THE FORMWORK

NOE® H20 Deck

Dated: 01.2021

Assembly and Operating Manual

Assembly and Operating Manual
NOE H20 Deck formwork

Contents

1 Safety advice, GSV guidelines

1.1 Advice on proper and safe use 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 assembly and use instructions.

- Risk assessment: The contractor is responsible for the compilation, documentation, implementation and revision of a risk assessment for each construction site. His 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 assembly instructions form part of the basis for the compilation of a set of installation instructions.
- Assembly and use instructions: Formwork is technical work equipment and is intended for commercial use only. It must be used properly and exclusively through trained specialist personnel and appropriately qualified supervising personnel. The assembly and use instructions are an integral component of the formwork construction. They comprise at least safety guidelines, details on the standard configuration and proper use, as well as the system description. The functional instructions (standard configuration) contained in the assembly instructions are to be complied with exactly 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 others on site.
- Availability of the assembly and use instructions: The contractor must ensure that the assembly and use instructions provided by the manufacturer or formwork supplier are available at the place of use, that site personnel are informed of this before assembly and use takes place, and that they are available at all times.
- Representations: The representations (drawings, diagrams etc.) shown in the assembly instructions are, in part, situations of assembly and not always complete in terms of safety considerations. Any safety installations that may not have been shown in these representations must nevertheless be available.
- Storage and transportation: Any special requirements relating to transportation procedures and storage of the formwork constructions must be complied with. An example would be the use of the appropriate lifting gear.
- 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 at authorised repair facilities only.
- Use of other products: Combining formwork components from different manufacturers carries certain risks. They are to be individually verified and can result in the compilation of a separate set of assembly instructions required for the installation of the equipment.

- Use of other products: Individual safety symbols are to be complied with. Examples:

Safety information: Non-compliance can lead to damage to materials or risk to the health of site personnel (also life).

Visual check: The intended operation is to be subject to a visual check.

Note: Supplementary information for safe, correct and professional execution of work activities.

- Miscellaneous: We reserve the right to make amendments in the course of technical development. All current country-specific laws, standards and other safety regulations are to be complied with without exception for the safe application and use of the products. They form a part of the obligations of employers and employees regarding industrial safety. This gives rise to, 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, which also includes the basic assembly, dismantling and the transport of the formwork and falsework constructions or their components. The complete construction is to be checked during and after assembly.

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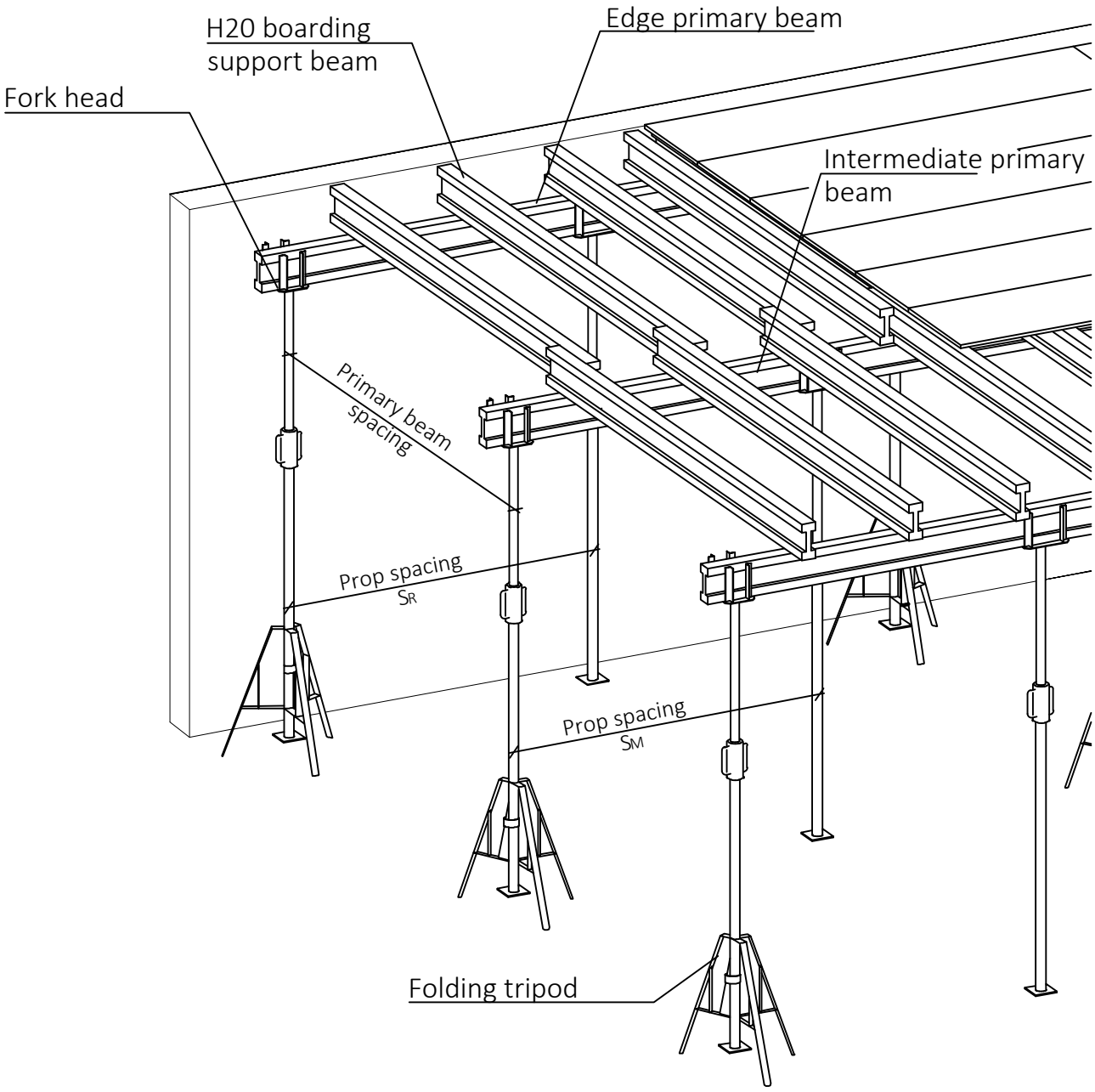
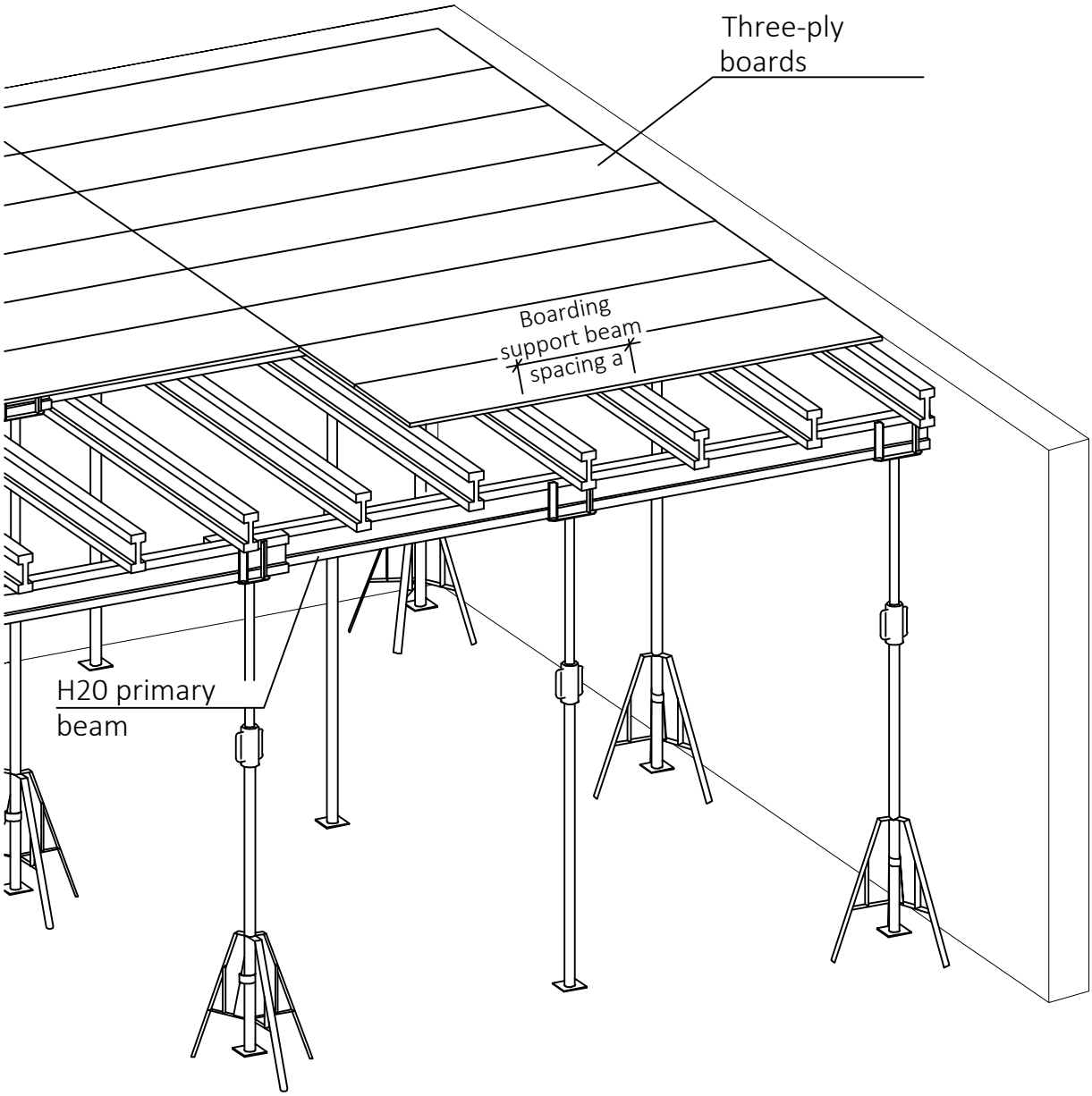
2 NOE H20 - deck formwork

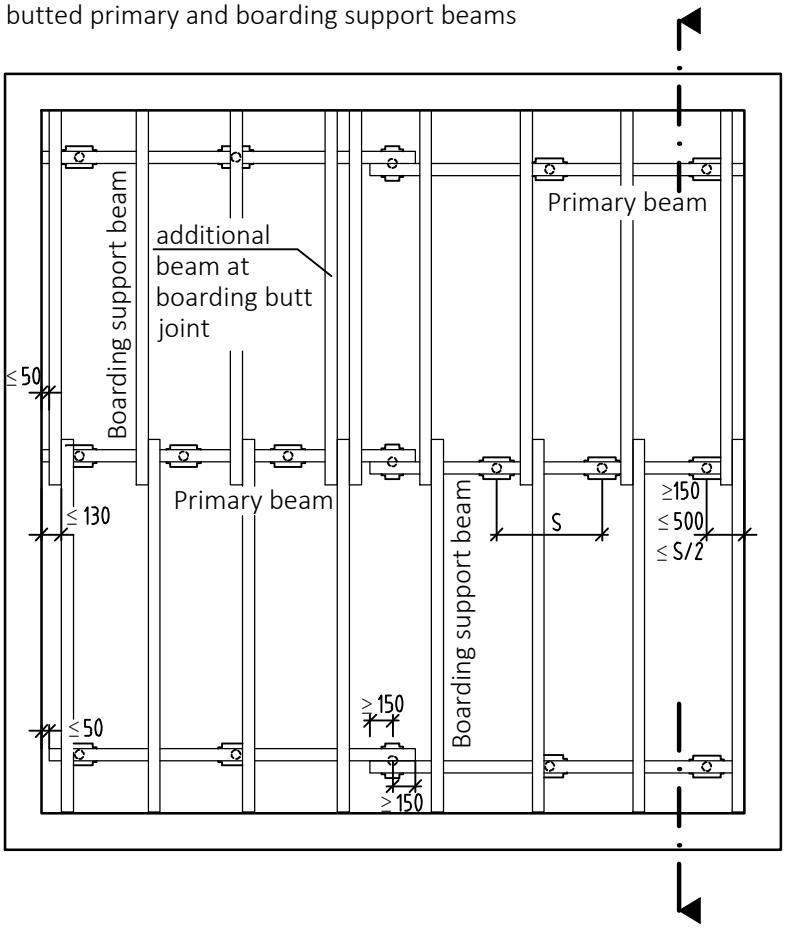


Horizontal forces are to be transferred to the main structure.

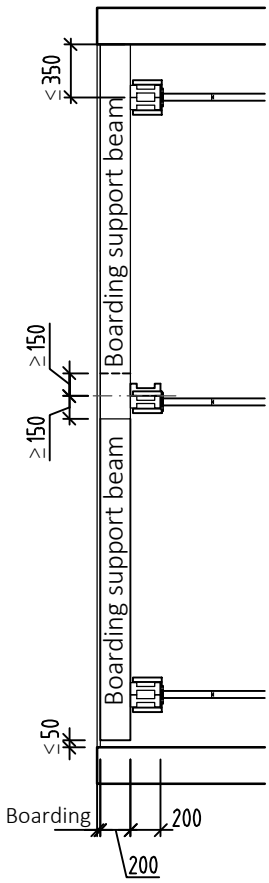

Three-ply boards
Boarding support beam spacing a
H20 primary beam

3 Edge distances

Plan view
with butted primary and boarding support beams

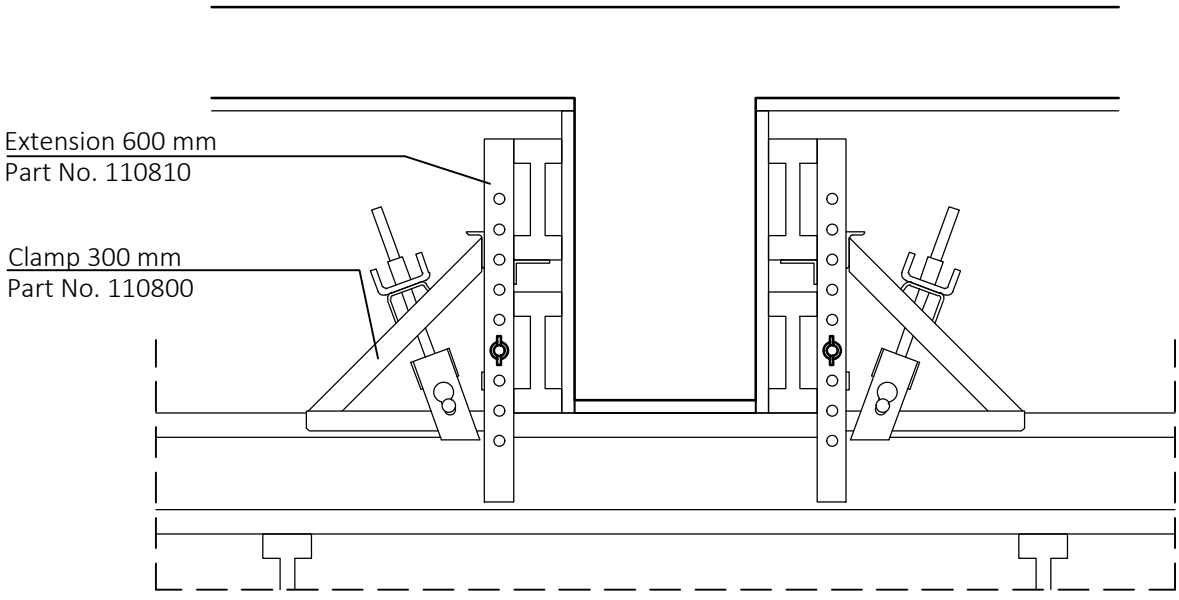


Section



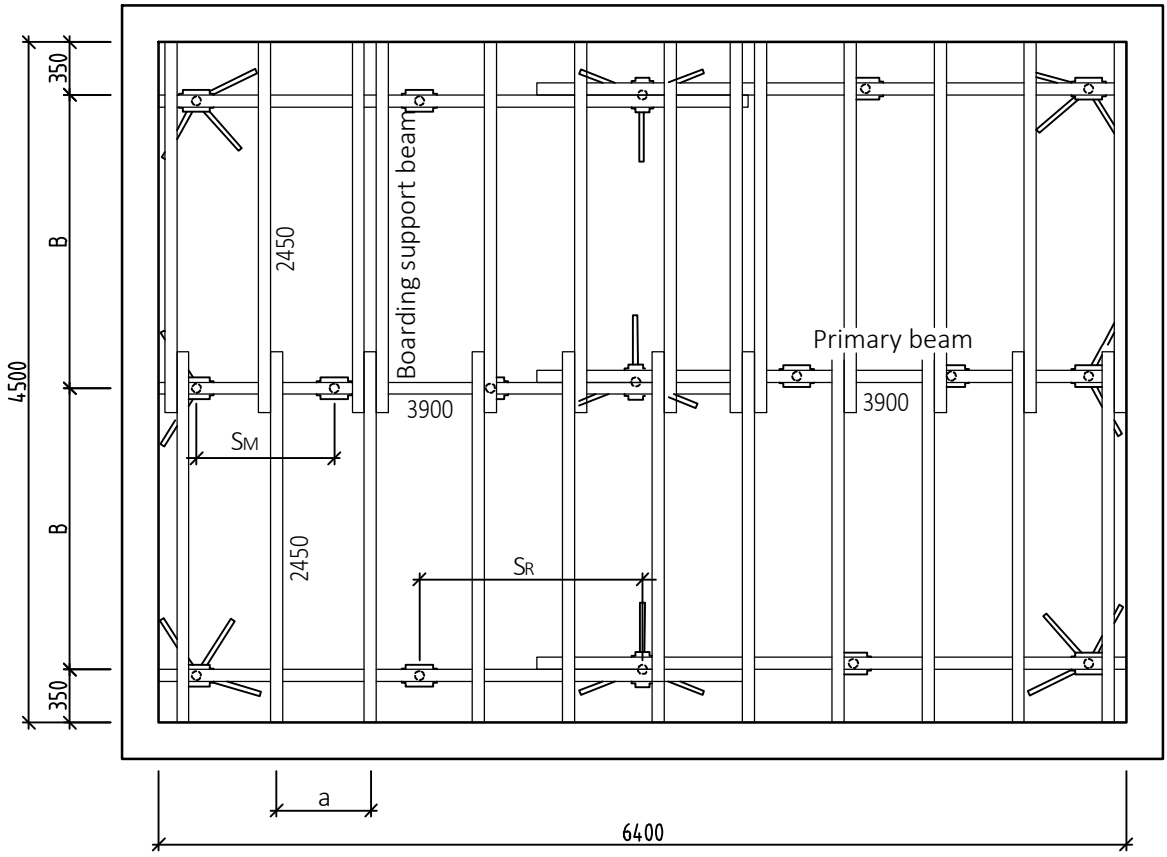
4 Beams

Downstand height up to 700 mm with beam clamp and extension
Deck thickness d_0 max. 300 mm



5 Example

Deck area 6400 x 4500 mm

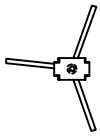


a Boarding support beam spacing

B Primary beam spacing

SM Prop spacing intermediate primary beam

SR Prop spacing edge primary beam



Folding tripod with fork head on each primary beam ending and primary beam butt joint

6 Design

Calculation sizes

Permissible loads as per DIN EN 12812

Formwork Weight : $g = 0.35$ kN/m^2
Live Loads : $v = 0.75$ kN/m^2 (Load Cl. 1)
Concrete Load : $b = 25 \times d$ kN/m^2
Fill Weight Concrete : $p = 0.1 \times b$ kN/m^2
$0.75 \leq p \leq 1.75$ kN/m^2
Load : $q = g + v + b + p$

The design is based to EN 12812 according the design class A, B1 or B2. The design class A only is allowed to be used, if the deck thickness does not exceed d=30 cm and the headroom is smaller than 3,50 m.
The Information in tables take into account the design class.

① Boarding support beam spacing a

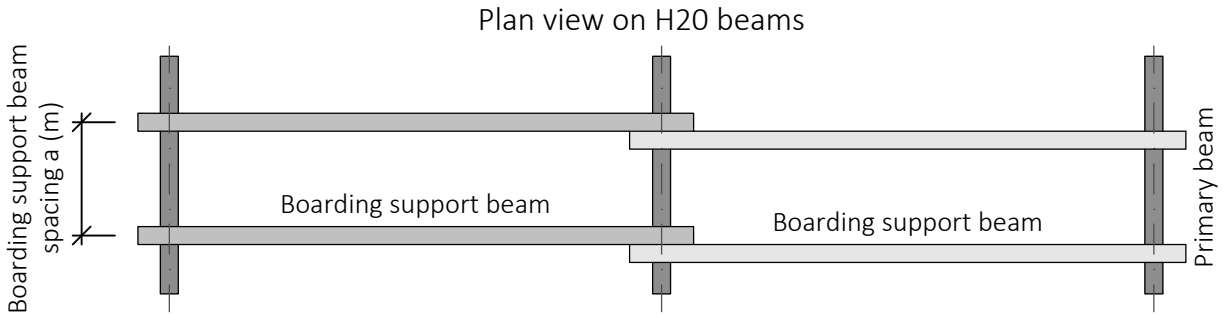


Table 1: Boarding support beam spacing

When used with 21 mm three-ply panels, support transverse to fibre direction.

Boarding support beam spacing a (m)	0,50	0,63
Max. deck thickness d (m)	0,50	0,32

Max. deflection of the panels: a/500 for loads in accordance with DIN EN 12812

For the distance of the boarding support beams, the deflection of the panels is decisive. The distinction according to the design class is not applicable.

② *Max. primary beam spacing B (in m)*

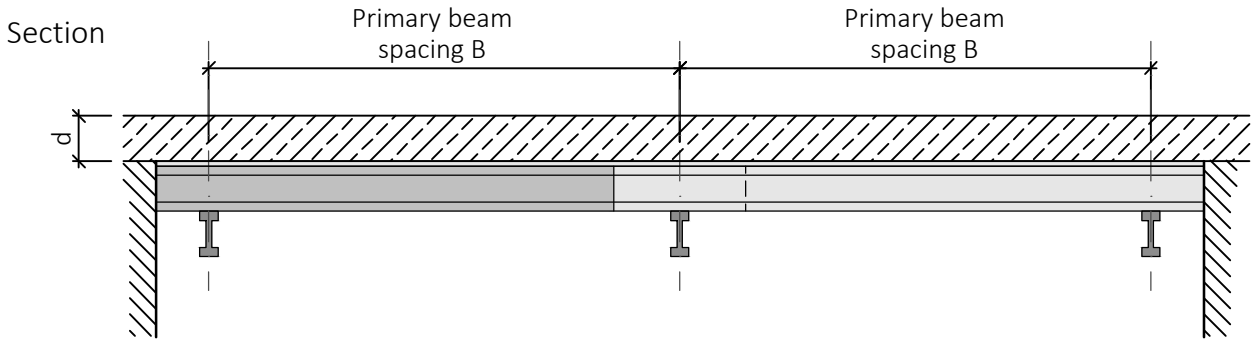


Table 2: Primary beam spacing

For the primary beam spacing B (max. 3,50 m) up to deck thickness d=0,30 m, the deflection of the boarding support beam is decisive. The distinction according to the design class is not applicable.

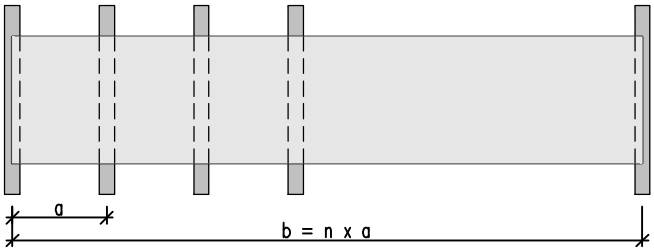
Deck thickness (m)		0,10	0,12	0,14	0,16	0,18	0,20	0,22	0,24	0,26	0,28	0,30	0,35	0,40	0,45	0,50
Boarding support beam spacing a (m)	0,28	3,50	3,50	3,50	3,50	3,50	3,46	3,38	3,31	3,24	3,18	3,12	2,98	2,87	2,76	2,68
	0,31	3,50	3,50	3,50	3,50	3,41	3,33	3,25	3,18	3,12	3,06	3,00	2,87	2,75	2,66	2,57
	0,36	3,50	3,50	3,45	3,35	3,26	3,18	3,11	3,04	2,98	2,92	2,87	2,74	2,63	2,54	2,46
	0,42	3,50	3,39	3,28	3,18	3,10	3,02	2,95	2,89	2,83	2,78	2,73	2,61	2,50	2,41	2,34
	0,50	3,30	3,19	3,09	3,00	2,92	2,84	2,78	2,72	2,66	2,61	2,57	2,45	2,36	2,27	2,16
	0,63	3,07	2,96	2,87	2,78	2,71	2,64	2,58	2,52	2,47	2,43	2,38	(2,27)	(2,14)	(2,03)	(1,93)
	0,75	2,89	2,78	(2,70)	(2,62)	(2,55)	(2,48)	(2,43)	(2,37)	(2,33)	(2,28)	(2,22)	(2,07)	(1,95)	(1,85)	(1,71)

Max. deflection of the boarding support beam: B/500 for loads in accordance with DIN EN 12812. Values in brackets not for 21 mm three-ply panels.

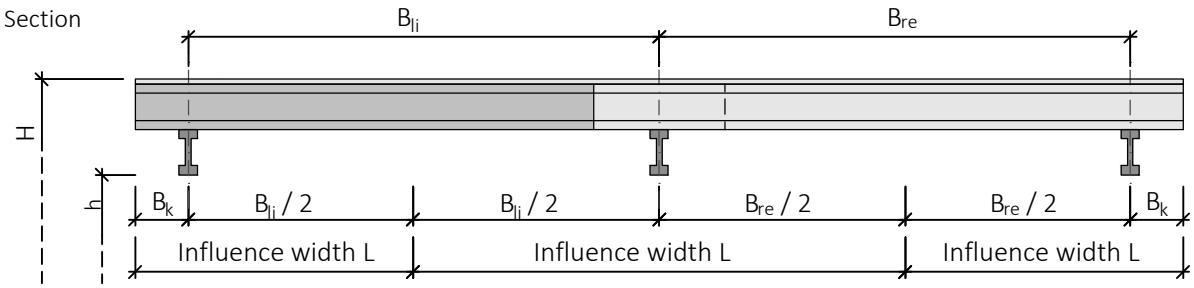
Division boarding support beam for deck boarding

Possible boarding support beam spacing a for deck boarding

Number of fields n	4	5	6	7	8	9	10	11	12	13	14	15
Board length b = 2,50 m	0,63	0,50	0,42	0,36	0,31	0,28	0,25	0,23	0,21	0,19	0,18	0,17
Board length b = 2,00 m	0,50	0,40	0,33	0,29	0,25	0,22	0,20	0,18	0,17			



The influence width L is determined from the load share, which is accounted for the primary beam.
For the edge primary beam is $L = B_k + B_{li} / 2$ respectively $L = B_k + B_{re} / 2$
For the intermediate primary beam is $L = (B_{li} + B_{re}) / 2$



3a *Prop spacing s and prop force P for primary beam with influence width according to design class A and B1*

The tables 3a and 4a apply to design class A and B1. The demarcation of the design class must be observed.

Table 3a

		Prop spacing S (m)
		Prop force P (kN)

d	q	Influence width L								
		1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00
m	kN /m²	I	I	I	I	I	I	I	I	I
0,1	4,4	2,72	2,53	2,38	2,26	2,14	2,02	1,84	1,67	1,53
		13,0	15,1	17,1	18,9	20,5	21,8	22,0	22,0	22,0
0,12	4,9	2,62	2,44	2,29	2,17	2,03	1,83	1,65	1,50	1,37
		14,0	16,2	18,3	20,3	21,7	22,0	22,0	22,0	22,0
0,14	5,4	2,54	2,36	2,22	2,07	1,87	1,66	1,50	1,36	1,25
		14,9	17,3	19,6	21,3	22,0	22,0	22,0	22,0	22,0
0,16	5,9	2,46	2,29	2,14	1,95	1,71	1,52	1,37	1,24	1,14
		15,9	18,4	20,6	22,0	22,0	22,0	22,0	22,0	22,0
0,18	6,4	2,40	2,23	2,05	1,80	1,57	1,40	1,26	1,15	1,05
		16,8	19,4	21,5	22,0	22,0	22,0	22,0	22,0	22,0
0,2	6,9	2,34	2,16	1,95	1,67	1,46	1,30	1,17	1,06	0,97
		17,6	20,4	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,22	7,4	2,28	2,09	1,81	1,55	1,36	1,21	1,09	0,99	0,91
		18,5	21,1	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,24	7,9	2,23	2,02	1,70	1,46	1,27	1,13	1,02	0,93	0,85
		19,3	21,8	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,26	8,4	2,19	1,92	1,60	1,37	1,20	1,06	0,96	0,87	0,80
		20,1	22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,28	8,9	2,13	1,81	1,51	1,29	1,13	1,00	0,90	0,82	0,75
		20,7	22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,3	9,4	2,07	1,71	1,43	1,22	1,07	0,95	0,86	0,78	0,71
		21,3	22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,35	10,7	1,86	1,49	1,24	1,07	0,93	0,83	0,75	0,68	0,62
		22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,4	12,1	1,65	1,32	1,10	0,94	0,83	0,73	0,66	0,60	0,55
		22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,45	13,4	1,48	1,19	0,99	0,85	0,74	0,66	0,59	0,54	0,49
		22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0
0,5	14,8	1,35	1,08	0,90	0,77	0,67	0,60	0,54	0,49	0,45
		22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0	22,0

A

B1

Deflection of the primary beam max. S/500 for loading in acc. with DIN EN 12812. When using the table, observe the maximum allowable primary beam spacing in accordance with '2'.

If the prop force according to table (3a) is greater than allowable prop force according to table (4a), the prop spacing must be reduced.

$$\text{New spacing S} = \text{spacing S} \times \frac{\text{All. load according to '4a'}}{\text{Exist. load in acc. with '3a'}}$$

4a *Loading tables for NOE steel tubular props*

Allowable load in accordance with EN 1065

Table 4a

	Prop BD 25 Part No. 697725	Prop CD 30 Part No. 697730	Prop CD 35 Part No. 697735	Prop CD 40 Part No. 697740	Prop CD 55 Part No. 697755
A (m)	P (kN)	P (kN)	P (kN)	P (kN)	P (kN)
1,50	36,1				
1,60	36,1				
1,70	35,0				
1,80	32,9	36,1			
1,90	30,7	36,1			
2,00	29,5	36,1	36,1		
2,10	28,3	36,1	36,1		
2,20	27,2	36,1	36,1		
2,30	26,2	36,1	36,1	36,1	
2,40	24,1	34,0	36,1	36,1	
2,50	22,1	31,7	36,1	36,1	
2,60		29,3	35,5	36,1	
2,70		27,0	34,3	36,1	
2,80		24,6	33,0	36,1	
2,90		22,8	31,8	36,1	
3,00		21,0	30,1	36,1	36,1
3,10			28,4	36,1	36,1
3,20			26,7	36,1	36,1
3,30			24,9	34,2	36,1
3,40			23,1	32,2	36,1
3,50			21,4	30,3	36,1
3,60				28,4	36,1
3,70				26,5	36,1
3,80				24,8	36,1
3,90				23,2	36,1
4,00				21,6	36,1
4,10					36,1
4,20					36,1
4,30					36,1
4,40					36,1
4,50					36,1
4,60					36,1
4,70					35,8
4,80					33,9
4,90					32,1
5,00					30,2
5,10					28,7
5,20					27,1
5,30					25,6
5,40					24,1
5,50					22,5

3b *Prop spacing S and prop force P for primary beam with influence width according to design class B2*

Table 3b

	Prop spacing S (m)
	Prop force P (kN)

d	q	Influence width L								
		1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00
m	kN /m²	I	I	I	I	I	I	I	I	I
0,1	4,4	2,60	2,41	2,27	2,14	2,00	1,78	1,60	1,45	1,33
		12,4	14,4	16,3	17,9	19,1	19,1	19,1	19,1	19,1
0,12	4,9	2,50	2,32	2,19	2,02	1,79	1,59	1,43	1,30	1,20
		13,4	15,5	17,5	18,9	19,1	19,1	19,1	19,1	19,1
0,14	5,4	2,42	2,25	2,08	1,86	1,63	1,44	1,30	1,18	1,08
		14,3	16,6	18,4	19,1	19,1	19,1	19,1	19,1	19,1
0,16	5,9	2,35	2,18	1,98	1,70	1,49	1,32	1,19	1,08	0,99
		15,1	17,5	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,18	6,4	2,29	2,09	1,83	1,57	1,37	1,22	1,10	1,00	0,91
		16,0	18,3	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,2	6,9	2,23	2,02	1,69	1,45	1,27	1,13	1,02	0,92	0,85
		16,8	19,0	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,22	7,4	2,18	1,89	1,58	1,35	1,18	1,05	0,95	0,86	0,79
		17,6	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,24	7,9	2,10	1,77	1,48	1,27	1,11	0,98	0,89	0,81	0,74
		18,2	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,26	8,4	2,04	1,67	1,39	1,19	1,04	0,93	0,83	0,76	0,69
		18,7	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,28	8,9	1,97	1,57	1,31	1,12	0,98	0,87	0,79	0,71	0,66
		19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,3	9,4	1,86	1,49	1,24	1,06	0,93	0,83	0,74	0,68	0,62
		19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,35	10,7	1,62	1,30	1,08	0,93	0,81	0,72	0,65	0,59	0,54
		19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,4	12,1	1,44	1,15	0,96	0,82	0,72	0,64	0,57	0,52	0,48
		19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,45	13,4	1,29	1,03	0,86	0,74	0,65	0,57	0,52	0,47	0,43
		19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1
0,5	14,8	1,17	0,94	0,78	0,67	0,59	0,52	0,47	0,43	0,39
		19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1	19,1

Deflection of the primary beam max. S/500 for loading in acc. with DIN EN 12812. When using the table, observe the maximum allowable primary beam spacing in accordance with '2'.

The influence width L must be determined as specified for the design class.

If the prop force according to table (3b) is greater than allowable prop force according to table (4b), the prop spacing must be reduced.

$$\text{New spacing S} = \text{spacing S} \times \frac{\text{All. load according to '4b'}}{\text{Exist. load in acc. with '3b'}}$$

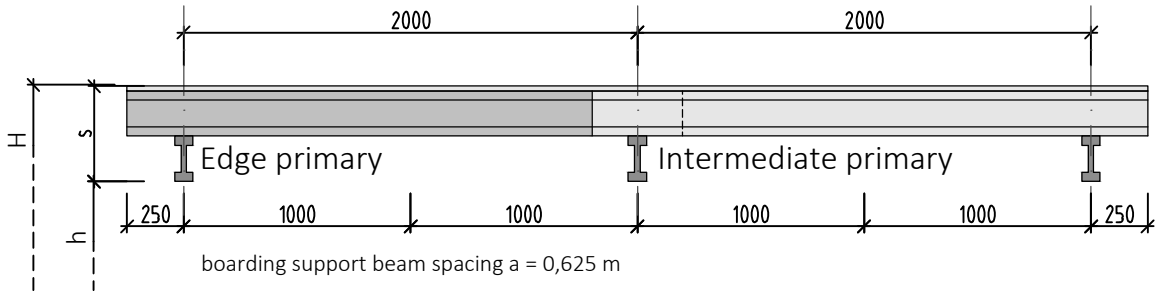
4b *Loading tables for NOE steel tubular props*

All. load according to EN 1065 reduced with Factor 1/1,15

Table 4b

	Prop BD 25 Part No. 697725	Prop CD 30 Part No. 697730	Prop CD 35 Part No. 697735	Prop CD 40 Part No. 697740	Prop CD 55 Part No. 697755
A (m)	P (kN)	P (kN)	P (kN)	P (kN)	P (kN)
1,50	31,4				
1,60	31,4				
1,70	30,4				
1,80	28,6	31,4			
1,90	26,7	31,4			
2,00	25,7	31,4	31,4		
2,10	24,6	31,4	31,4		
2,20	23,7	31,4	31,4		
2,30	22,8	31,4	31,4	31,4	
2,40	21,0	29,6	31,4	31,4	
2,50	19,2	27,6	31,4	31,4	
2,60		25,5	30,9	31,4	
2,70		23,5	29,8	31,4	
2,80		21,4	28,7	31,4	
2,90		19,8	27,7	31,4	
3,00		18,3	26,2	31,4	31,4
3,10			24,7	31,4	31,4
3,20			23,2	31,4	31,4
3,30			21,7	29,7	31,4
3,40			20,1	28,0	31,4
3,50			18,6	26,3	31,4
3,60				24,7	31,4
3,70				23,0	31,4
3,80				21,6	31,4
3,90				20,2	31,4
4,00				18,8	31,4
4,10					31,4
4,20					31,4
4,30					31,4
4,40					31,4
4,50					31,4
4,60					31,4
4,70					31,1
4,80					29,5
4,90					27,9
5,00					26,3
5,10					25,0
5,20					23,6
5,30					22,3
5,40					21,0
5,50					19,6

Design example



a) Boarding support beam spacing (see table 1')
up to d = 0,32 m, max. a = 0,63 m > a_{all} = 0,625 m

b) Primary beam spacing B (see table 2)
for d = 0,28 m and a = 0,63 m, max. B = 2,43 m > B_{all} = 2,00 m

c) Influence width L

Edge primary : L = 0,25 + 1,00 = 1,25 m
intermediate primary : L = 1,00 + 1,00 = 2,00 m

Example 1:

Deck thickness d = 0,28 m
headroom H = 2,80 m
==> example class A

d) Prop spacing and prop force
(see table 3a)

Edge primary : S = 1,81 m, P = 22,0 kN
intermediate primary : S = 1,13 m, P = 22,0 kN

e) Prop selection (table. 4a)

Pull-out lenght
h = H - s = 2,80 - 0,421 = 2,379 m
selected Europrop CD30
at pull-out 2,40 m ist P_{All} = 34 kN ≥ P_{Exist}

The prop spacing must not be reduced.

Example 2:

Deck thickness d = 0,28 m
headroom H = 3,40 m
If the formwork is proved according to the design class B1, the tables in example 1 apply. Otherwise the tables must be used for the design class B2.
==> example class B2

d) Prop spacing and prop force
(see table 3b)

Edge primary : S = 1,57 m, P = 19,1 kN
Intermediate primary : S = 0,98 m, P = 19,1 kN

e) Prop selection (table 4b)

Pull-out lenght
h = H - s = 3,40 - 0,421 = 2,979 m
selected Europrop CD30 at pull-out 3,00 m is
P_{All} = 18,3 kN < P_{Exist}

The prop force P is greater than allowable prop force, therefore the prop spacing must be reduced.

Edge primary:

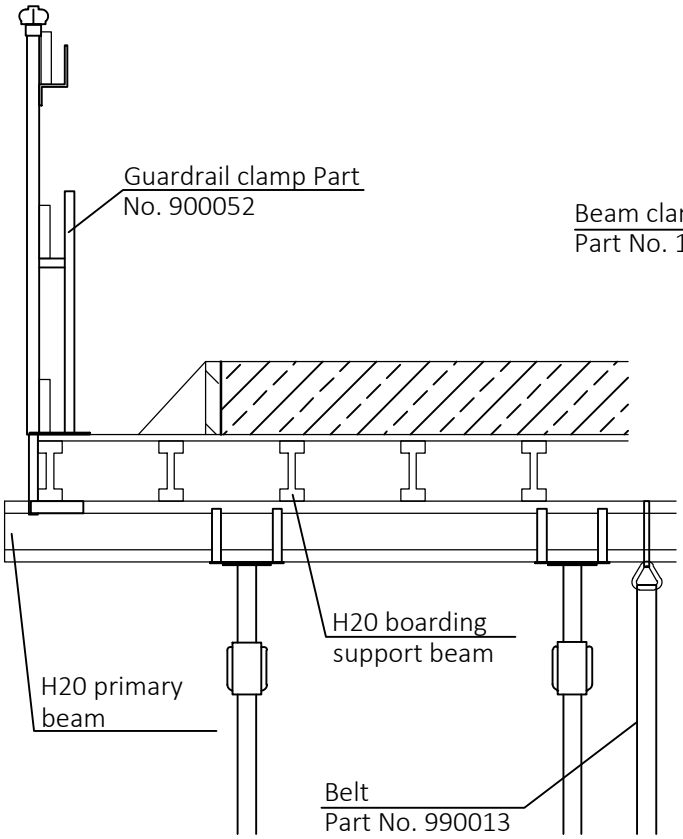
$$S_{new} = S \times \frac{18,3}{19,1} = 1,57 \times 0,96 = 1,51 \text{ m}$$

Intermediate primary:

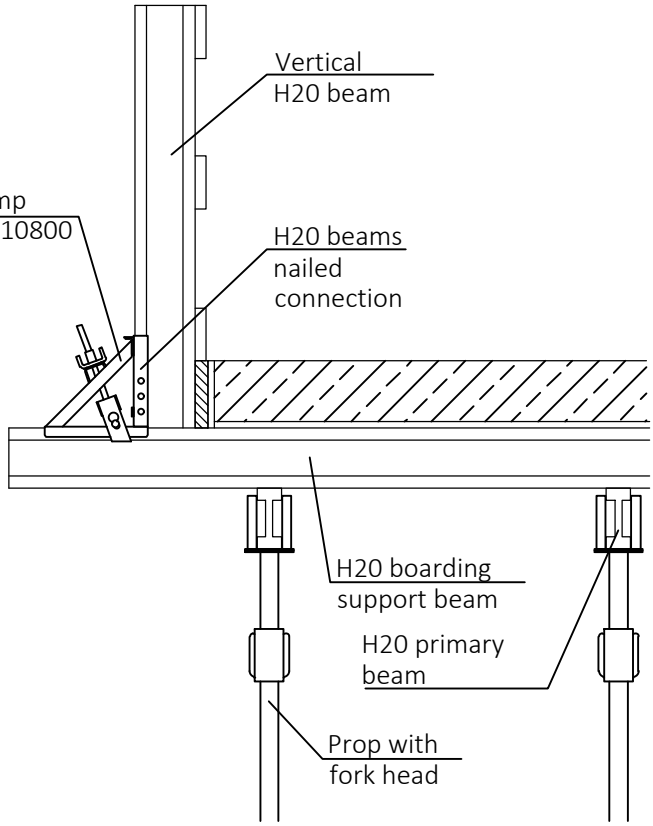
$$S_{new} = S \times \frac{18,3}{19,1} = 0,98 \times 0,96 = 0,94 \text{ m}$$

7 Stop-end form

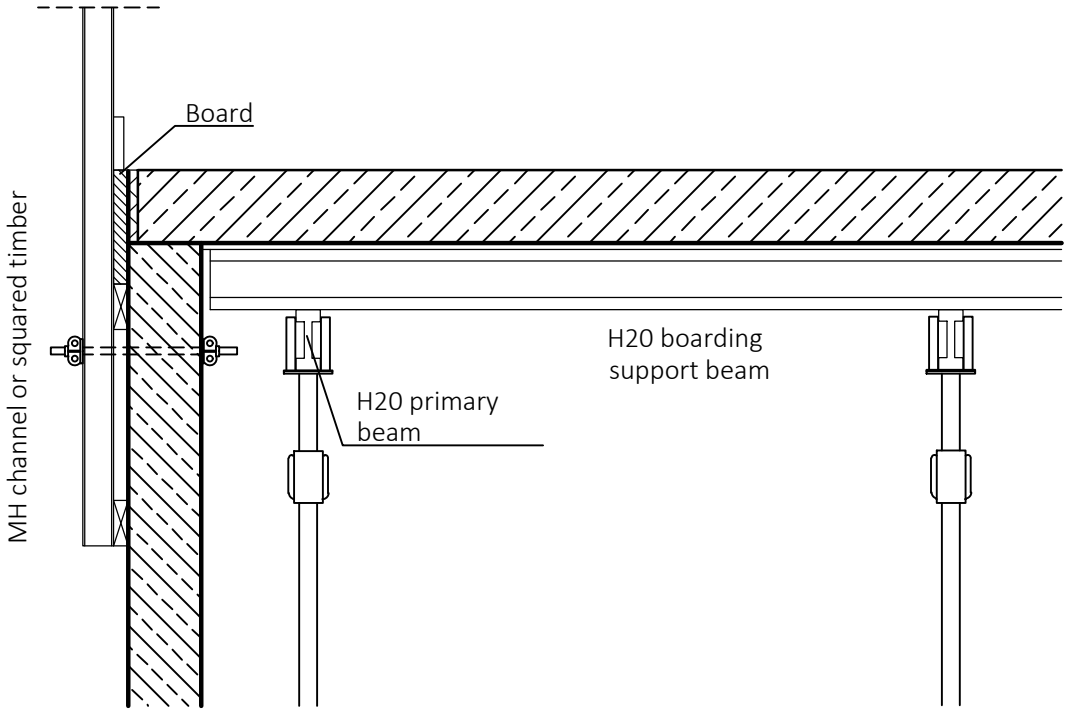
a) with guardrail clamp



b) with beam clamp



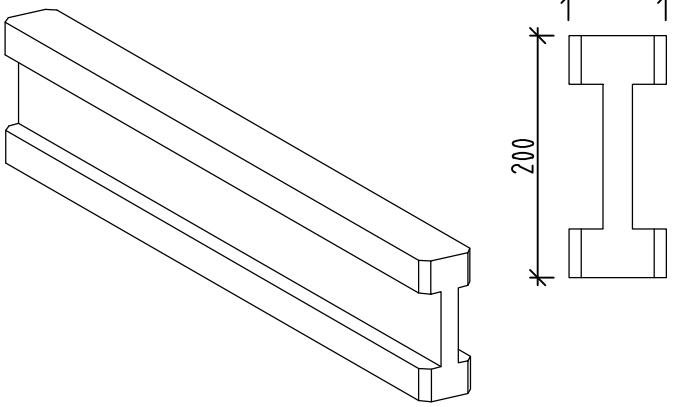
c) for enclosed spaces



8 Individual parts

NOE H20 - timber beam

in acc. with DIN EN 13377: 2002-11



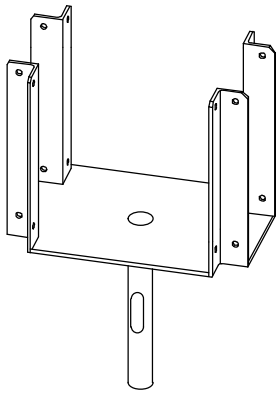
Structural properties

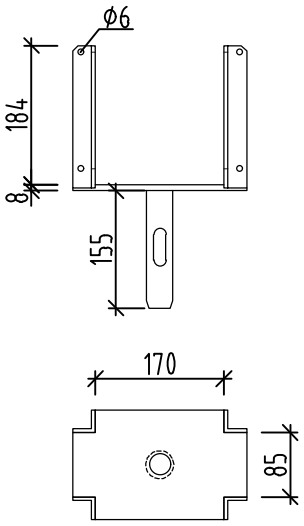
M_{zul} = 5.0 kNm
Q_{zul} = 11.0 kN
G = 5.0 kg/m

Part No.	Length (mm)	Weight (kg)
110590	5900	26,90
110490	4900	22,34
110390	3900	17,78
110330	3300	15,05
110290	2900	13,22
110245	2450	11,17

Fork head

Part No. 110715
Weight 4.1 kg



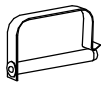


Fork head not for ADS deck props, Part No. 697510 and Part No. 697511 because there is no locking pin to secure the connection. Here fork head Part No. 110700 is used

Use the fork head only with locking pin e.g. spring pin

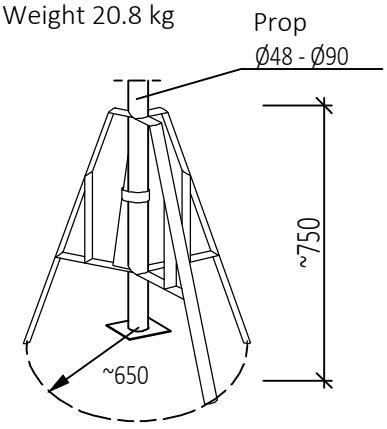
Spring pin 12x80

for fork head on steel tubular props
Part No. 555990



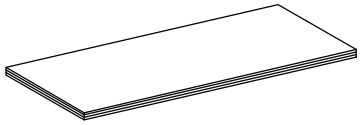
Folding tripod

Part No. 900072
Weight 20.8 kg



Panels

Three-ply board 21 mm, steel edge



Part No.	Length (mm)	Width (mm)	Weight (kg)	Area (m^2)
275201	2500	500	12,5	1,25
275101	2000	500	10,0	1,00
275001	1500	500	7,5	0,75

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Subject to technical modifications.
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