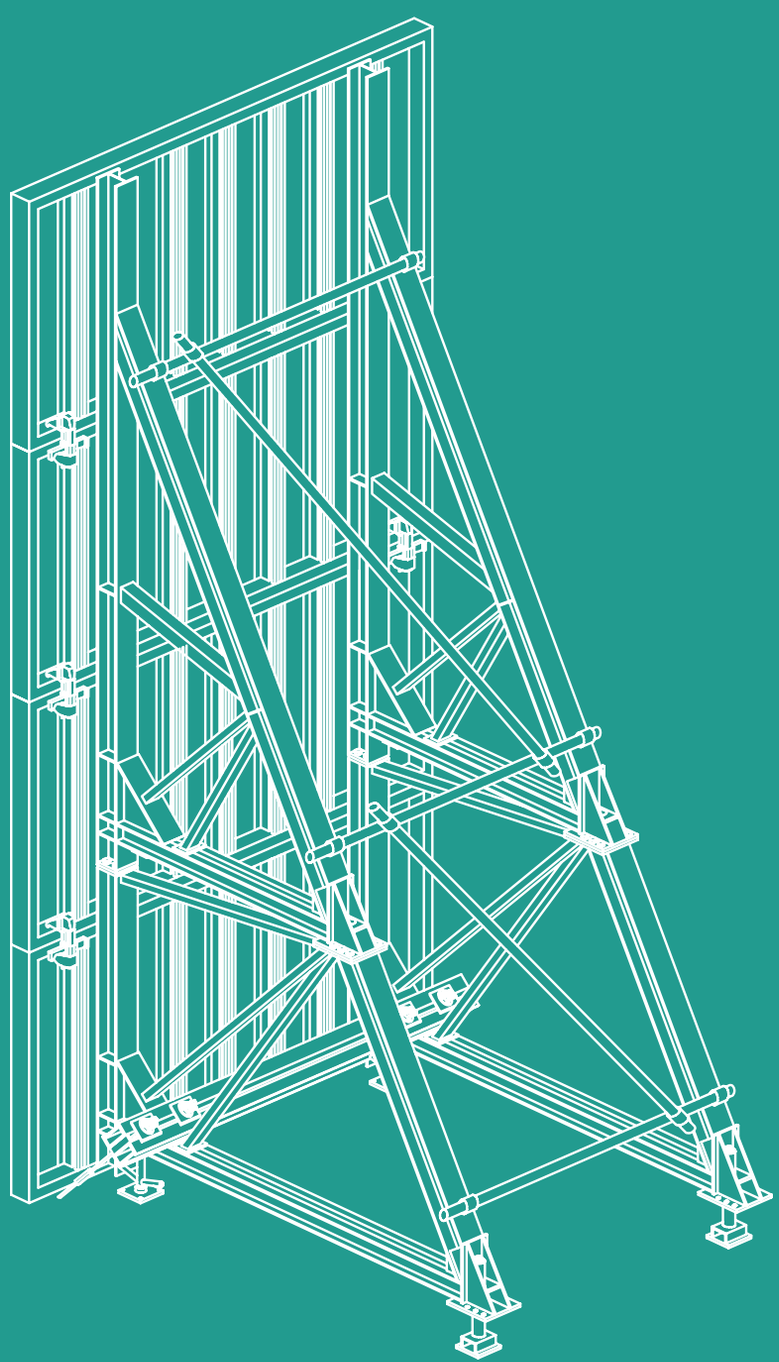
THE FORMWORK

NOE® strut

Dated: 01.2022

Assembly and Operating Manual



NOE strut

Assembly and Operating Manual

(Dated 01.2022)

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Inhalt

1 GSV guidelines, safety advice

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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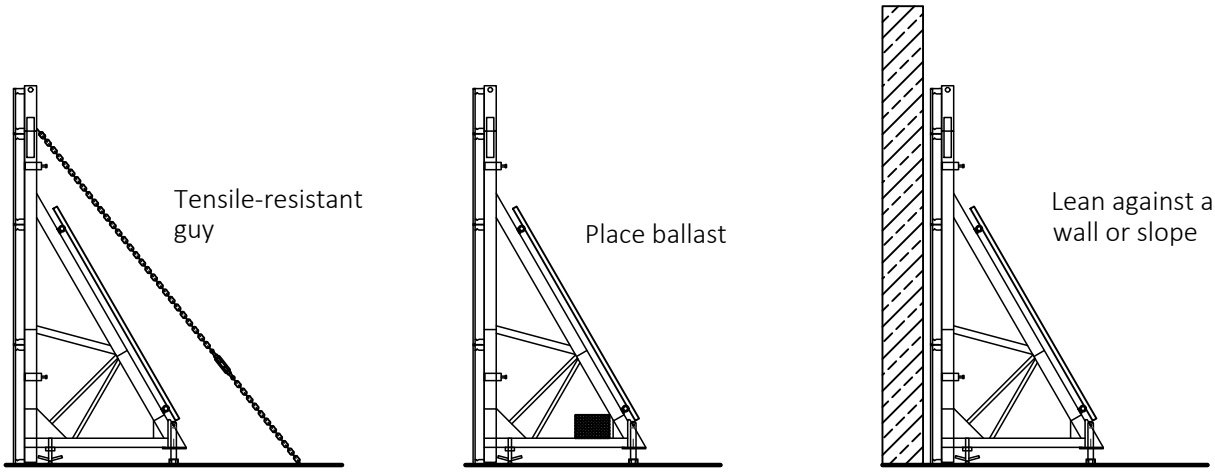
1.2 Use of NOE struts for walls with one formed face

When concreting walls with one formed face the force due to the concrete pressure must be transferred by the formwork and suitable stabilisers and anchors to the supporting ground. NOE struts are designed for this load transfer, and can be attached to NOE system formwork without any additional bracing.

Depending on the formwork height, there are solutions constructed on the modular principle that ensure economic and safe strut designs.

Their use requires compliance with the following basic requirements, which are not exhaustive:

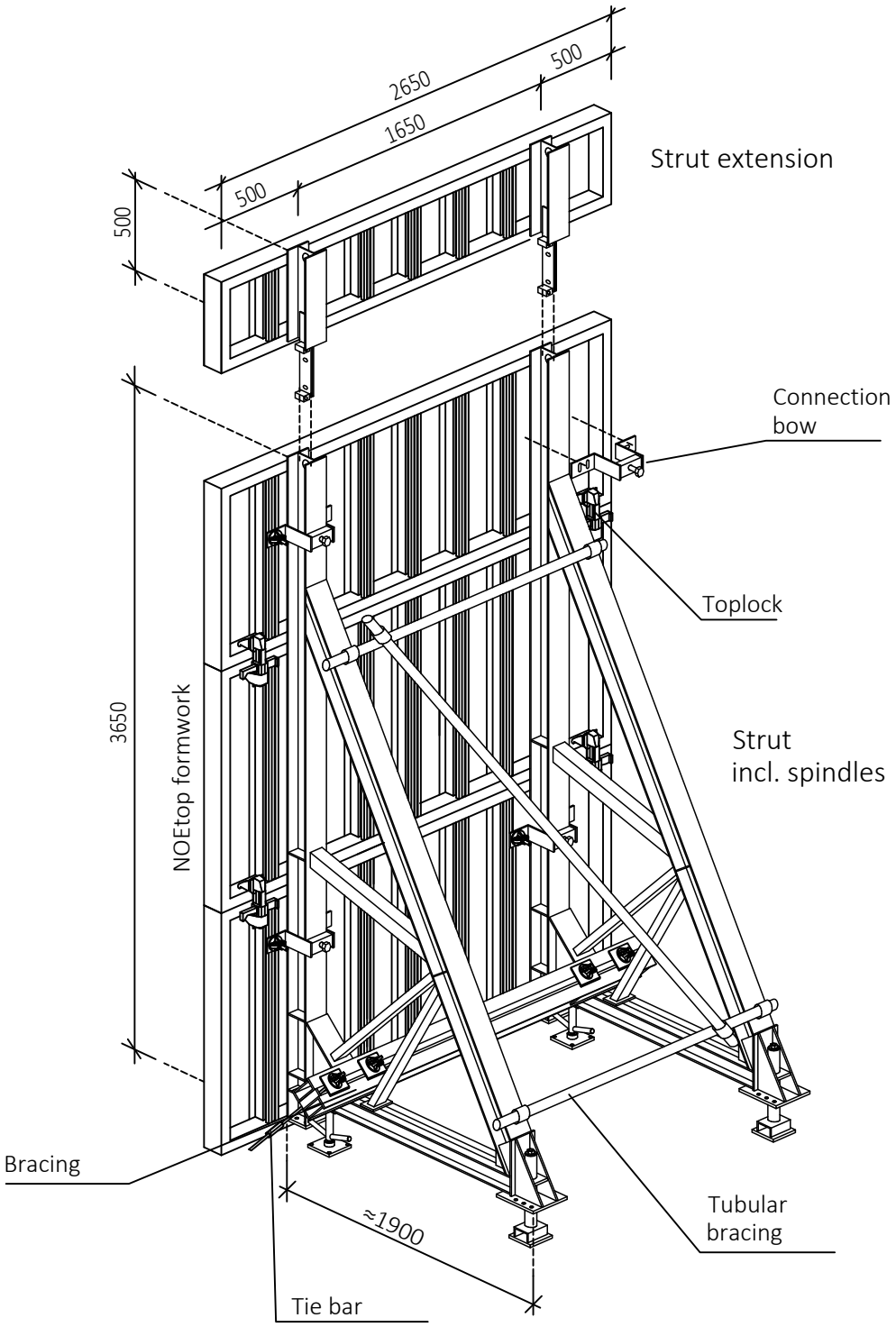
- The anchor rods must be designed and put in position before the floor slab or foundation is cast.
- The concrete strength of the components in which the anchor rods are held must be sufficiently great to be able to carry the anchor tension forces.
- Components that have to carry anchor forces are to be appropriately reinforced and sized.
- The opposite side of the wall (existing walls, lining, or similar) must also be able to carry the concrete pressure.
- To ensure the erected formwork element is structurally stable, it must be able to resist tension forces or be secured by other means (e.g. placing of ballast, erection against a wall or slope).



2 Overview of heavy strut

2.1 Schematic structure of base unit 2.65 m wide

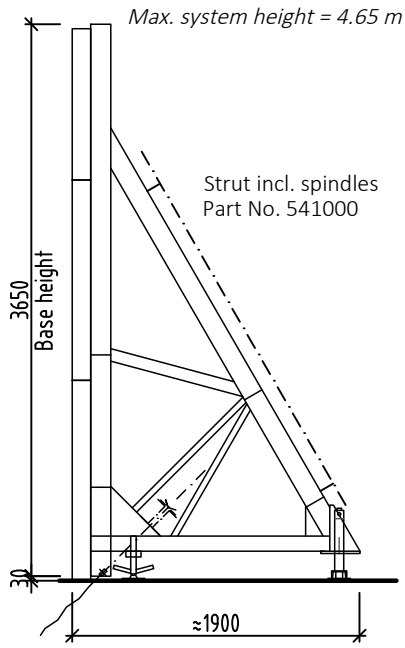
Height 3.65 m or 4.15 m (with extensions)



2.2 Overview of strut heights

Sections

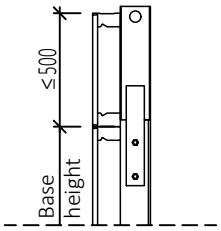
NOE strut H = 3.65 m



Extension for strut

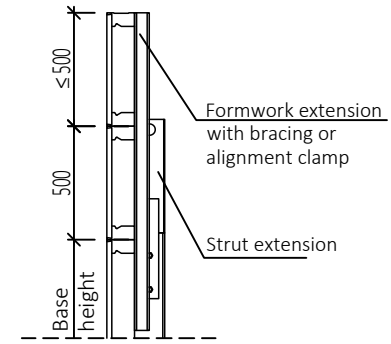
Part No. 541020

Attachment with 2 screws
M16x50 8.8
Part No. 313500



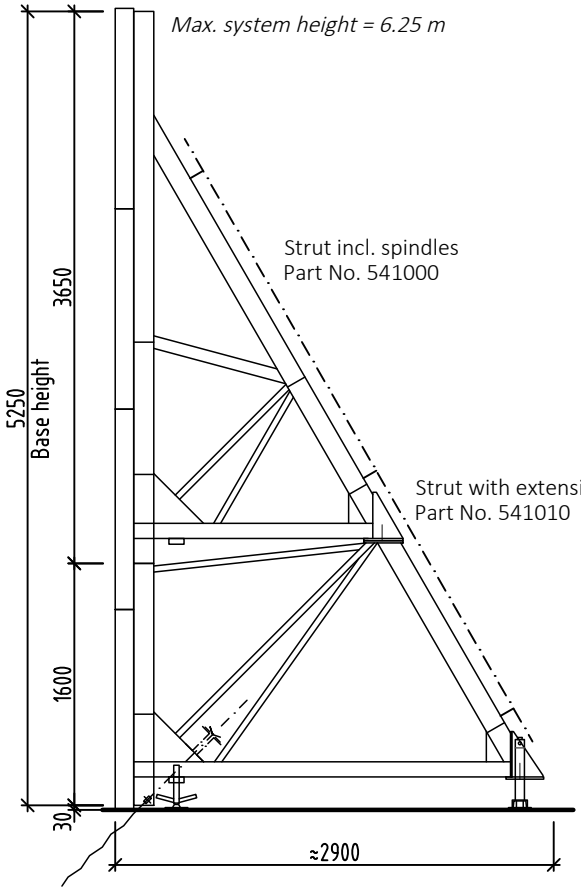
Max. system height:
Base height + 0.50 m

Additional formwork extensions

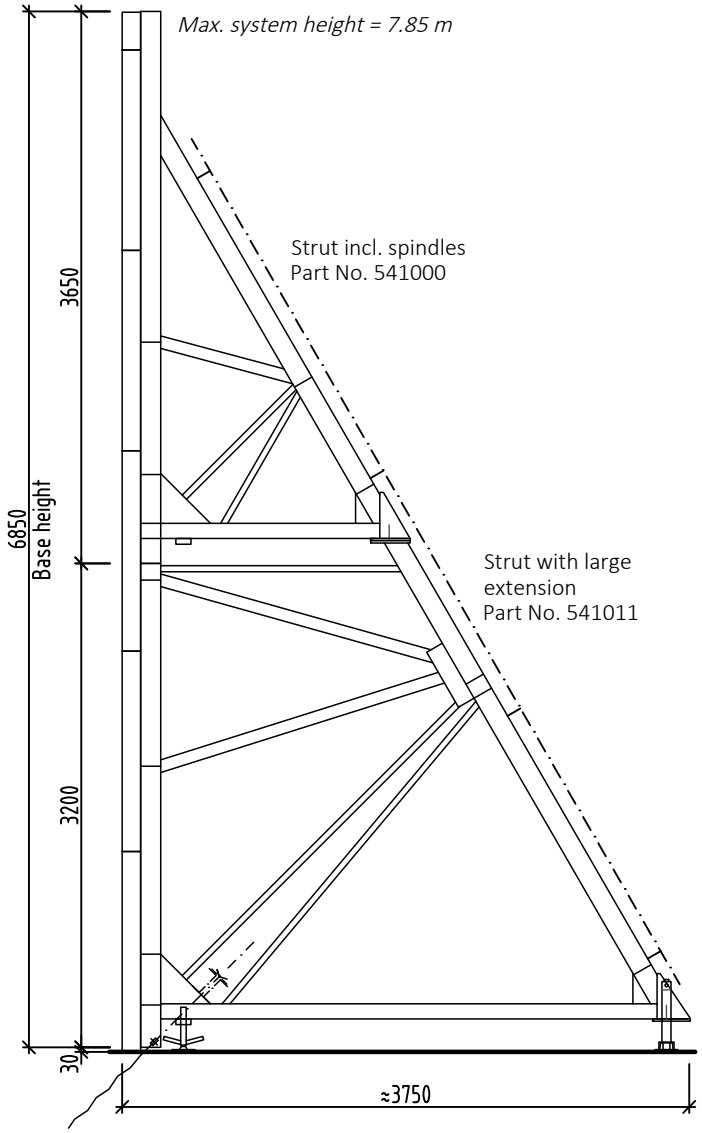


Max. system height:
Base height + 1.00 m

NOE strut H = 5.25 m



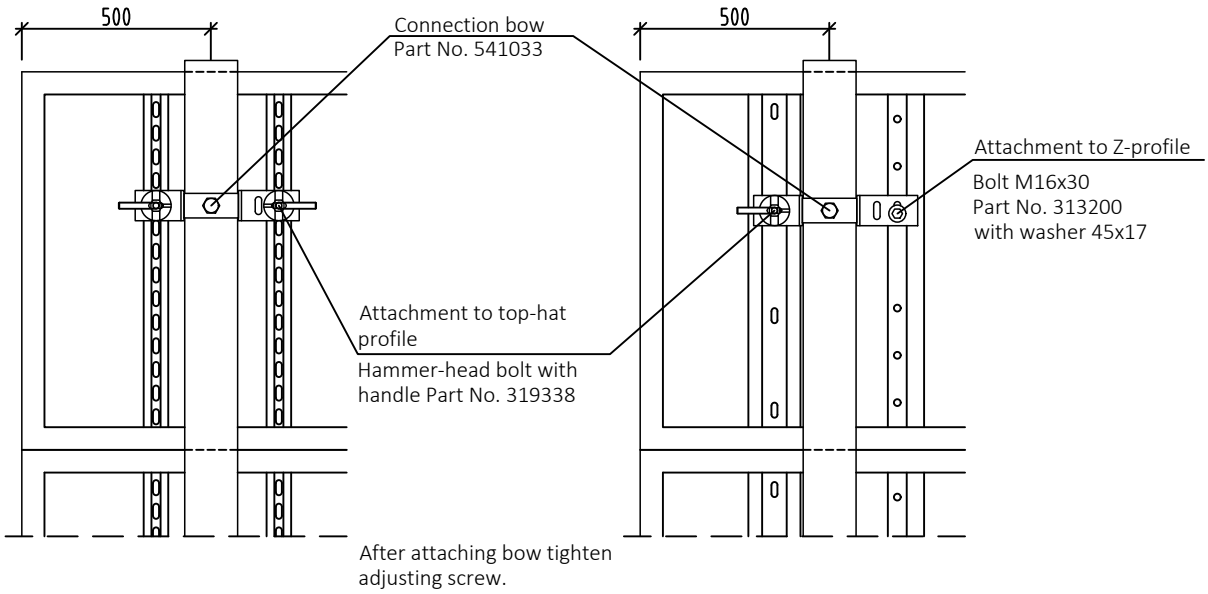
NOE strut H = 6.85 m



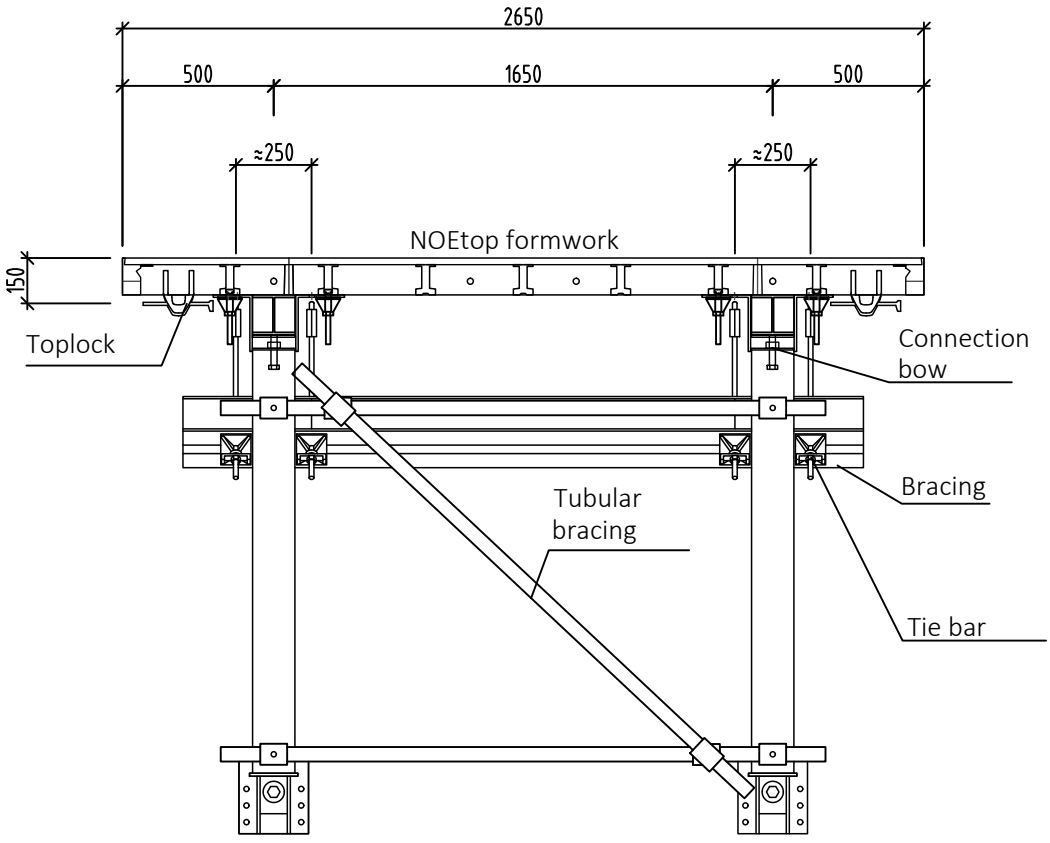
2.3 Attaching struts with connection bow

to NOEtop formwork

to TOP 2000 formwork

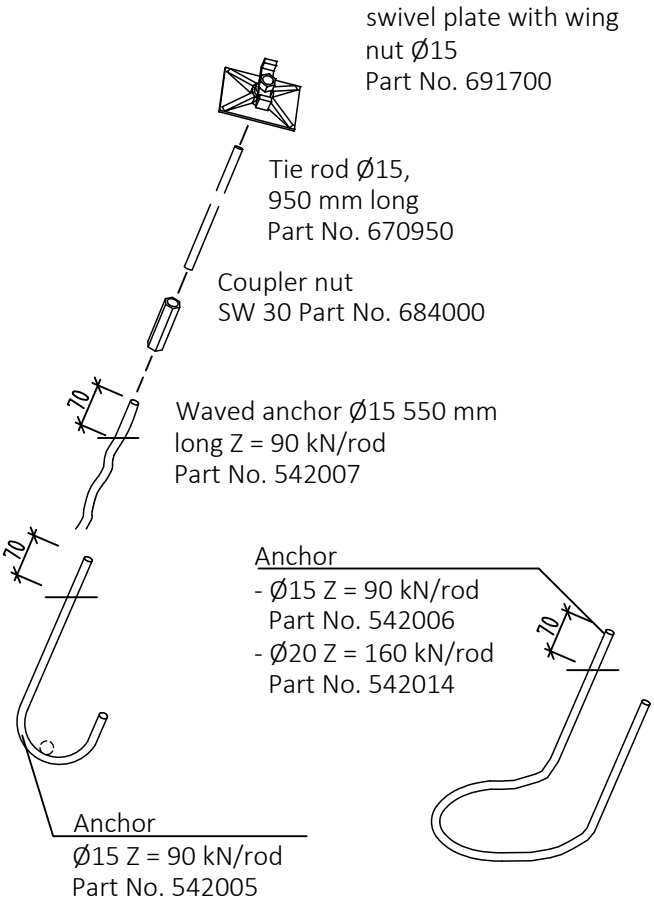


Plan

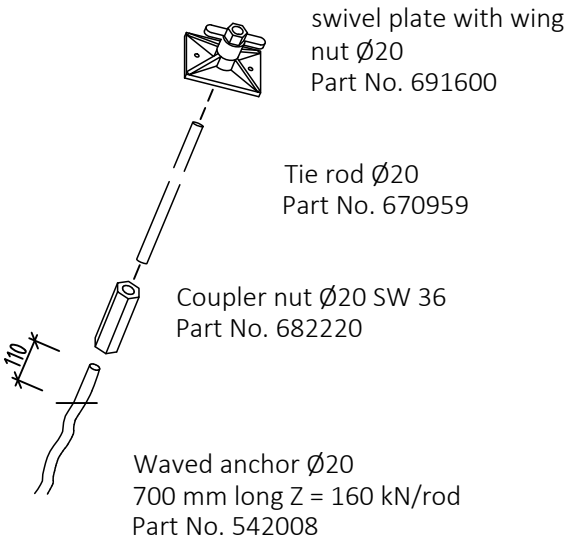


2.4 Fastening of struts

Tie rod Ø 15 mm



Tie rod Ø 20 mm

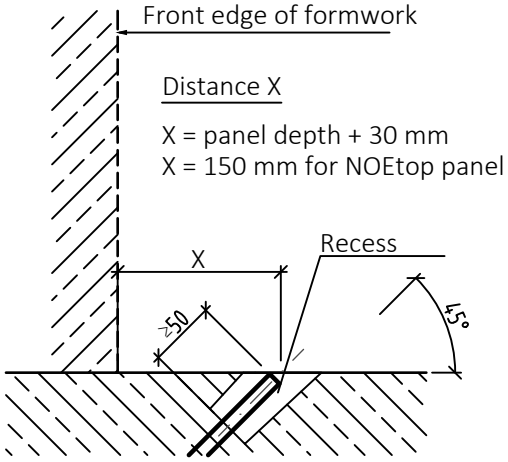


For the permissible tension loads given in this section, the concrete compressive strength must be at least 25 MN/m^2.

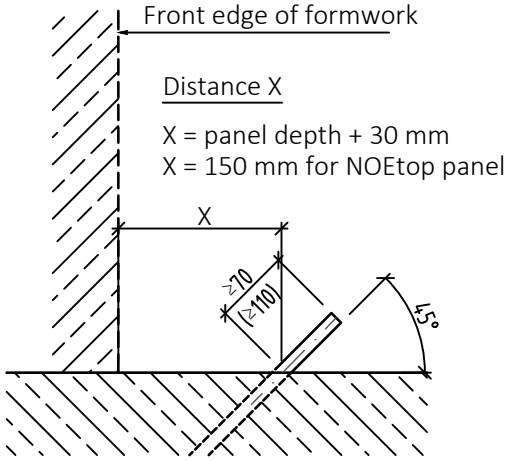
2.5 Spacing dimension for lost anchor installation

> 2 anchors per strut required placed 25 cm apart,
> i.e. 12.5 cm left and right of the strut axis respectively.

with recessed anchor rod

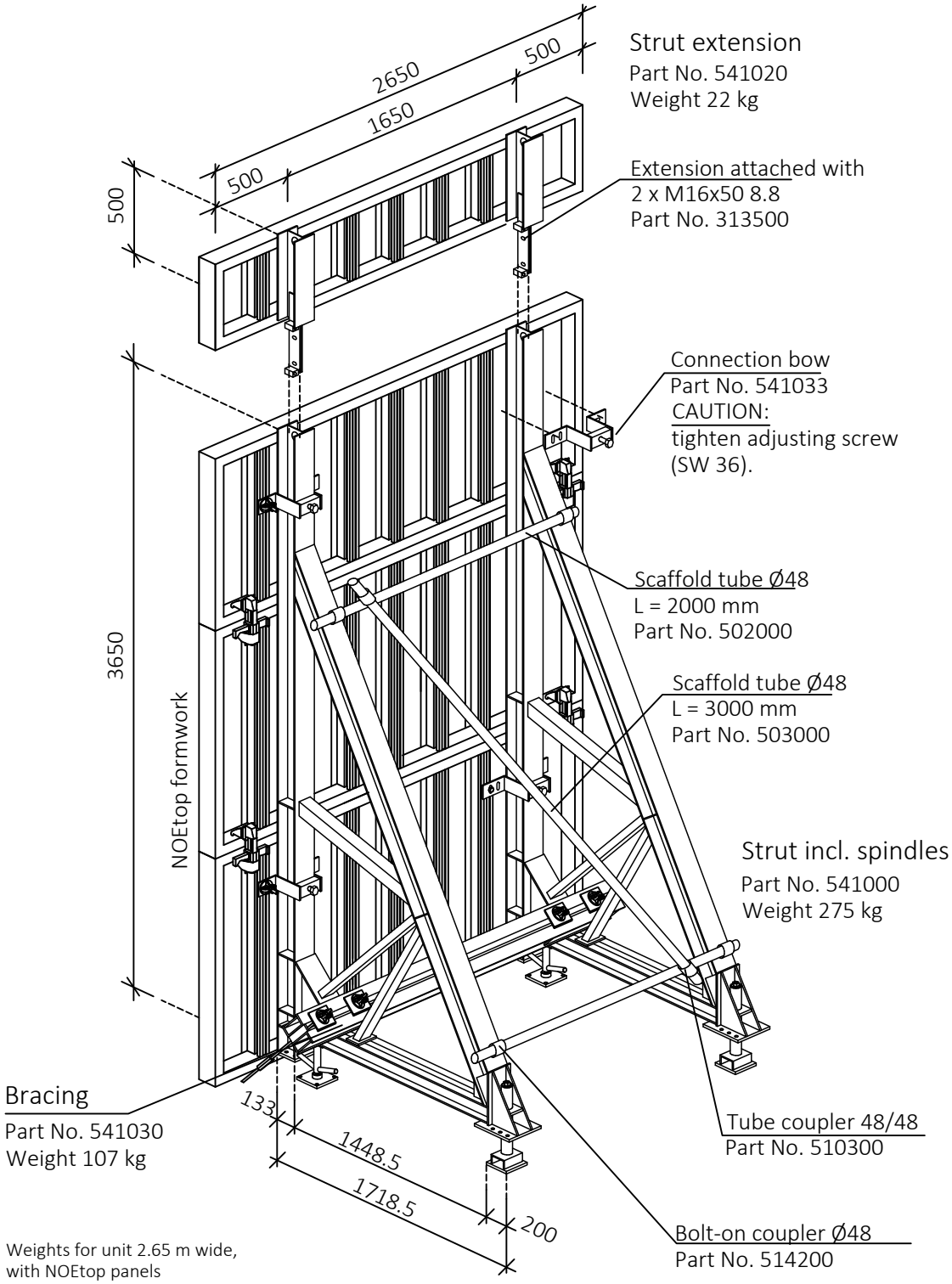


with projecting anchor rod



3 Strut base unit with NOEtop panels

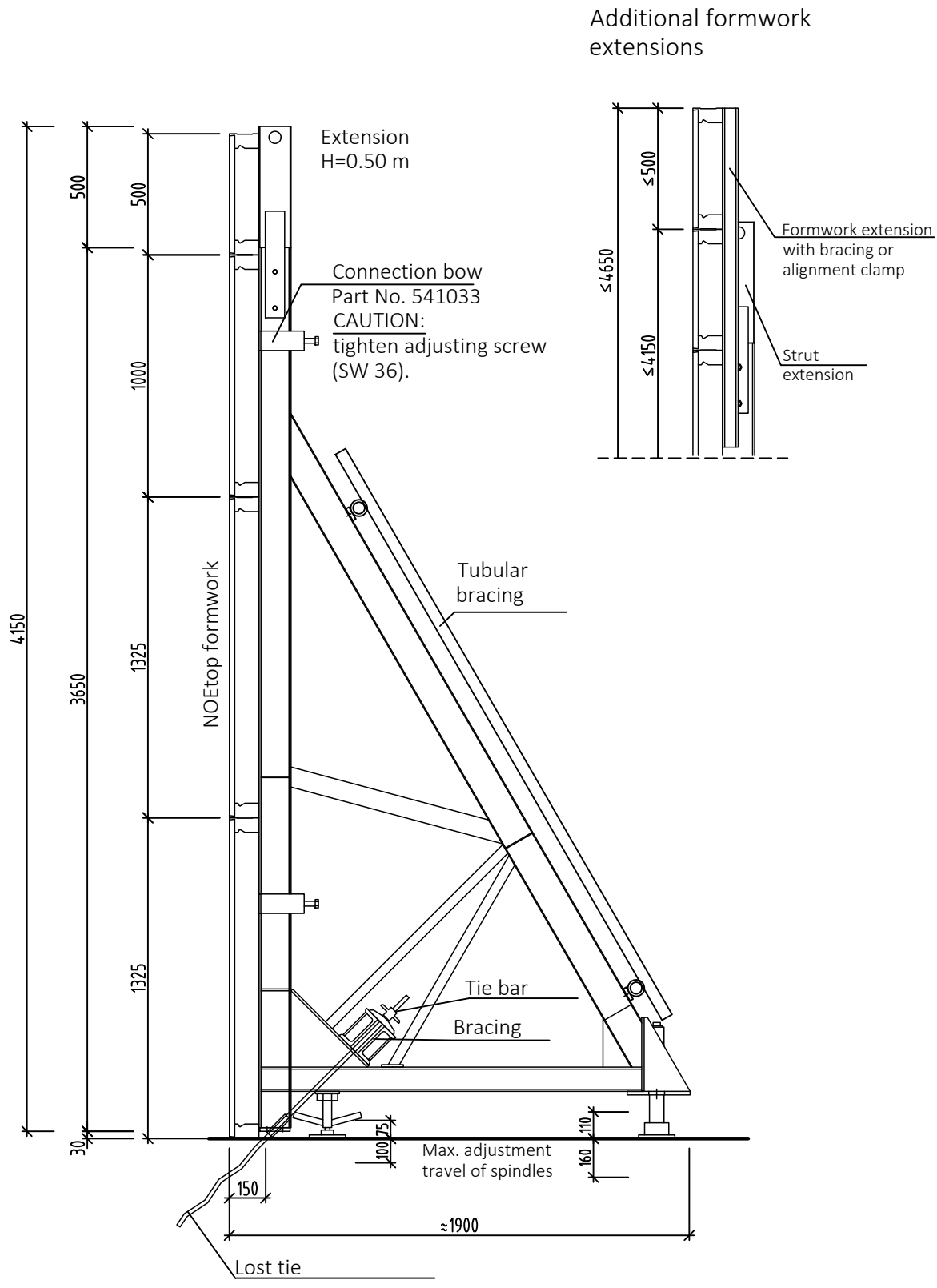
3.1 Height 3.65 m or 4.15 m (with extensions)



Weights for unit 2.65 m wide,
with NOEtop panels

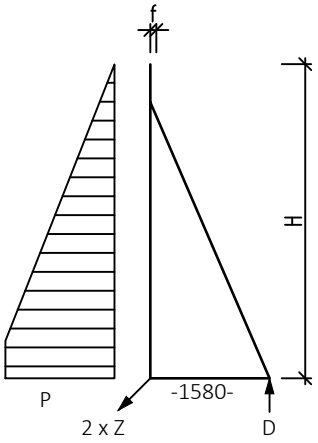
Height (m)	Weight (kg)
3.65	≈ 1350
4.15	≈ 1480

3.2 Section through base unit with extension



3.3 Structural system

Table 1 for strut without extension, influence width 1.325 m



with anchor rod Ø15 mm
(Perm. Z=91 kN)

H (m)	P (kN/m²)	D (kN)	Z (kN)
2.00	hydrost.	28.0	46.8
2.20	hydrost.	37.2	56.7
2.40	hydrost.	48.3	67.5
2.60	60	61.4	78.7
2.80	60	76.5	89.9
3.00	50	90.8	93.7
3.20	40	100.2	89.9
3.40	35	109.4	88.5
3.60	35	125.8	95.1

Deformation f < 3 mm

We recommend inclining the strut forward by 2/3 of the calculated deformation f.

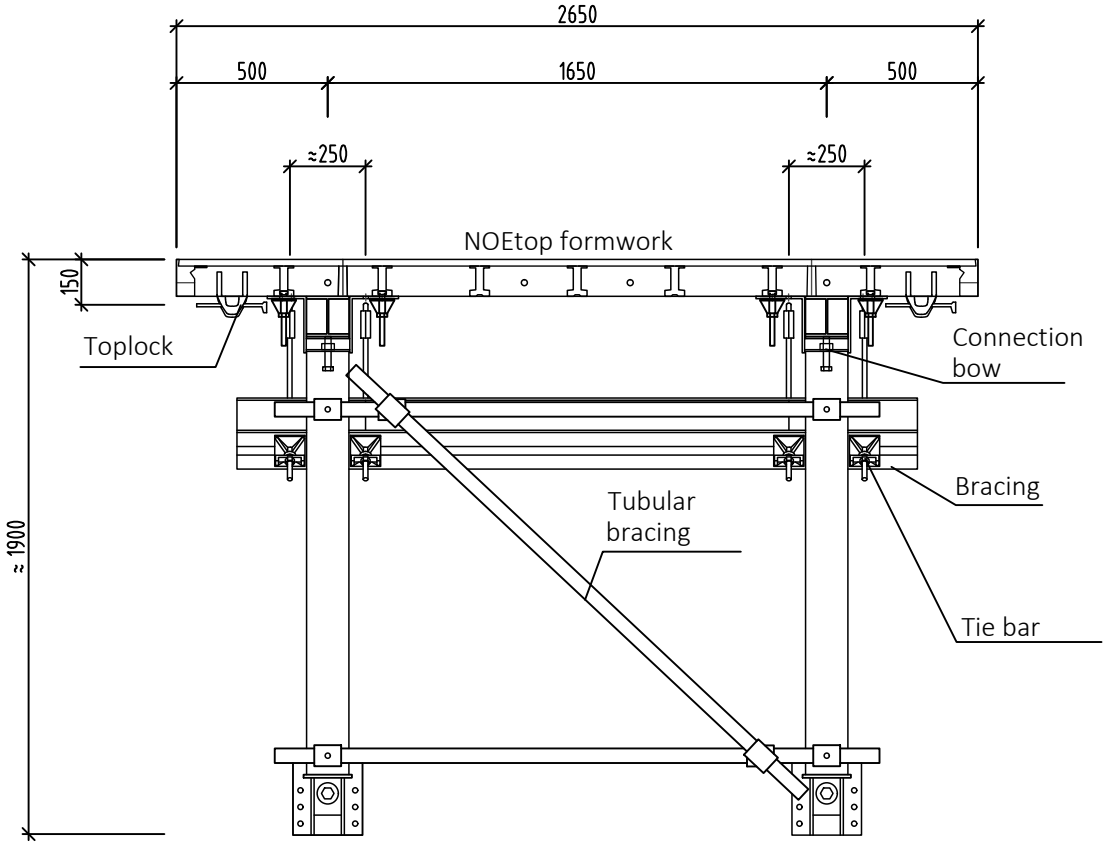
with anchor rod Ø20 mm
(Perm. Z=160 kN)

H (m)	P (kN/m²)	D (kN)	Z (kN)	f (mm)
3.00	60	93.6	101.2	1
3.20	60	112.7	112.4	2
3.40	60	133.8	123.7	3
3.60	60	157.0	134.9	4
3.80	60	182.1	146.2	5
4.00	60	209.3	157.4	7
4.20	55	230.9	163.3	9
4.40	40	220.9	156.2	13
4.60	35	225.6	159.5	18

Height 3.80 - 4.20 m
with extension 500 mm

Height 4.40 - 4.60 m with extension, top panel max. 500 mm high with alignment clamp extended (see section).

Plan view

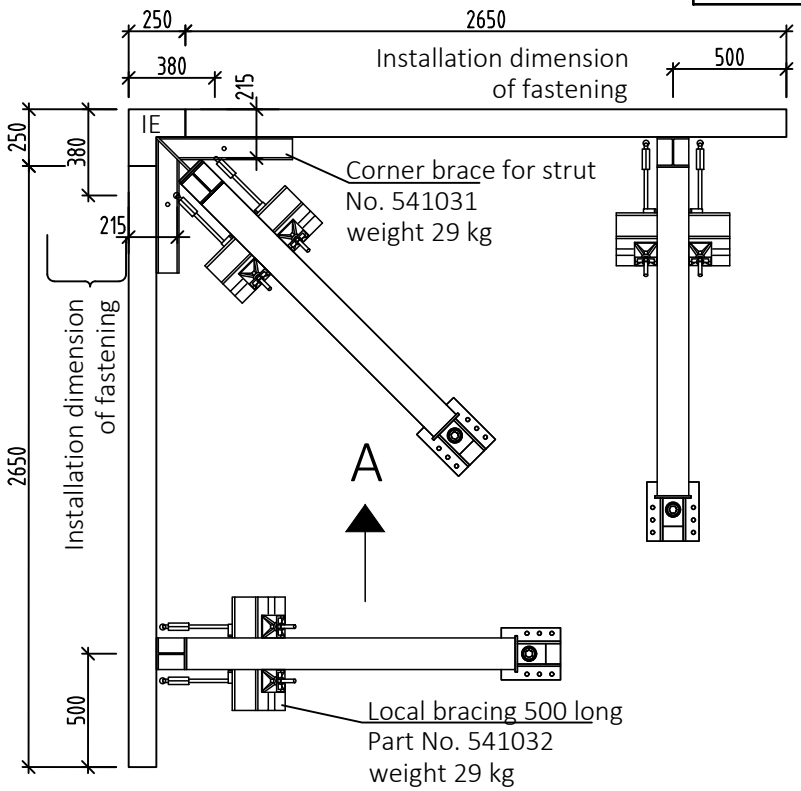


3.4 Strut for internal corners with NOEtop panel

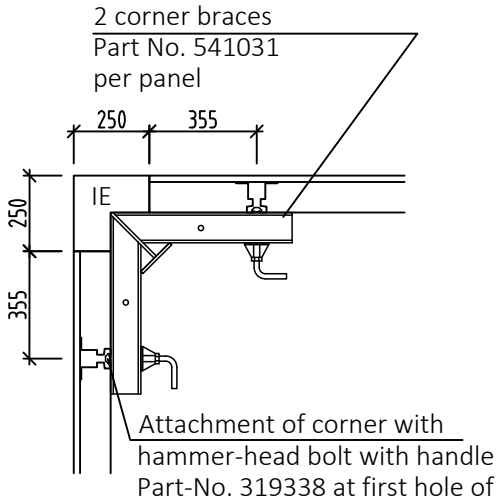
Formwork height max. 4.15 m (with extension)

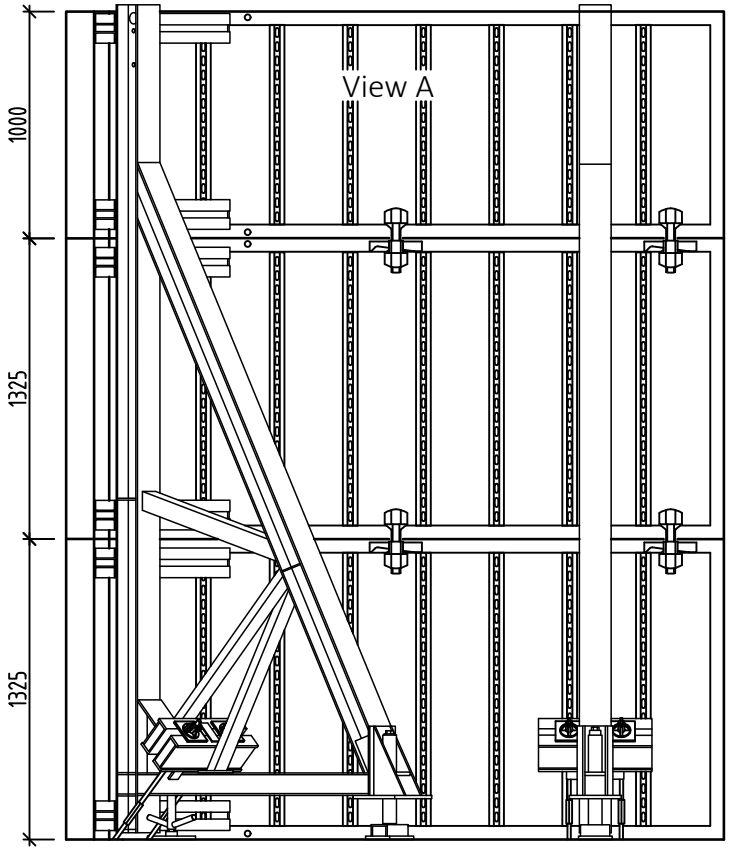
Caution: Move strut and formwork separately!

Plan view

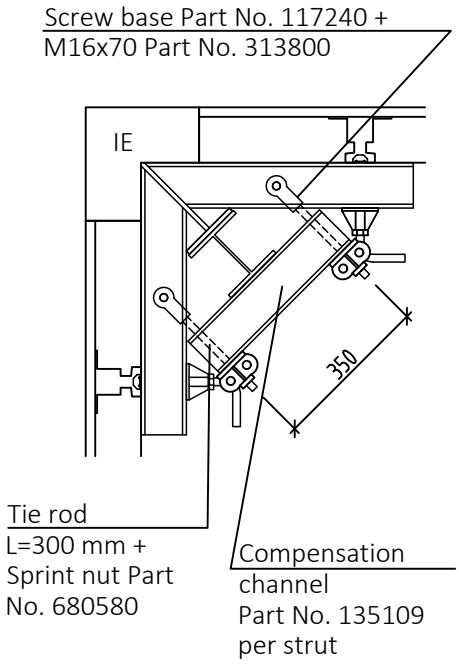


Detail of fastening of corner brace





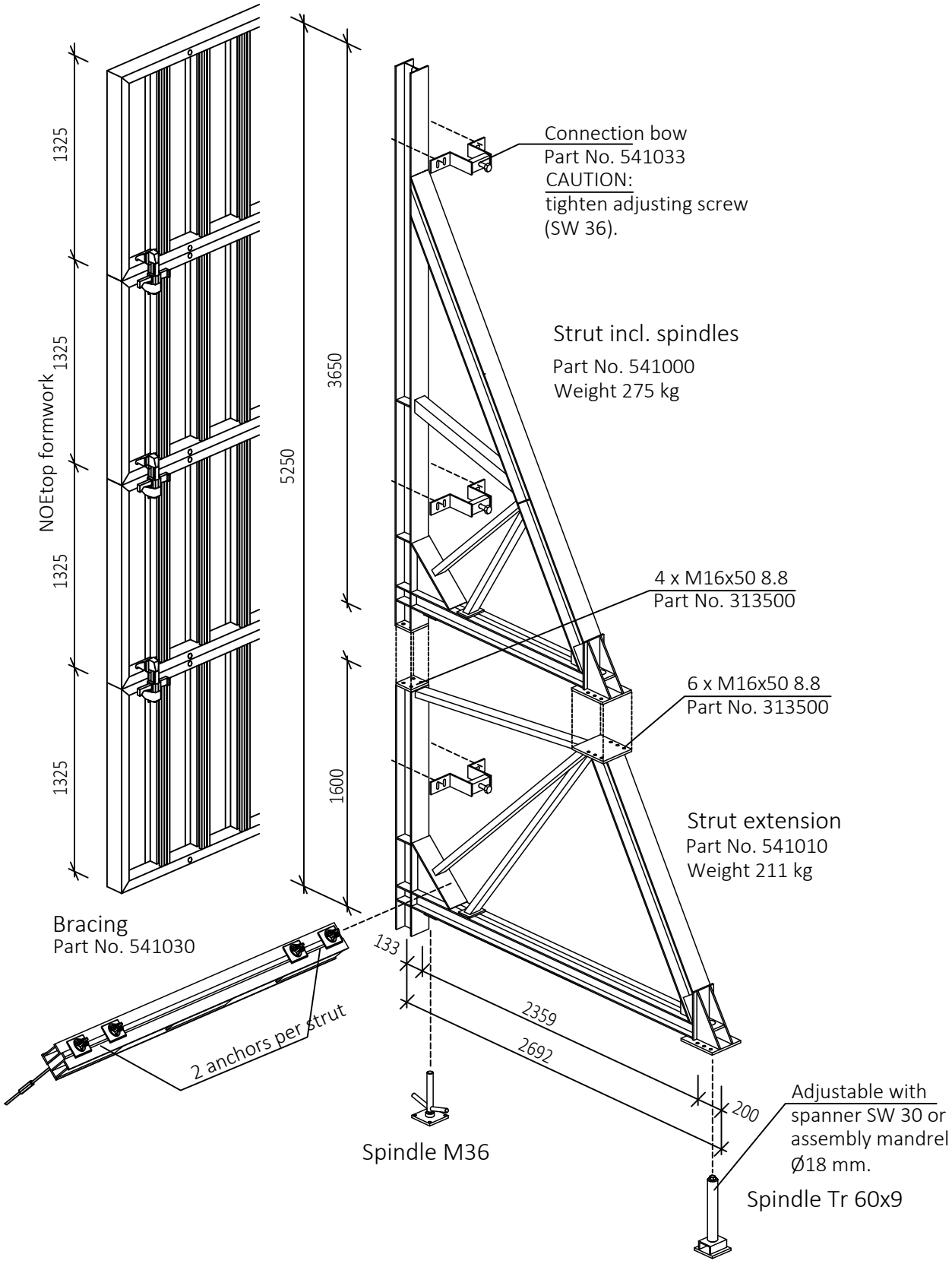
Detail of strut attachment



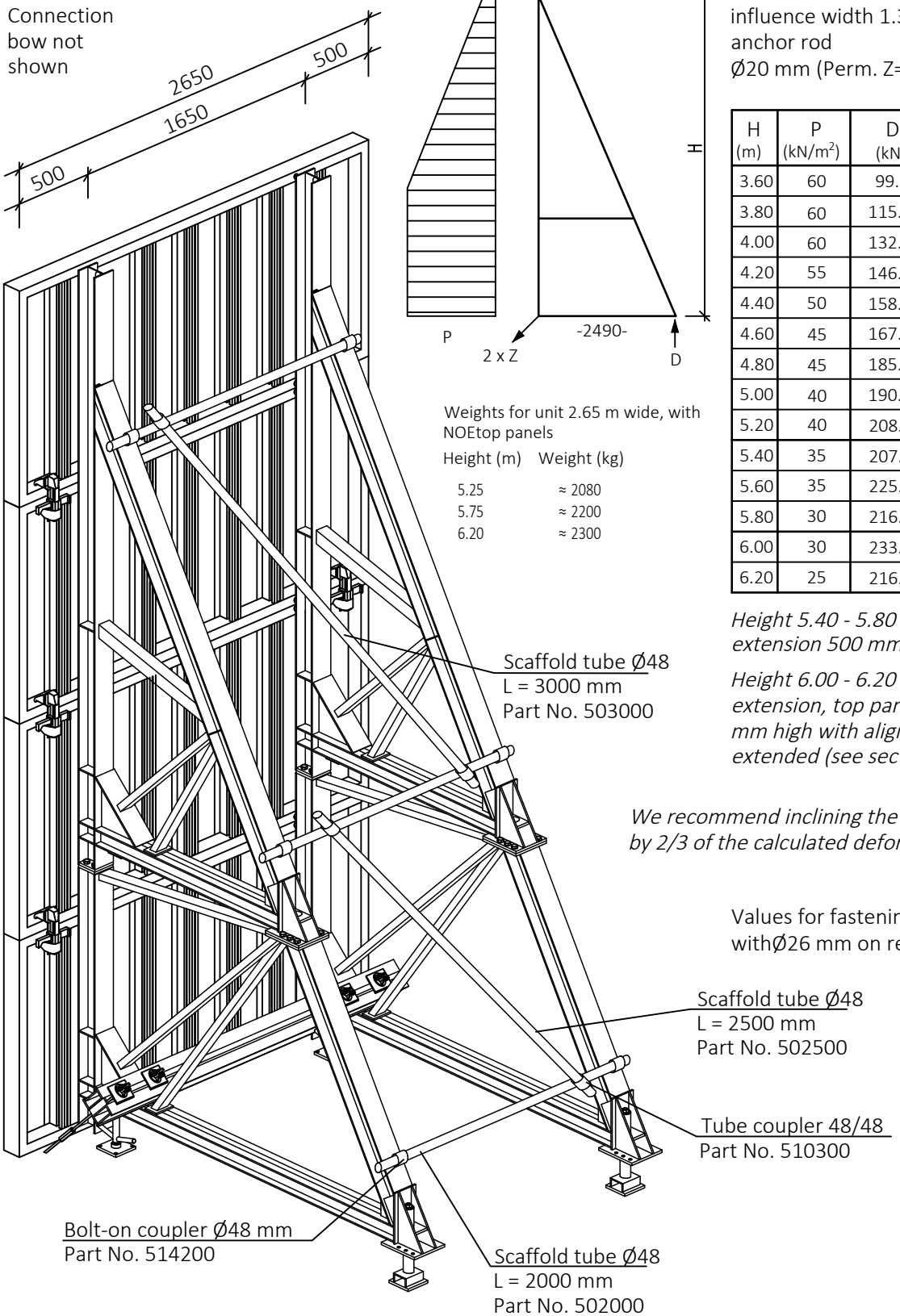
Concrete pressure in Table 1
for strut (base unit)

4 Strut base unit with extension

4.1 Height 5.25 m or 5.75 m (with extensions)



4.2 Formwork height with extensions up to 6.20 m



Weights for unit 2.65 m wide, with NOEtop panels

Height (m)	Weight (kg)
5.25	≈ 2080
5.75	≈ 2200
6.20	≈ 2300

Table 2
for strut with extension, influence width 1.325 m, anchor rod Ø20 mm (Perm. Z=160 kN)

H (m)	P (kN/m²)	D (kN)	Z (kN)	f (mm)
3.60	60	99.6	134.9	1
3.80	60	115.6	146.2	2
4.00	60	132.8	157.4	3
4.20	55	146.5	159.7	3
4.40	50	158.2	159.3	3
4.60	45	167.1	156.0	3
4.80	45	185.3	164.4	4
5.00	40	190.0	157.4	4
5.20	40	208.3	164.9	5
5.40	35	207.2	154.1	6
5.60	35	225.1	160.7	8
5.80	30	216.8	153.3	11
6.00	30	233.7	165.3	14
6.20	25	216.7	153.2	20

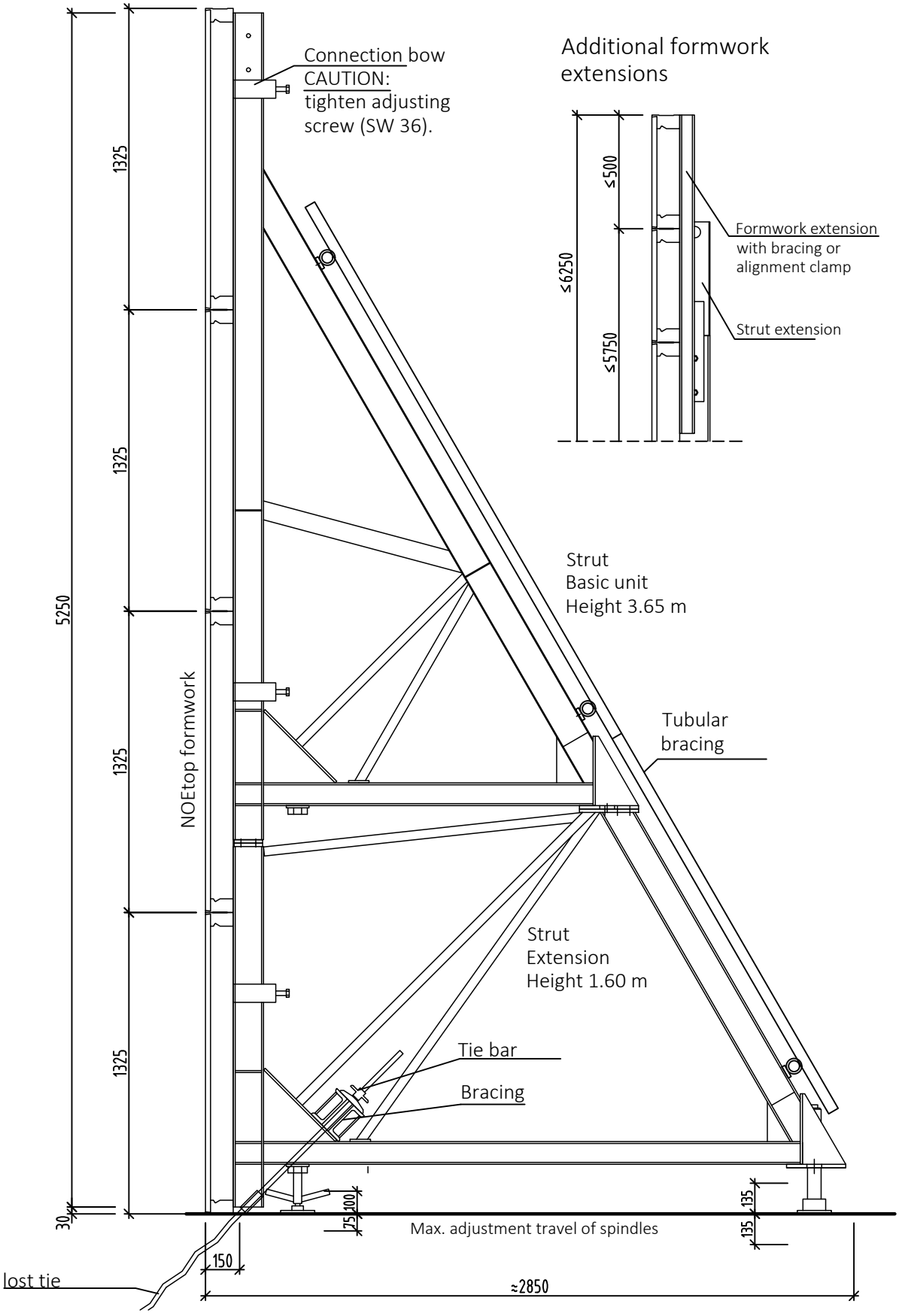
Height 5.40 - 5.80 m with extension 500 mm

Height 6.00 - 6.20 m with extension, top panel max. 500 mm high with alignment clamp extended (see section).

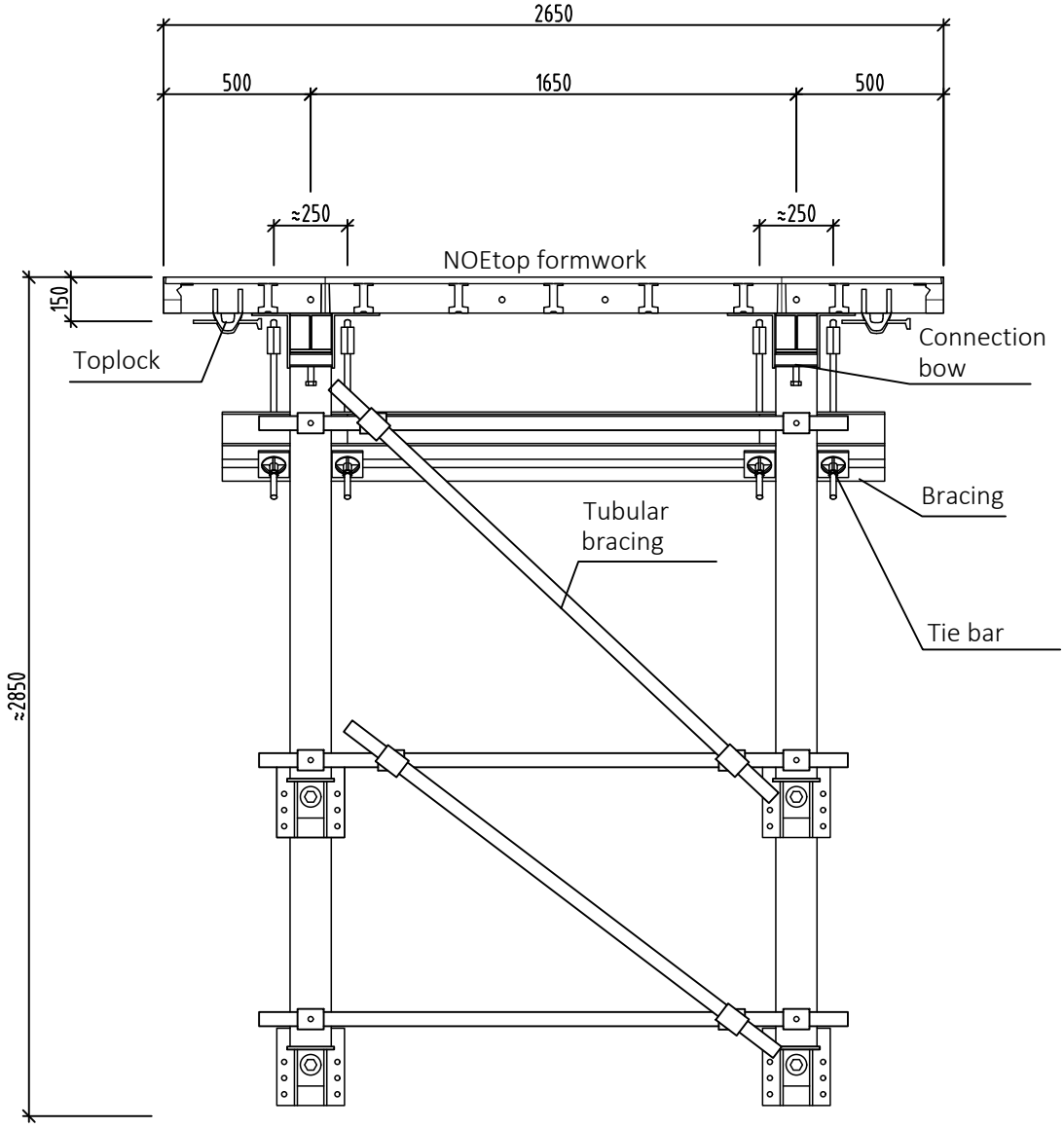
We recommend inclining the strut forward by 2/3 of the calculated deformation f.

Values for fastening withØ26 mm on request.

4.3 Section through base unit with extension

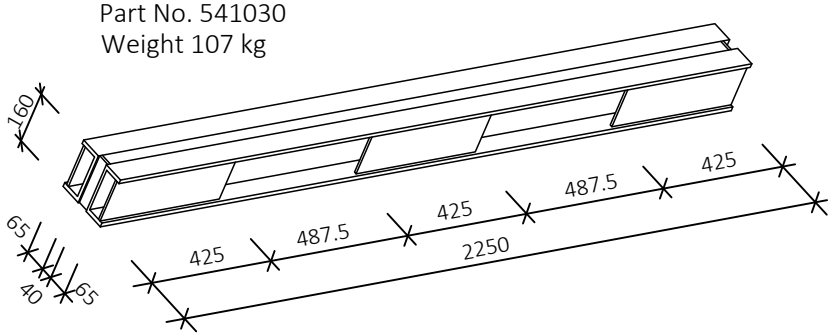


4.4 Plan view of base unit and extension



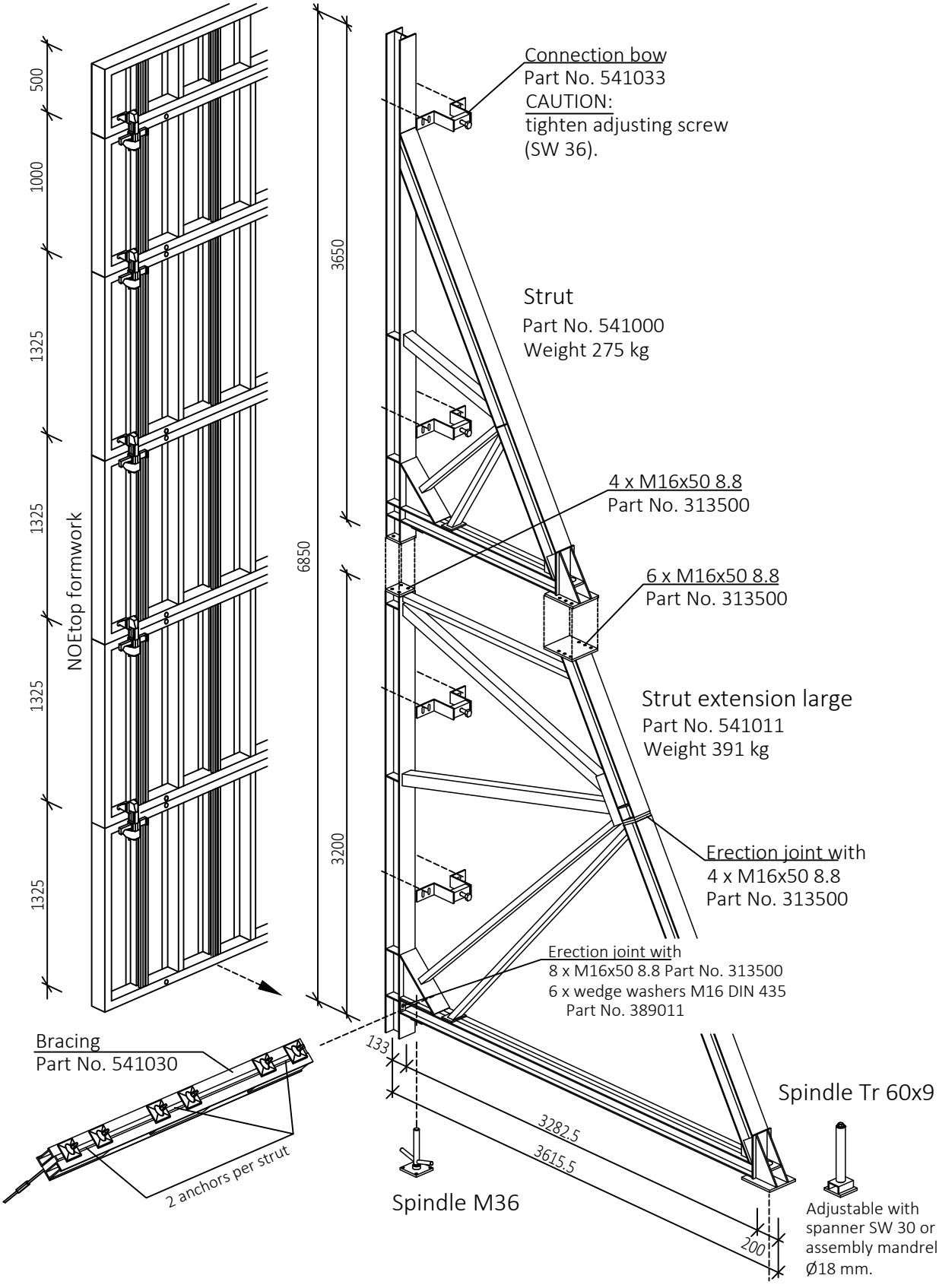
Bracing

Part No. 541030
Weight 107 kg



5 Strut base unit with large extension

5.1 Height 6.85 m or 7.35 m (with extensions)



5.2 Formwork height with extensions up to 7.85 m

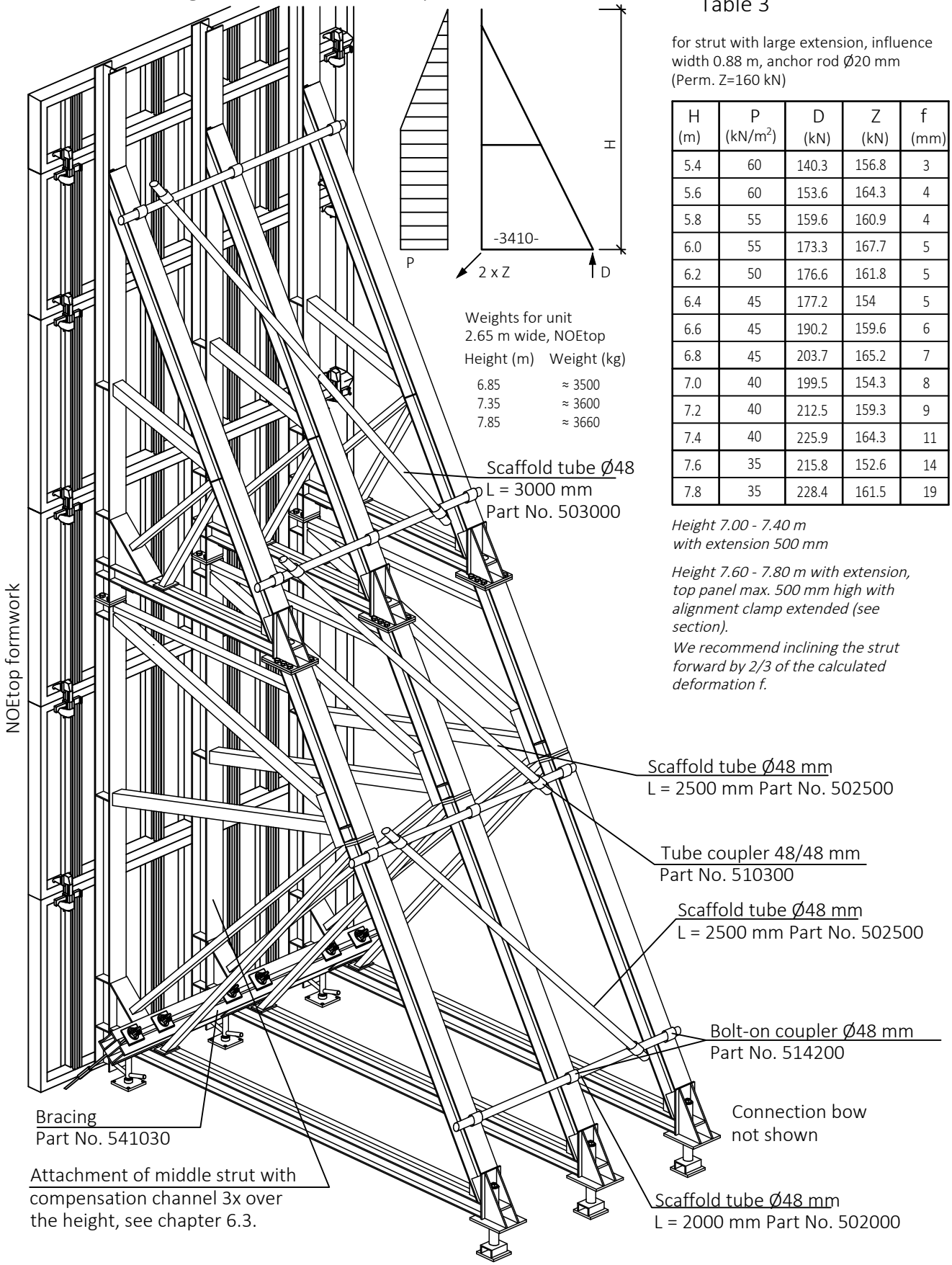


Table 3

for strut with large extension, influence width 0.88 m, anchor rod Ø20 mm (Perm. Z=160 kN)

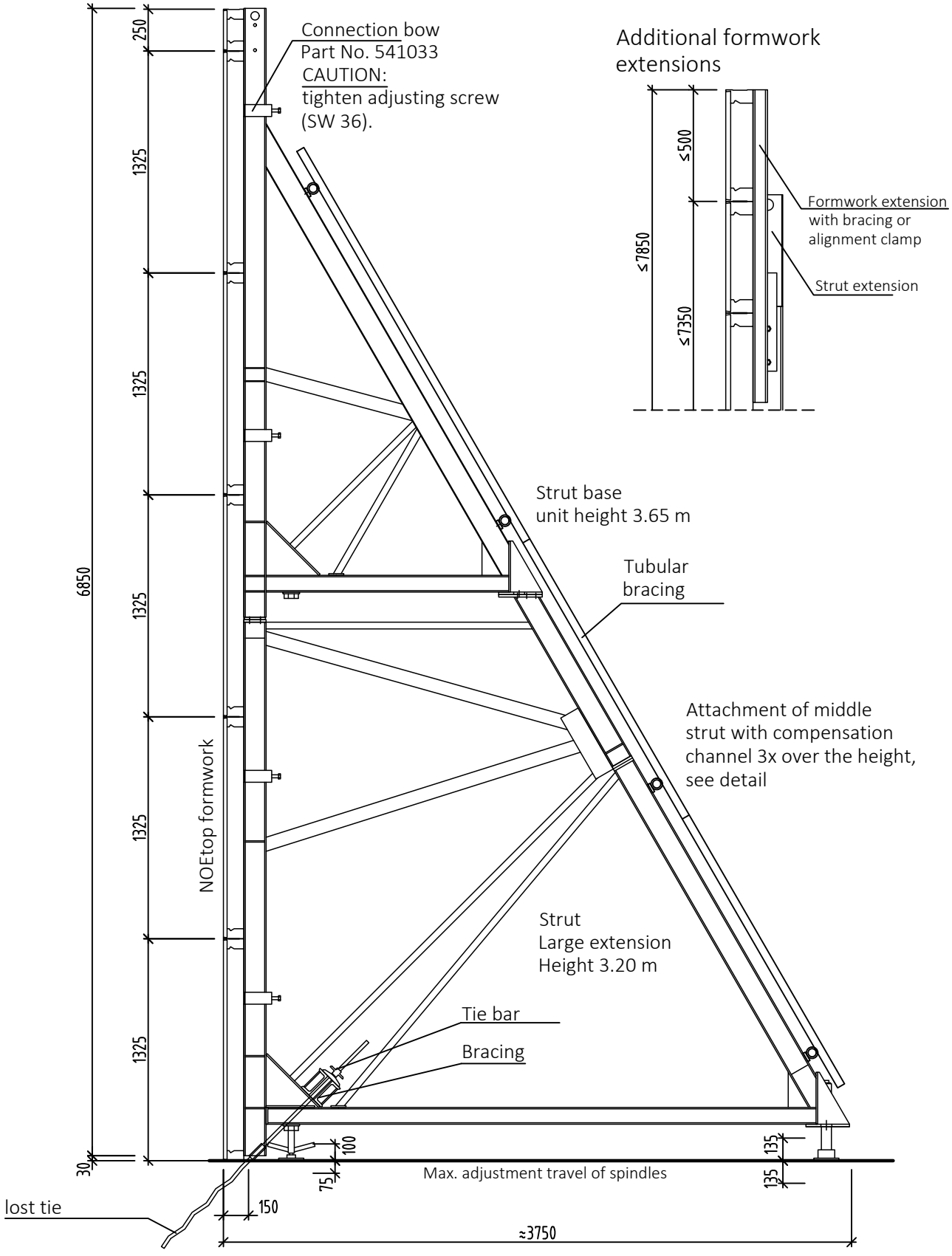
H (m)	P (kN/m²)	D (kN)	Z (kN)	f (mm)
5.4	60	140.3	156.8	3
5.6	60	153.6	164.3	4
5.8	55	159.6	160.9	4
6.0	55	173.3	167.7	5
6.2	50	176.6	161.8	5
6.4	45	177.2	154	5
6.6	45	190.2	159.6	6
6.8	45	203.7	165.2	7
7.0	40	199.5	154.3	8
7.2	40	212.5	159.3	9
7.4	40	225.9	164.3	11
7.6	35	215.8	152.6	14
7.8	35	228.4	161.5	19

Height 7.00 - 7.40 m with extension 500 mm

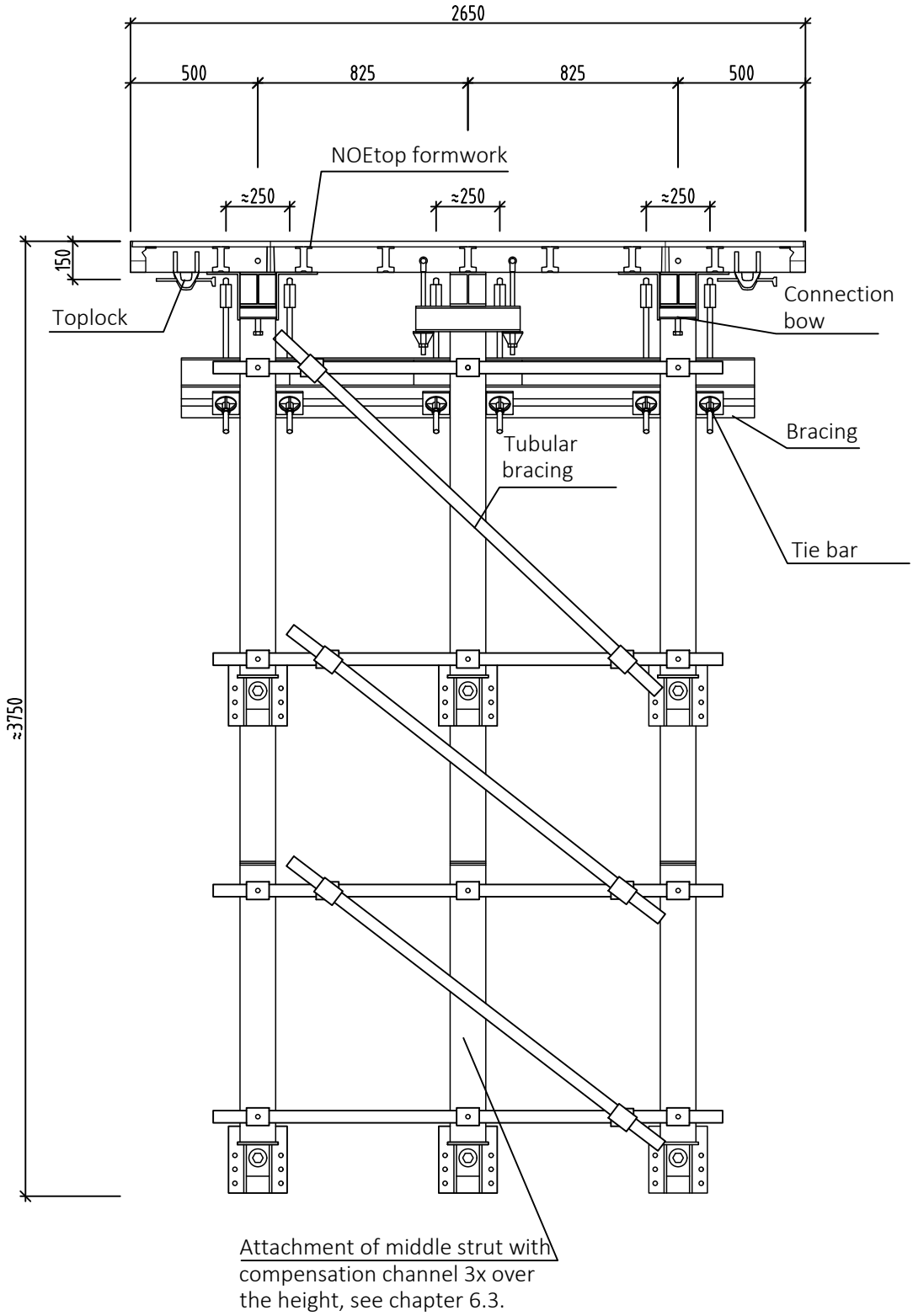
Height 7.60 - 7.80 m with extension, top panel max. 500 mm high with alignment clamp extended (see section).

We recommend inclining the strut forward by 2/3 of the calculated deformation f.

5.3 Section through base unit with large extension



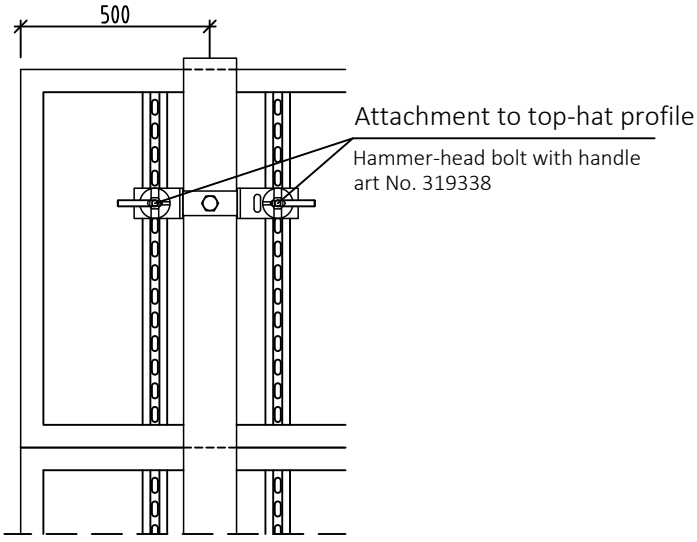
5.4. Plan view of base unit with large extension



6 Attachment of struts

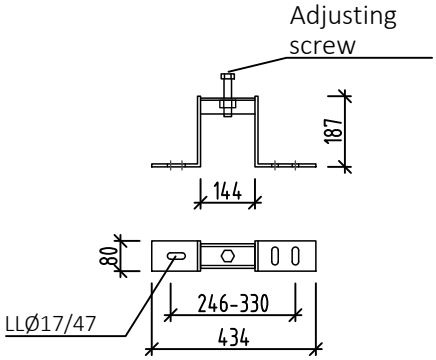
6.1 With connection bow to NOEtop panels

NOEtop panel horizontal



Connection bow

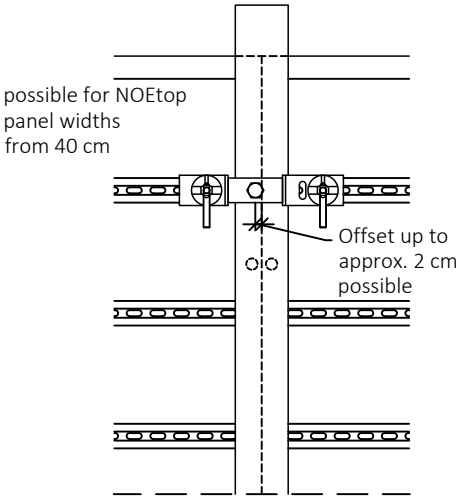
Part No. 541033
Weight 3.8 kg



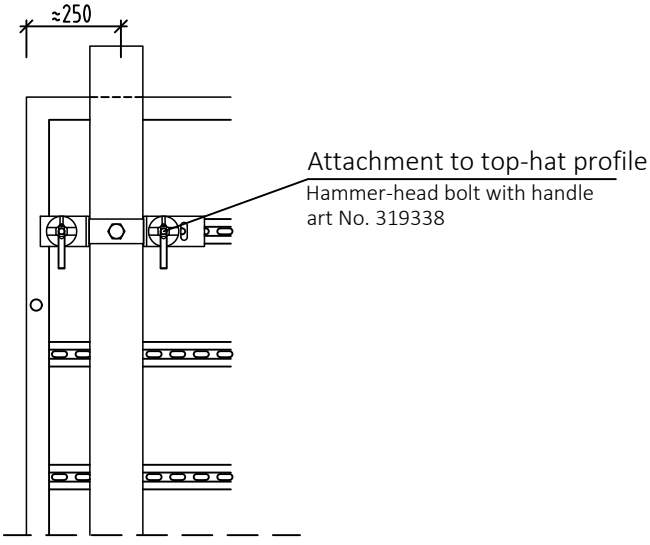
After attaching bow tighten adjusting screw(SW 36). Load capacity of each connecting bow max. 2 kN (200 kg).

NOEtop panel vertical

Attachment at panel butt joint



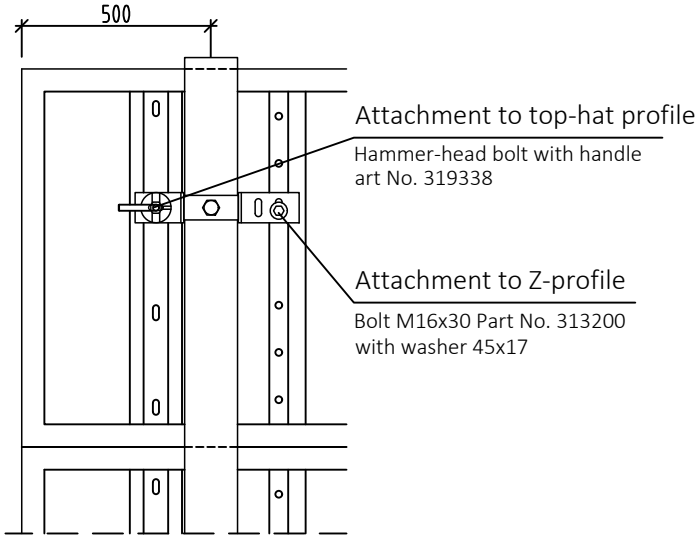
Attachment to panel



For transport, the crane suspension point must be attached to the strut, not to the formwork.

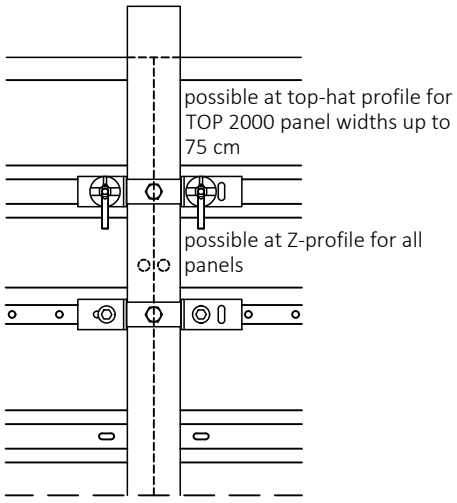
6.2 With connection bow to TOP 2000 panels

TOP 2000 panel horizontal

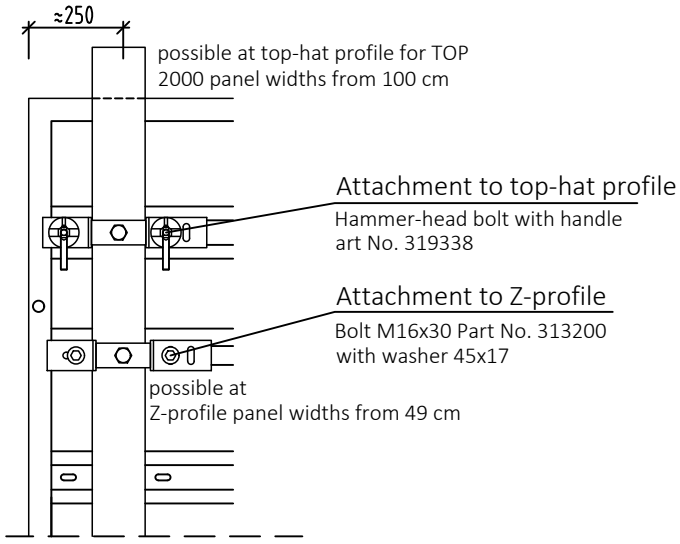


TOP 2000 panel vertical

Attachment at panel butt joint



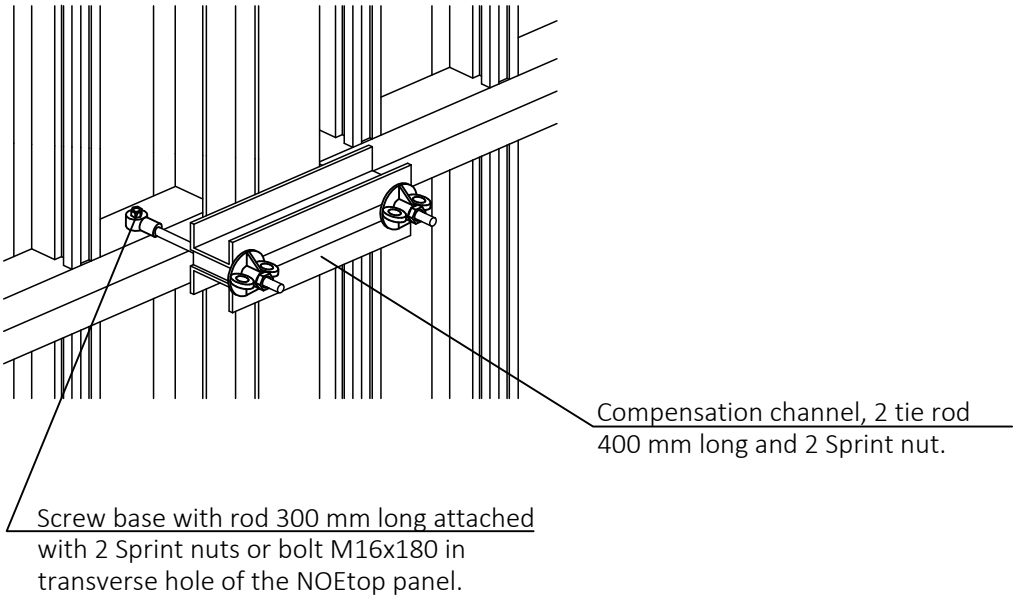
Attachment to panel



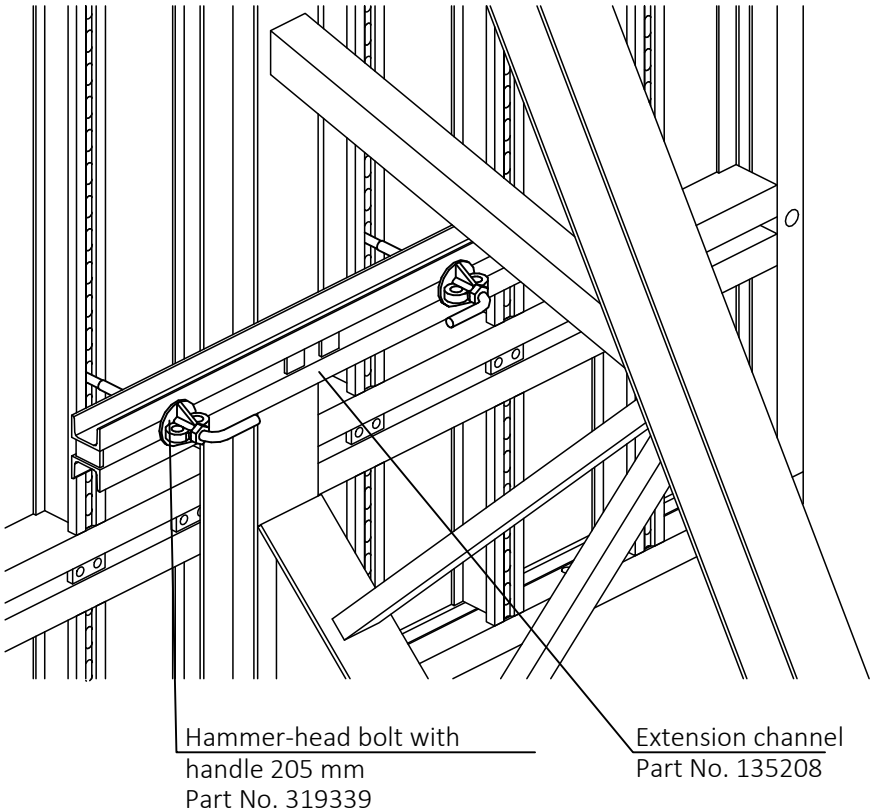
For transport, the crane suspension point must be attached to the strut, not to the formwork.

6.3 Attachment of middle strut

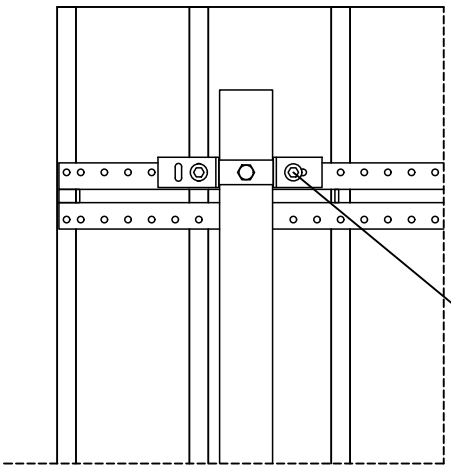
NOEtop panel horizontal, attached at transverse hole



NOEtop GF panel fastened at the hat profile



6.4 With connection bow to formwork with NOE C20 steel bracing

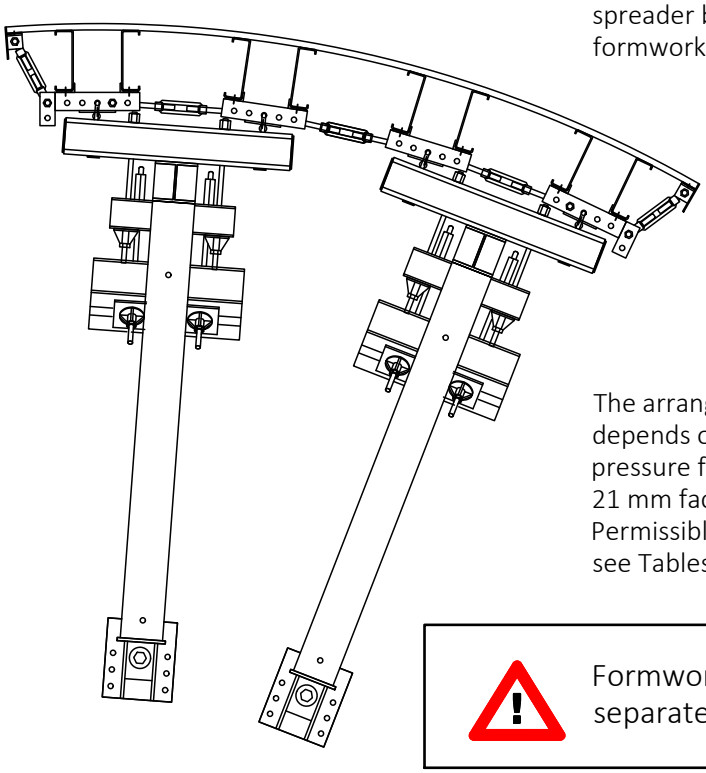


Spacing of struts according to separate structural calculations of the wall formwork.
Permissible concrete pressure from tables for NOEtop formwork; the actual influence width for the struts must be taken into account.

Bolt M16x30
Part No. 313200
with washer 45x17

6.5 To NOE C20 circular formwork

Attach compensation channel Part No. 135109 with two 50 cm tie bars and Sprint nut and hexagonal nut to the spreader bar of the C20 circular formwork.

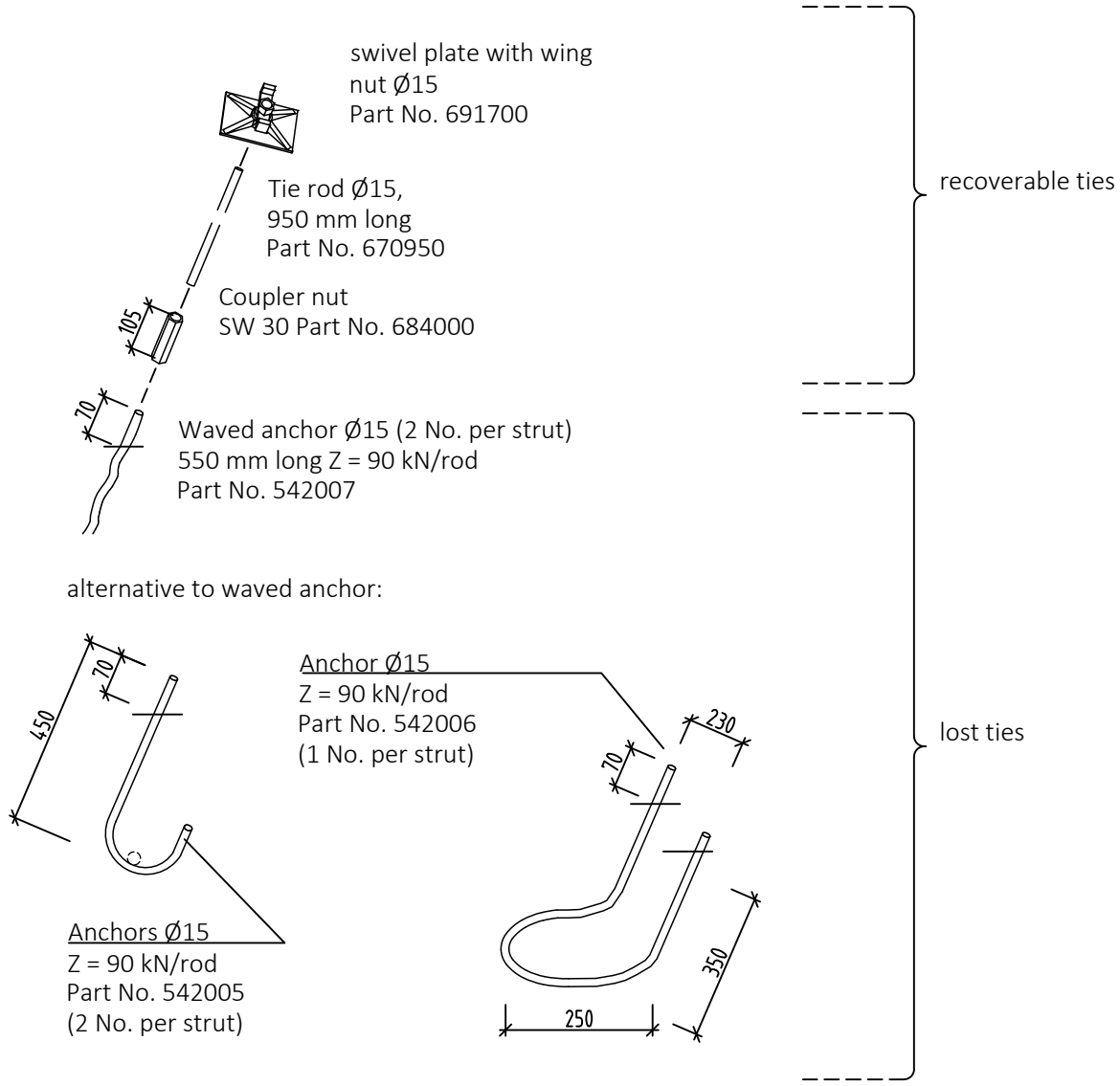


The arrangement of the struts and anchor rods depends on the radius. Permissible concrete pressure for circular formwork: 50 kN/m^2 with 21 mm facing, 40 kN/m^2 with 15 mm facing. Permissible concrete pressure for struts see Tables 1 - 3.

Formwork and struts must be moved separately !

7 Parts for fastening

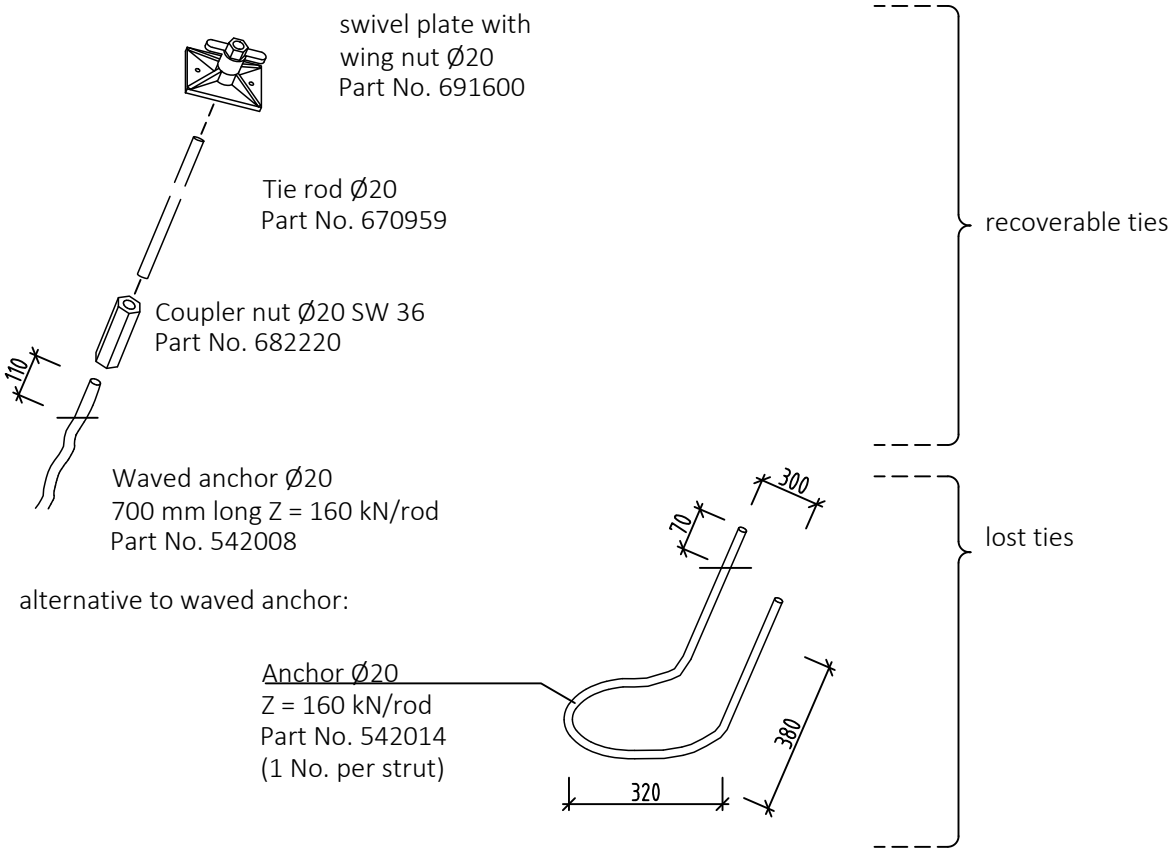
7.1 Anchor rod diameter 15 mm



Instead of the waved anchor, a tie rod ungalvanized (Part No. 76....) with lost Sprint nut can be used. Permissible tension force 90 kN/rod.

For transport, the crane suspension point must be attached to the strut, not to the formwork.

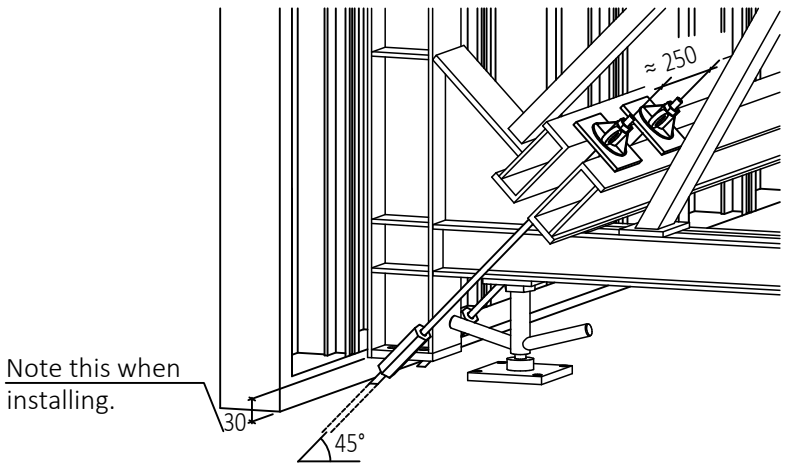
7.2 Anchor rod diameter 20 mm



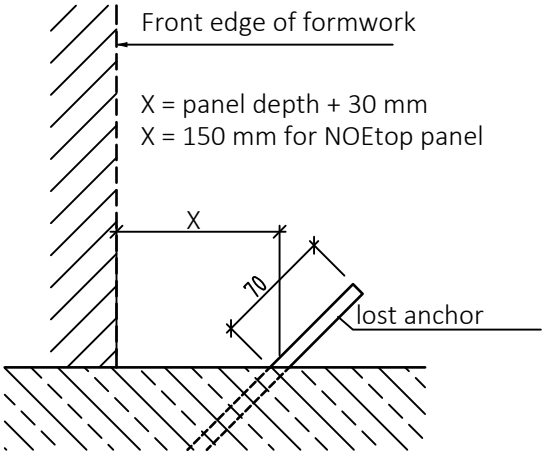
Instead of the waved anchor, a tie rod d=20 mm (Part No. 67...9) with lost turnbuckle body can be used.

> For transport, the crane suspension point must be attached to the strut, not to the formwork.

Fastening detail

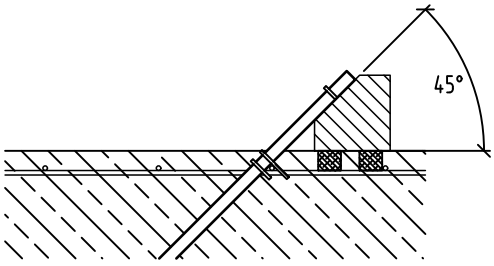


7.3 Anchor installation with projecting anchor rods



Conventional with timber

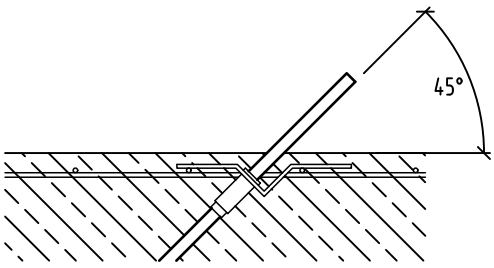
Lay bevelled or notched timber with markings for the position of the anchor rods on spacers. Tie anchor rod to top and bottom reinforcement and fix to timber.



with anchor fastener

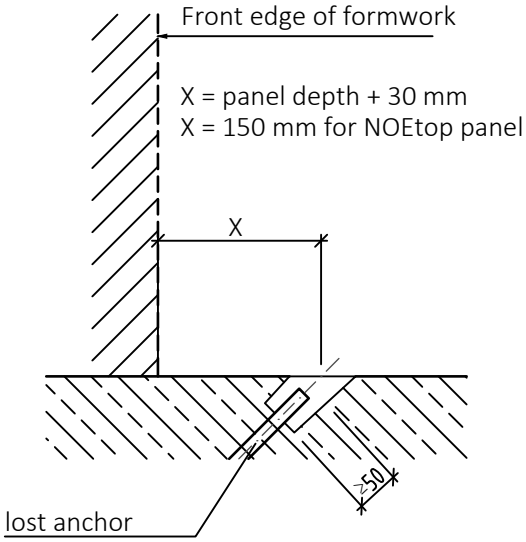
Push or screw anchor rod into fastener and tie to the upper reinforcement.

Anchor fasteners on request



For tying, screw coupler nut onto the embedded tie rod. Make sure that the coupler nut is screwed onto the tie rod until it meets the stop. After setting the strut, screw the recoverable anchor rod fully into the coupler nut until it meets the stop, and tension with the turnbuckle against the strut bracing.

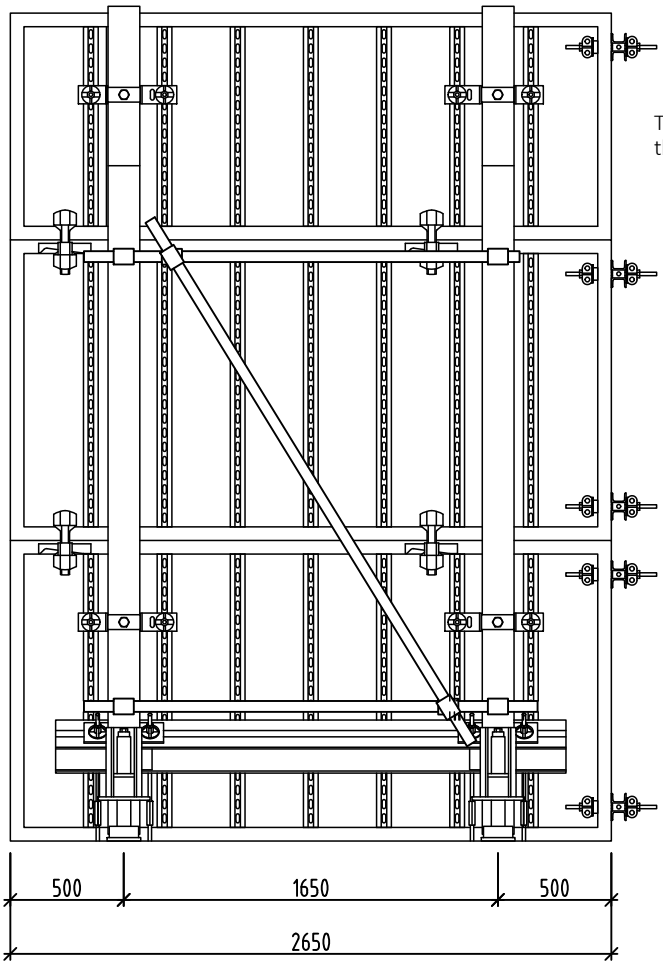
7.4 Anchor installation with recessed anchor rods



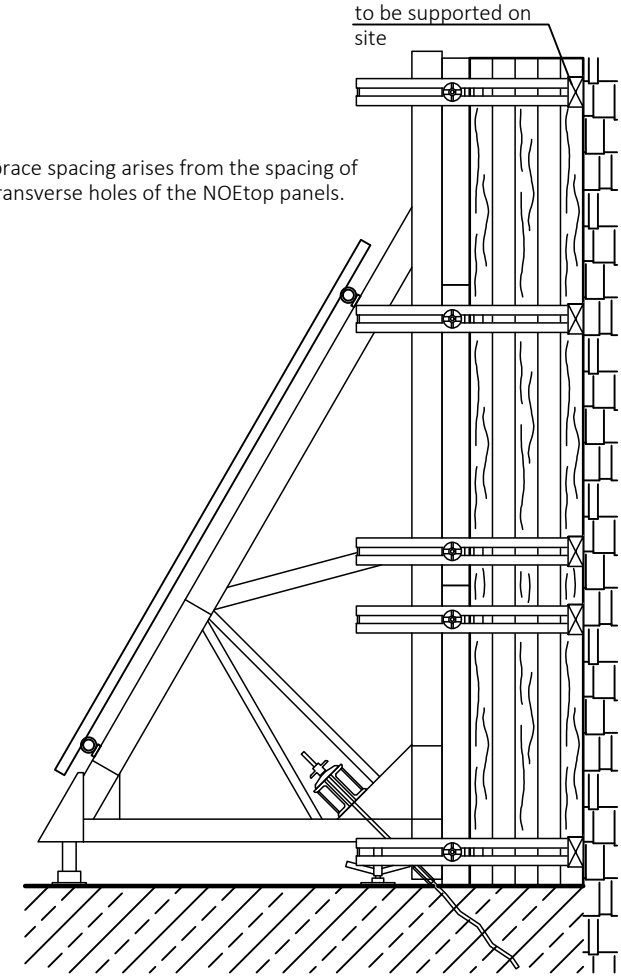
The anchor rod must project at least 50 mm out of the concrete so as to be able to fully unscrew the coupler nut.

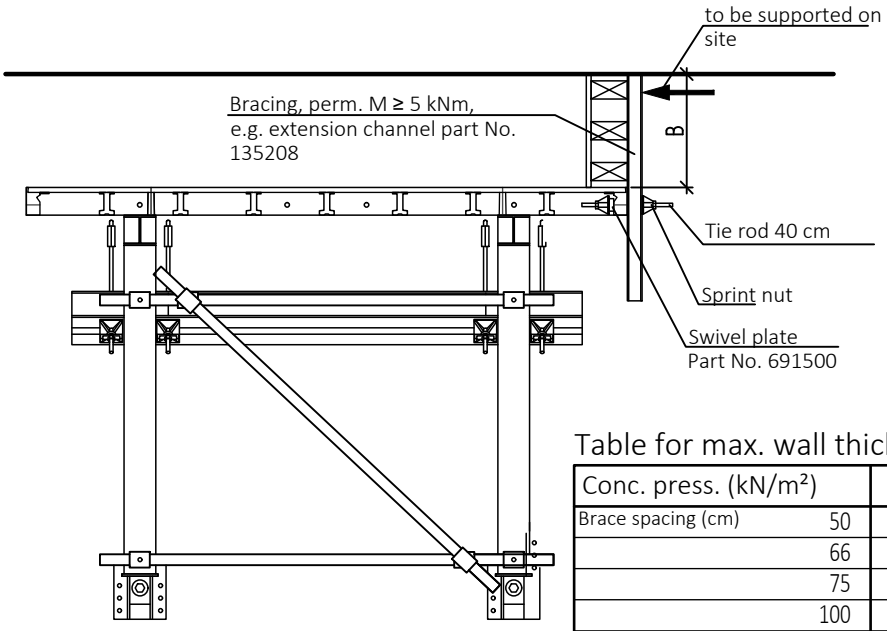
8 Use of panels

8.1 Stop-end formwork with NOEtop panels



The brace spacing arises from the spacing of the transverse holes of the NOEtop panels.





Brace spacing without using the transverse holes

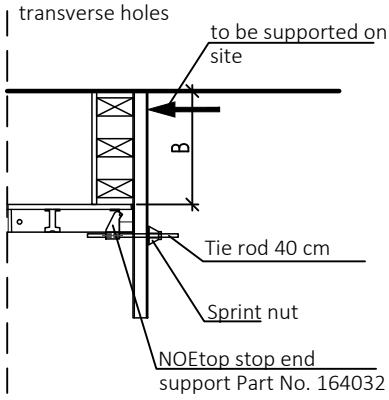
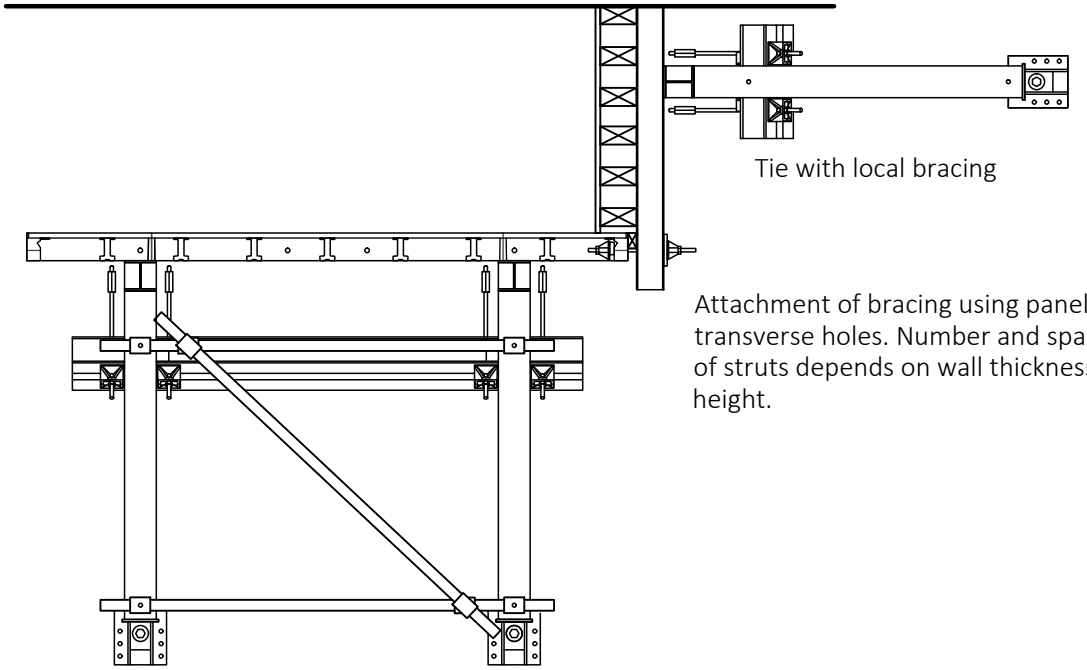


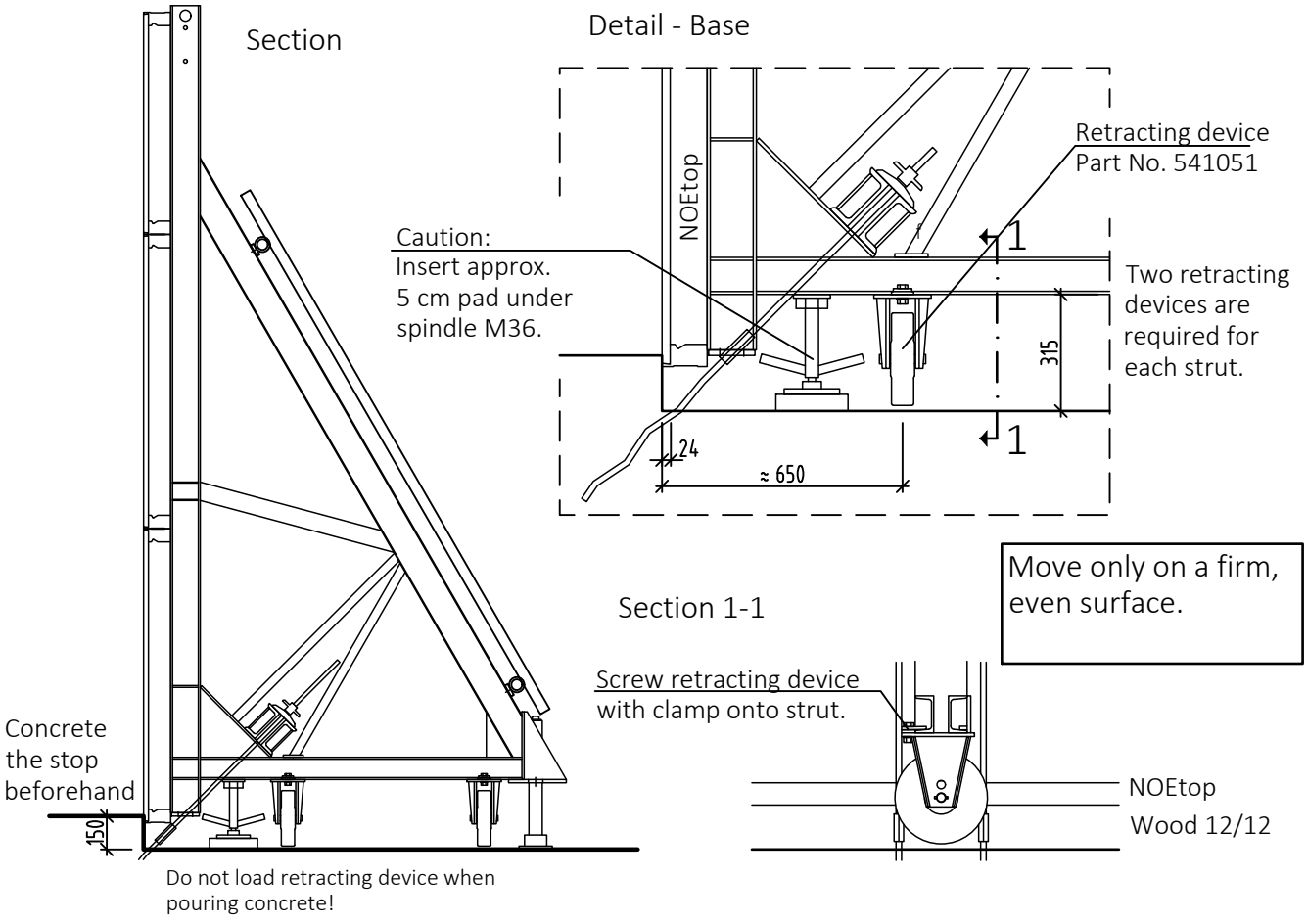
Table for max. wall thickness B (in cm)

Conc. press. (kN/m²)		30	35	40	45	50	55	60
Brace spacing (cm)	50	126	107	92	81	72	65	59
	66	93	79	68	60	53	47	43
	75	81	68	59	52	46	41	37
	100	59	49	42	37	32	29	26
	133	42	35	30	26	22	20	17

8.2 Stop-end formwork with strut for large wall thicknesses

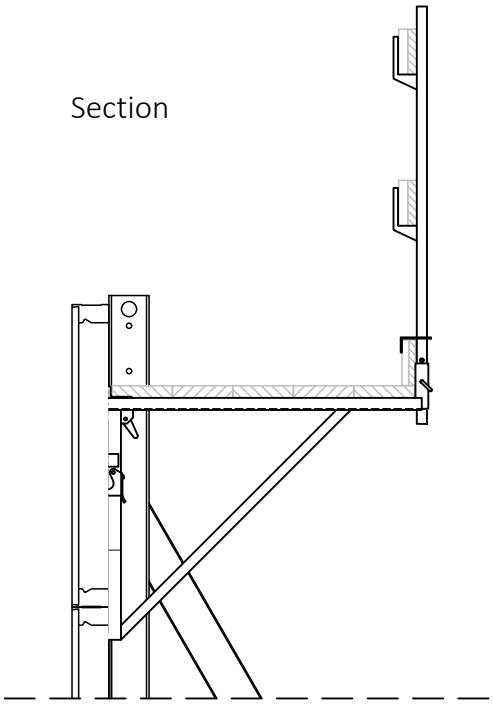


8.3 Retraction device for struts



8.4 Working scaffold

Section

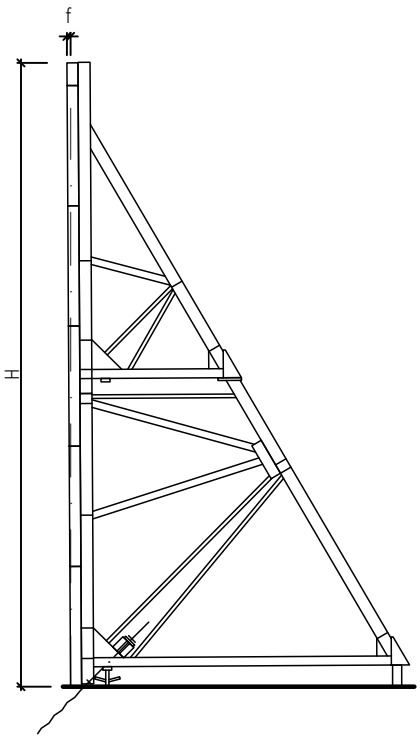


Walkway brackets must be attached directly to formwork. Otherwise use separate working platform (possibly mobile). Observe safety regulations!

8.5 Alignment dimensions for struts

When using the embedded anchor rod, there will be a change in length depending on the loading as a result of the strain and slip of the rod.
In the case of large wall heights the strut must therefore be ''inclined forwards'' an amount f.

Refer to the relevant loading tables for recommended values.



THE FORMWORK

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