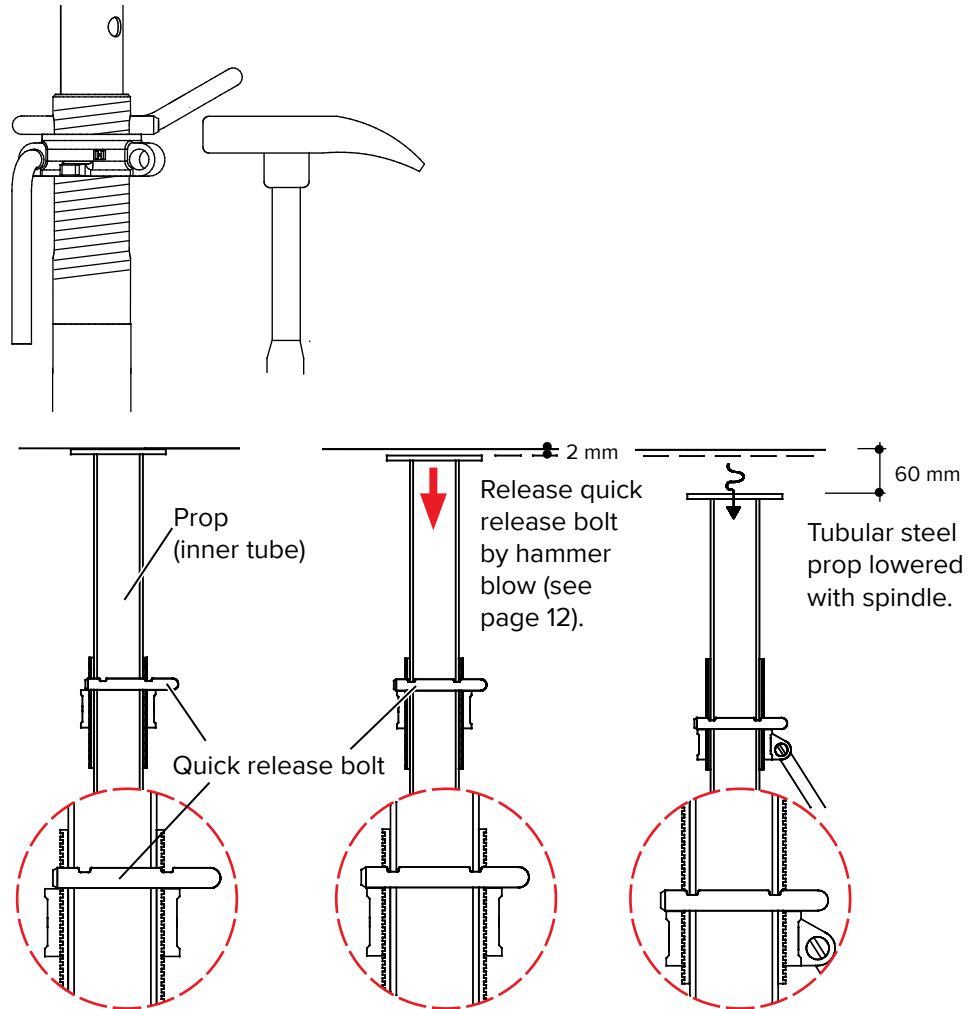
**Warning!**

Max. load per joist clamping connector: 6.5 kN!



## 5 Stripping

Stripping begins with lowering the props. For all tubular steel props from HÜNNEBECK, the quick lowering mechanism immediately reduces the pressure on the thread nut. A blow of the hammer suffices and then the slab shuttering can easily be lowered by about 6 cm turning down the adjustment nut.



The Assembly fork is an effective tool for taking down the beams (see section *Assembly* on page 13). Remove the Tripod galv. from the props, and sort and stack all of the shuttering materials.

## 6 Tables for shuttering panels

### 6.1 TOPFLEX calculation

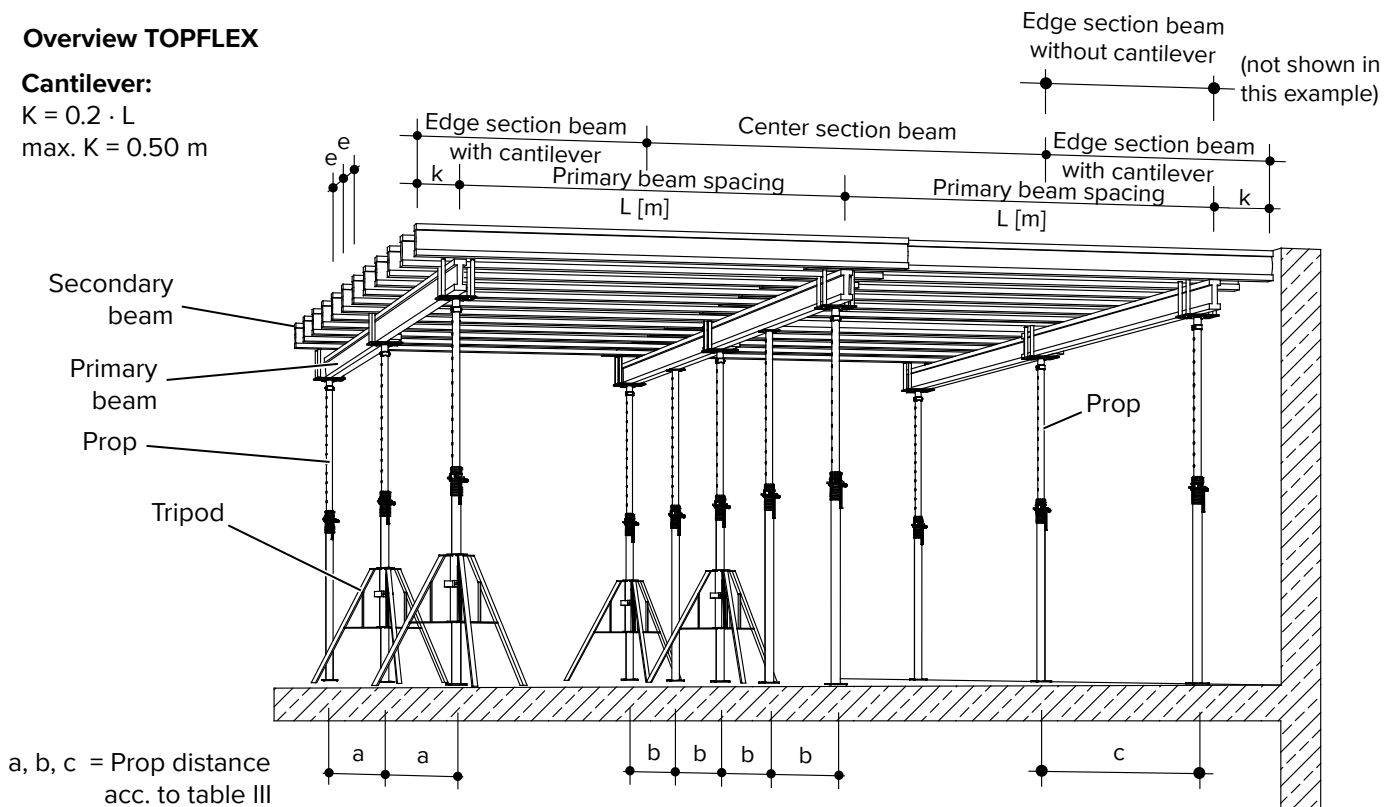
The existing slab thickness and the selected secondary beam spacing, which depends upon the type and size of the selected shuttering panel, determine the maximum permitted distance between primary beams. Using the selected primary beam spacing and slab thickness, the maximum permitted distance between props for the primary beam axes can then be determined. All the figures necessary for the efficient use of TOPFLEX slab formwork can be quickly and precisely determined with the help of the following tables.

#### Overview TOPFLEX

##### Cantilever:

$$K = 0.2 \cdot L$$

$$\text{max. } K = 0.50 \text{ m}$$



#### Support spacing for shuttering panels

Table I

Panel size	Possible secondary beam spacing e	
150/50	e = 75 cm	e = 50 cm
200/50	e = 66.7 cm	e = 50 cm
250/50	e = 62.5 cm	e = 50 cm

Table II

Secondary beam spacing [cm]	Max. slab thickness [cm] 3 S panel
75.0	24
66.7	34
62.5	42
50.0	82

Deflection is limited to  $f < L/500$ .



**WARNING**

#### Warning!

All figures are only valid for the supporting systems as stated!

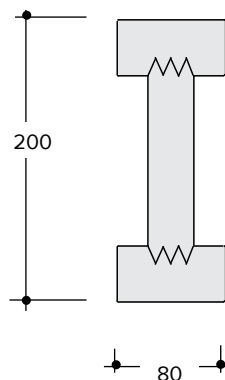
## 7 Load table H 20

### Handling:

- Select slab thickness according to specifications (1)
- Determine secondary beam spacing (2)
- Taking into account size and thickness of shuttering panel (see page 26). (1)
- Determine max. span of secondary beam (2)
- Determine final distance between primary beams (2)
- Determine prop spacing for axes of primary beams (Edge section and centre section). (3)

### Requirements:

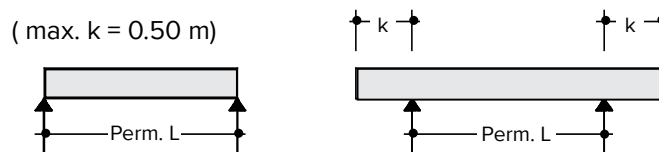
Use according to DIN EN 12812 2004-09. Class B1



Permitted bending moment	$M_{perm} = 5.00 \text{ kNm}$
Permitted shearing force	$Q_{perm} = 11.00 \text{ kN}$
Stiffness	$E \times I = 500 \text{ kNm}^2$

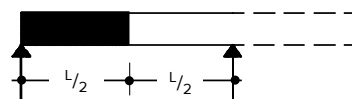
Max. permitted span for secondary beams L in „m“ = Max. primary beam spacing.

### 7.1 Systems

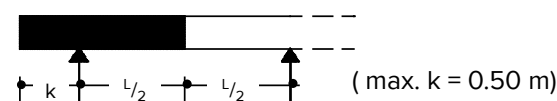


#### Loading width for:

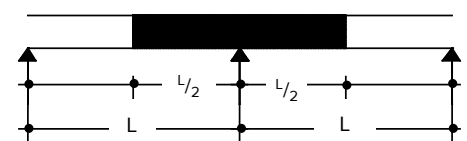
a) Edge section beam without cantilever



b) or edge section beam with cantilever in „m“



c) or centre section beam



## 7.2 Table III

### 7.2.1 Dimensioning of slab formwork beams

①			②					③											
Slab thickness [cm]	Loads out of formwork and concrete [kN/m <sup>2</sup> ]	Total load *) [kN/m <sup>2</sup> ]	Distance of secondary beam e [m] (considering page 26)					Chosen spacing between primary beams or load distance L[m]											
			0.40	0.50	0.63	0.67	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	3.00	3.50	4.00	4.50	
			Permissible span of secondary beams = max. spacing of primary beams L <sub>perm.</sub> [m]					Permissible prop spacing under primary beams [m] (a. b or c acc. to page 26)											
10	2.75	4.25	4.12	3.82	3.55	3.47	3.34	3.07	2.74	2.50	2.32	2.17	2.05	1.94	1.73	1.48	1.29	1.15	
12	3.25	4.75	3.90	3.62	3.36	3.29	3.16	2.90	2.60	2.37	2.19	2.05	1.93	1.84	1.54	1.32	1.16	1.03	
14	3.75	5.25	3.72	3.45	3.20	3.13	3.01	2.76	2.47	2.25	2.09	1.95	1.84	1.68	1.40	1.20	1.05	0.93	
16	4.25	5.75	3.56	3.31	3.07	3.00	2.89	2.64	2.36	2.15	1.99	1.87	1.70	1.53	1.28	1.09	0.96	0.85	
18	4.75	6.25	3.43	3.19	2.96	2.90	2.78	2.53	2.26	2.07	1.91	1.76	1.56	1.41	1.17	1.01	0.88	0.78	
20	5.25	6.75	3.32	3.08	2.86	2.80	2.69	2.43	2.18	1.99	1.84	1.63	1.45	1.30	1.09	0.93	0.81	0.72	
22	5.75	7.25	3.22	2.99	2.78	2.72	2.61	2.35	2.10	1.92	1.73	1.52	1.35	1.21	1.01	0.87	0.76	0.67	
24	6.25	7.75	3.13	2.91	2.70	2.64	2.54	2.27	2.03	1.85	1.62	1.42	1.26	1.14	0.95	0.81	0.71	0.63	
26	6.75	8.25	3.05	2.84	2.63	2.58	2.48	2.20	1.97	1.78	1.52	1.33	1.19	1.07	0.89	0.76	0.67	0.59	
28	7.25	8.75	2.99	2.77	2.57	2.51	2.42	2.14	1.91	1.68	1.44	1.26	1.12	1.01	0.84	0.72	0.63	0.56	
30	7.75	9.25	2.92	2.71	2.51	2.46	2.37	2.08	1.86	1.59	1.36	1.19	1.06	0.95	0.79	0.68	0.59	0.53	
35	9.00	10.63	2.77	2.58	2.39	2.34	2.24	1.94	1.66	1.38	1.18	1.04	0.92	0.83	0.69	0.59	0.52	0.46	
40	10.25	12.00	2.66	2.47	2.29	2.24	2.11	1.83	1.47	1.22	1.05	0.92	0.81	0.73	0.61	0.52	0.46	0.41	
45	11.50	13.38	2.58	2.37	2.19	2.12	2.00	1.64	1.32	1.10	0.94	0.82	0.73	0.66	0.55	0.47	0.41	0.37	
50	12.75	14.75	2.47	2.29	2.08	2.02	1.90	1.49	1.19	0.99	0.85	0.75	0.66	0.60	0.50	0.43	0.37	0.33	

The black marked cells refer to the shuttering example in chapter 8 on page 30.

\*) As total load is, as determined according to DIN EN 12812:

$$\text{total load} = g + b + p1 + p2$$

$$\text{Formwork: } g = 0.25 \text{ kN/m}^2$$

$$\text{Concrete load: } b = 25.0 \cdot d \text{ [kN/m}^2\text{]}$$

$$\text{Working load: } p1 = 0.75 \text{ kN/m}^2$$

$$\text{Additional load with in-situ concrete } p2 = 0.1 \cdot \text{concrete load [kN/m}^2\text{]} \text{ whereas: } 0.75 < p2 < 1.75 \text{ [kN/m}^2\text{]}$$

The deflection for formwork and concrete load (g + b) calculated and limited to  $f < L/500$ .

### 7.2.2 Prop loads

The prop load F results from the total load  $g + b + p1 + p2$ , multiplied with the influence area (chosen beam spacing • chosen prop spacing). If the permitted prop load  $F_{perm.}$  is smaller than F, the prop spacing must be lowered by the factor  $F_{perm.} / F$ . (see also example on lower page 29).



### WARNING

#### Warning!

The maximum perm. prop load in relation to the extension length can be found in the HÜNNEBECK loading Table with allowable loads for tubular steel props (previous props)! EUROPLUS new props allow 20 kN or 30 kN! Furthermore, the requirements of the DIN 12812, Class B1, have to be adhered to!

### NOTE

#### Note!

This table is only to be used as dimensioning aid. It does not replace a stability verification!

## 8 Shuttering example

(Also refer to load tables page 26 et seq.)

(Assumption: Classification class B1 acc. to DIN EN 12812: 2004-09)

### I.) To be used for shuttering example:

Clear floor-to-floor height	$h = 2.60 \text{ m}$
Slab thickness	$d = 16 \text{ cm}$
Selected beam	H 20
Secondary beam spacing	$e = 0.75 \text{ m}$
Shuttering skin (thickness)	$= 21 \text{ mm}$
Area load	$q = 5.75 \text{ kN/m}$ (Table III, part 1)

### II.) Determining the max. perm. span for secondary beams

In Part 2 of Table III on page 28, find where the 16 cm slab thickness row intersects with the 0.75 cm secondary beam spacing column, to obtain the maximum permitted span of 2.89 m (= max. primary beam spacing with  $f < L/500$ ).

### III.) Determining the max. perm. span for primary beams

In Part 3 of Table III, the first horizontal column shows the desired primary beam spacings and thus also the loading widths. For example, for a room width of 3.50 m, primary beams RJ1 and RJ2 (see ground-plan) have a loading width of 1.75 m. By seeing where the 1.75 m column intersects with the 16 cm slab thickness row, you obtain the max. prop spacing of 1.99 m for the edge section beam. For the centre section beam MJ, taking into account the loading span of 2.50 m, the max. permitted prop spacing is calculated at 1.53 m (= max. prop spacing).

### IV.) Selected Tubular steel prop

The permissible loading figures of the HÜNNEBECK steel props can be found in the former load tables (former EUROPLUS props).

Prop extension length: clear room height - (2 x 20 cm beam height + 21 mm plywood)

# Shuttering example

## Example

clear room height 2.60 m - 42 cm = 2.18 m Prop extension length

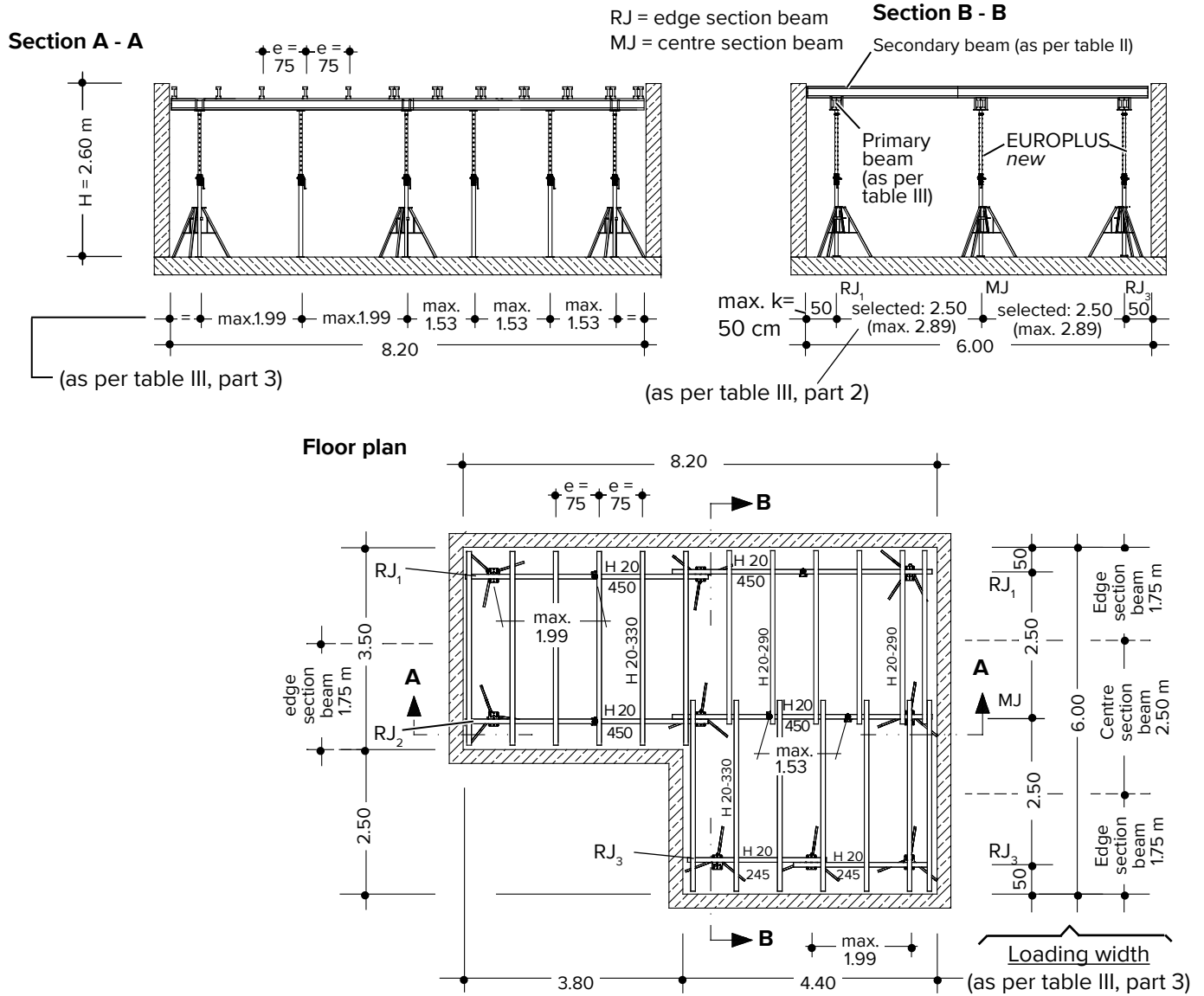
Permissible load of the EUROPLUS 260DB/DW props at 2.60m extension length: 21.49 kN

2.60 m - 42 cm = 2.18 m Extension length

Existing prop load

RJ (edge section beam):  $F = 5.75 \cdot 1.75 \cdot 1.99 = 20 \text{ kN} < 21.49 \text{ kN}$

MJ (centre section beam):  $F = 5.75 \cdot 2.50 \cdot 1.57 = 21.99 \text{ kN}$



**Materials summary (example)**

No.	Component	Part code
2	H 20 - 245	581770
6	H 20 - 290	581792
13	H 20 - 330	581807
4	H 20 - 450	581830
14	EUROPLUS new	601390
9	Fork head 8/20	417565
5	Steel prop hanger.	510749
9	Tripod	587377
<b>Suggested</b>		
14	TOPEC bolt	470804
2	Assembly fork	510554
2	Euro stacking frame	553689
2	Euro Trolley	607610

## 9 Load tables for props

The load tables in this section are only valid for system-bound arrangement. The prerequisites stated in DIN EN 12812, section 9 must be fulfilled before using the load tables with TOPFLEX.

These are for example:

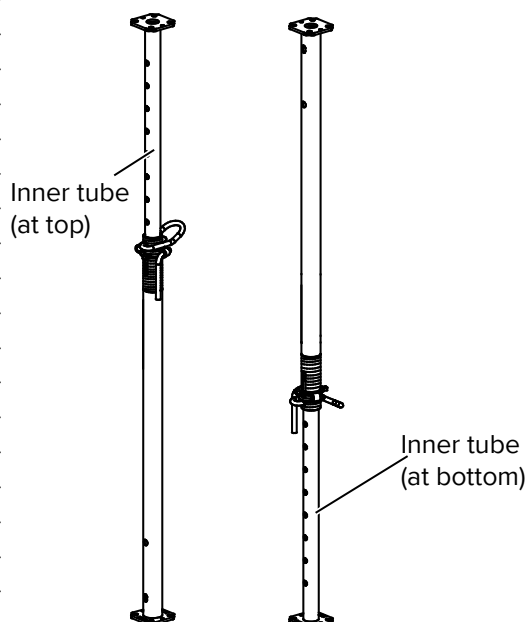
- The user guide must be available at the construction site.
- The documents relevant for stability (here type examination with data sheet) must be available at the place of use.
- Overview drawings, which clearly define the construction in ground plans and sections and represent essential details, shall be part of the documentation.
- Information on the load assumptions made and on the properties of the subsoil shall also be part of the documentation.
- Formwork plans must be drawn up with position details of the secondary beams, primary beams and props as well as the type of props.
- A static calculation must be made for the individual case, which implies the proof of the props.
- The designated props must not be mixed with other types of props during use.



## HÜNNEBECK EUROPLUS<sup>new</sup>

Permissible prop loads [kN] for use in system-bound arrangement

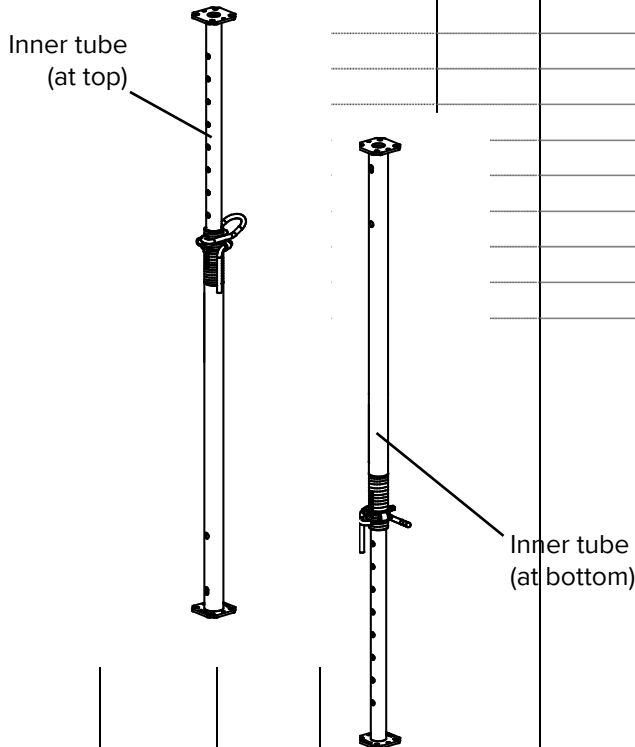
Designation L <sub>min.</sub> - L <sub>max.</sub> Position of Inner Tube (IT) L [m]	20-250 1.47m-2.50m		20-300 1.72m-3.00m		20-350 1.98m-3.50m		20-400 2.24m-4.00m		20-550 3.04m-5.50m	
	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>
1.10										
1.20										
1.30										
1.40										
<b>1.50</b>	27.76	27.76								
1.60	27.76	27.76								
1.70	26.54	27.76								
1.80	25.02	27.76	38.48	38.48						
1.90	24.02	27.76	38.48	38.48						
<b>2.00</b>	23.12	27.76	35.09	38.48	27.76	27.76				
2.10	22.72	27.76	32.52	38.48	27.76	27.76				
2.20	22.32	27.76	30.91	38.48	27.76	27.76				
2.30	21.80	27.76	29.30	38.48	27.76	27.76	30.97	30.97		
2.40	21.21	26.52	28.01	38.48	27.76	27.76	30.97	30.97		
<b>2.50</b>	20.61	24.73	27.21	38.48	27.76	27.76	30.97	30.97		
2.60			26.40	35.55	27.76	27.76	30.97	30.97		
2.70			25.44	32.42	27.76	27.76	30.97	30.97		
2.80			23.83	29.69	27.76	27.76	30.97	30.97		
2.90			22.22	26.95	27.76	27.76	30.97	30.97		
<b>3.00</b>			20.61	24.21	27.76	27.76	30.97	30.97		
3.10					27.76	27.76	30.97	30.97	38.48	38.48
3.20					27.76	27.76	30.97	30.97	38.48	38.48
3.30					27.19	27.76	30.37	30.97	38.48	38.48
3.40					25.70	27.76	29.19	30.97	38.48	38.48
<b>3.50</b>					24.21	27.76	28.02	30.97	38.48	38.48
3.60							26.75	30.97	38.48	38.48
3.70							25.35	30.97	38.48	38.48
3.80							23.94	28.95	38.48	38.48
3.90							22.53	26.84	38.48	38.48
<b>4.00</b>							21.12	24.73	38.48	38.48
4.10									38.48	38.48
4.20									38.29	38.48
4.30									36.58	38.48
4.40									34.99	38.48
<b>4.50</b>									33.40	38.48
4.60									31.82	38.48
4.70									30.23	36.71
4.80									28.64	34.12
4.90									27.13	31.71
<b>5.00</b>									26.04	30.29
5.10									24.95	28.87
5.20									23.87	27.45
5.30									22.78	26.03
5.40									21.69	24.60
<b>5.50</b>									20.61	23.18



## HÜNNEBECK EUROPLUS<sup>new</sup>

Permissible prop loads [kN] for use in system-bound arrangement

Designation L <sub>min.</sub> -L <sub>max.</sub> Position of Inner Tube (IT) L [m]	30-150 1.04m-1.50m		30-250 1.47m-2.50m		30-300 1.72m-3.00m		30-350 1.98m-3.50m		30-400 2.24m-4.00m	
	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>	IT <sub>at top</sub>	IT <sub>bottom</sub>
1.10	36.06	38.48								
1.20	35.63	38.48								
1.30	35.03	38.48								
1.40	35.03	38.48								
<b>1.50</b>	35.03	38.48	33.33	33.33						
1.60			33.33	33.33						
1.70			33.33	33.33						
1.80			33.33	33.33	37.21	37.21				
1.90			33.33	33.33	37.21	37.21				
<b>2.00</b>			33.33	33.33	37.21	37.21	49.45	49.45		
2.10			33.33	33.33	37.21	37.21	49.45	49.45		
2.20			33.22	33.33	37.21	37.21	49.45	49.45		
2.30			32.74	33.33	37.21	37.21	49.45	49.45	38.48	38.48
2.40			32.34	33.33	36.83	37.21	48.91	49.45	38.48	38.48
<b>2.50</b>			31.94	33.33	36.19	37.21	47.56	49.45	38.48	38.48
2.60					35.55	37.21	46.20	49.45	38.48	38.48
2.70					34.77	37.21	44.85	49.45	38.48	38.48
2.80					33.48	37.21	43.57	48.56	38.48	38.48
2.90					32.20	37.21	42.35	47.07	38.48	38.48
<b>3.00</b>					30.91	36.58	41.13	45.58	38.48	38.48
3.10							39.91	44.09	38.48	38.48
3.20							37.82	41.73	38.48	38.48
3.30							35.52	39.15	38.48	38.48
3.40							33.21	36.58	38.48	38.48
<b>3.50</b>							30.91	34.00	38.48	38.48
3.60									38.48	38.48
3.70									38.48	38.48
3.80									38.48	38.48
3.90									37.94	38.48
<b>4.00</b>									36.06	38.48
4.10										
4.20										
4.30										
4.40										
<b>4.50</b>										
4.60										
4.70										
4.80										
4.90										
<b>5.00</b>										
5.10										
5.20										
5.30										
5.40										
<b>5.50</b>										



## 10 Storage and transport

### 10.1 Euro stacking frame

The shuttering materials are stored and transported in the practical euro stacking frames. The euro stacking frame is designed for a working load of 1 200 kg. It can be moved with a crane, a fork lift or with the Euro Trolley.



#### **WARNING**

#### **Warning!**

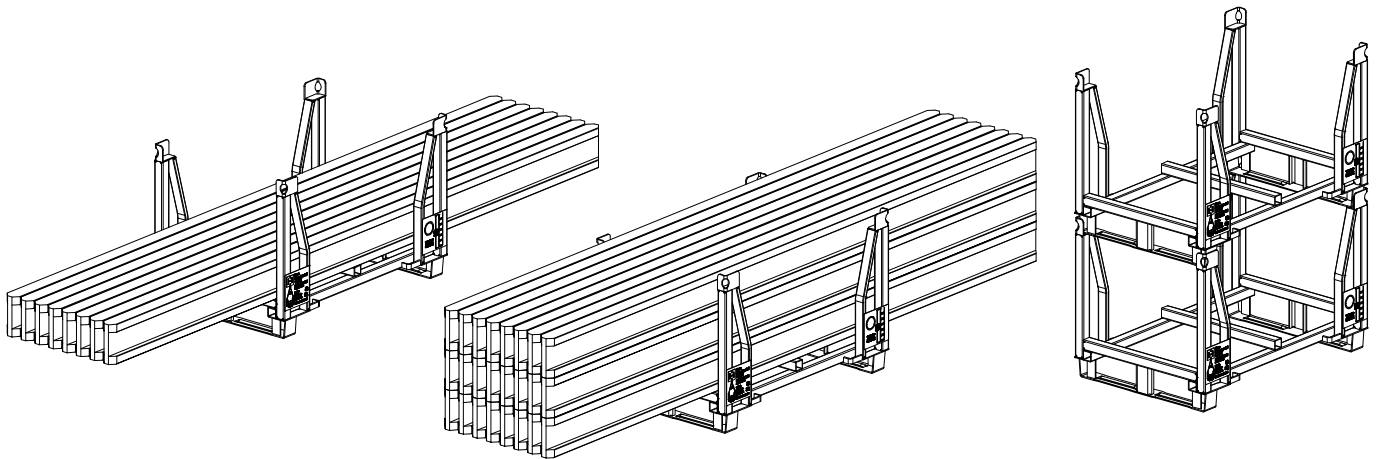
Up to 6 loaded stacking frames can be stacked on the floor.  
A single stacking frame can be transported using the Euro Trolley.



#### **WARNING**

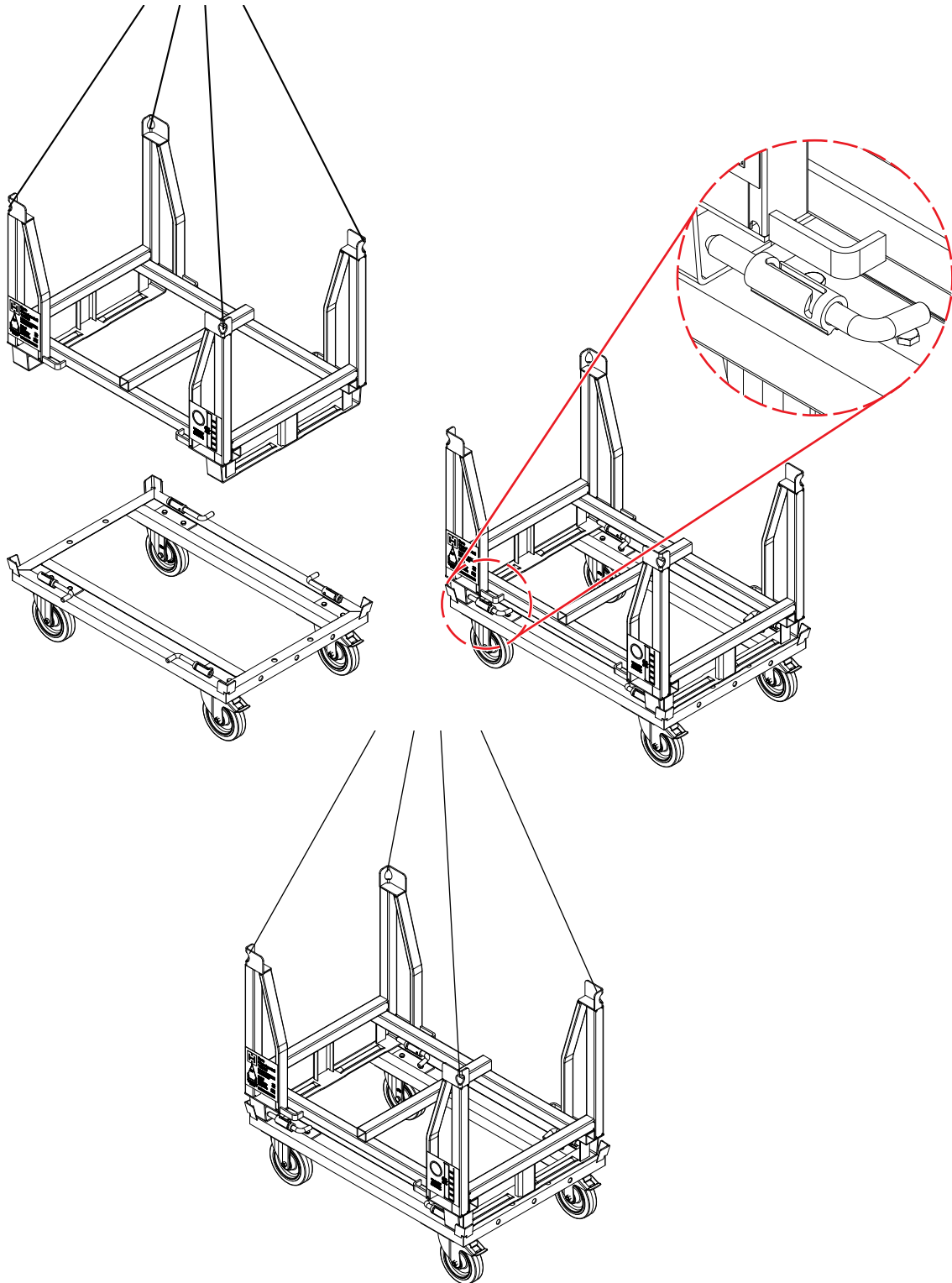
#### **Warning!**

Refer to the information sign of the euro stacking frame!

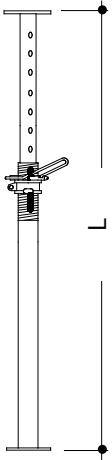
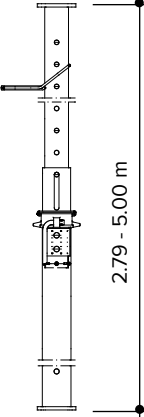


## 10.2 Euro Trolley

The Euro Trolley is used to transport single stacking frames or lattice boxes. Euro Trolley and stacking frame/lattice box can be moved by crane. For this the stacking frame/lattice box must be secured with all 4 locking bolts of the Euro Trolley.



## 11 Hitherto props

	Component	Part code	Weight [kg]
	<b>EUROPLUS props</b>		
	<b>EUROPLUS 260 DB/DIN</b> L = 1.54 - 2.60 m	<b>463021</b>	<b>15.88</b>
	<b>EUROPLUS 300 DB/DIN</b> L = 1.72 - 3.00 m	<b>555118</b>	<b>17.53</b>
	<b>EUROPLUS 350 DB/DIN</b> L = 1.98 - 3.50 m	<b>552147</b>	<b>21.34</b>
	<b>EUROPLUS 400 EC</b> L = 2.24 - 4.00 m	<b>583780</b>	<b>27.11</b>
	<b>EUROPLUS 550 DC</b> L = 3.03 - 5.50 m	<b>583725</b>	<b>38.00</b>
<p>All steel props are provided with a quick-lowering mechanism, anti-crush guard and a protection against dropping-out of the inner tube and are also protected for a long service-life by hot-dip galvanization.</p>			
	<b>Aluminium props</b>	<b>558898</b>	<b>24.80</b>
	Alu 500 DC L = 2.79 - 5.00 m Prop class C50/D50		

## Permitted load [kN]

DIN EN 1065 and DIN EN 12812 Class B1

Class B: Perm. load depending on extension length maximum 30 kN.

Class C: Perm. load depending on extension length maximum 30 kN.

Class D: 20 kN perm. load at any extension length.

Class E: 30 kN perm. load at any extension length.

The load tables in this section are only valid for sytem-bound arrangement. The prerequisites stated in DIN EN 12812, section 9 must be fulfilled before using the load tables with TOPFLEX (refer also to page 32).

	260 DB/DIN	300 DB/DIN	350 DB/DIN	410 DB/DIN	450 DB/DIN
Size	1	2	3	4	5
Extension length [m]	1.54 - 2.60 m	1.72 - 3.00 m	1.98 - 3.50 m	2.34 - 4.10 m	2.50 - 4.50 m
1.50	30.00				
1.60	30.00				
1.70	30.00	30.00			
1.80	30.00	30.00			
1.90	28.81	30.00			
2.00	26.00	30.00	30.00		
2.10	23.58	27.21	30.00		
2.20	21.49	24.79	28.93		
2.30	20.00	22.68	26.47	30.00	
2.40	20.00	20.83	24.31	28.47	
2.50	20.00	20.00	22.40	26.24	28.80
2.60	20.00	20.00	20.71	24.26	26.63
2.70		20.00	20.00	22.50	24.69
2.80		20.00	20.00	20.92	22.96
2.90		20.00	20.00	20.00	21.40
3.00		20.00	20.00	20.00	20.00
3.10			20.00	20.00	20.00
3.20			20.00	20.00	20.00
3.30			20.00	20.00	20.00
3.40			20.00	20.00	20.00
3.50			20.0	20.00	20.00
3.60				20.00	20.00
3.70				20.00	20.00
3.80				20.00	20.00
3.90				20.00	20.00
4.00				20.00	20.00
4.10				20.00	20.00
4.20					20.00
4.30					20.00
4.40					20.00
4.50					20.00

	550 DC
Size	7
Extension length [m]	3.03 - 5.50 m
3.00	35.00
3.10	34.34
3.20	32.23
3.30	30.30
3.40	28.55
3.50	26.94
3.60	25.46
3.70	24.11
3.80	22.85
3.90	21.70
4.00	20.63
4.10	20.00
4.20	20.00
4.30	20.00
4.40	20.00
4.50	20.00
4.60	20.00
4.70	20.00
4.80	20.00
4.90	20.00
5.00	20.00
5.10	20.00
5.20	20.00
5.30	20.00
5.40	20.00
5.50	20.00

	350 EC/DIN	350 EC/DIN
Size	3	4
Extension length [m]	1.98 - 3.50 m	2.24 - 4.00 m
2.00	35.00	
2.10	35.00	
2.20	35.00	35.00
2.30	35.00	35.00
2.40	35.00	35.00
2.50	33.60	35.00
2.60	31.07	35.00
2.70	30.00	32.92
2.80	30.00	30.61
2.90	30.00	30.00
3.00	30.00	30.00
3.10	30.00	30.00
3.20	30.00	30.00
3.30	30.00	30.00
3.40	30.00	30.00
3.50	30.00	30.00
3.60		30.00
3.70		30.00
3.80		30.00
3.90		30.00
4.00		30.00

## 12 Chronology

Changes since edition 2010-03		
Changes	Seite	Datum
Layout updated	div	2019-03
H 20 beams replaced by H 20 K beams, approval replaced by standard	7	2019-03
Section 4 updated	13	2019-03
Section shuttering procedures removed		2019-03
Mobile set removed	div	2019-03
Euro Trolley added	12, 35	2019-03
Illustrations TOPEC bolts updated	10	2019-03

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**Last updated: March 2019**  
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