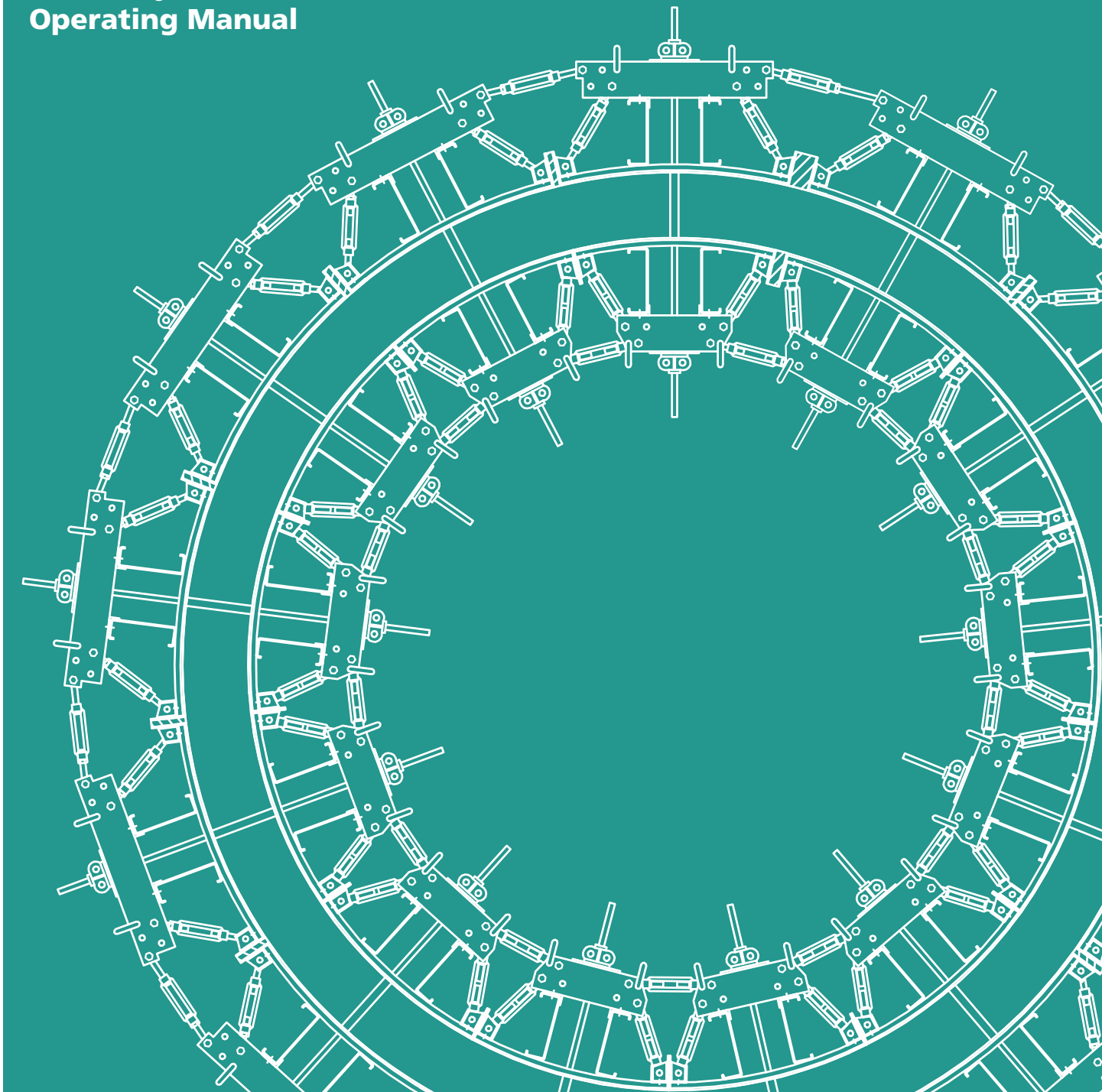
THE FORMWORK

NOE® R110

Dated: 01.2021

Assembly and Operating Manual



Contents

1. Safety advice, GSV guidelines

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.
- Safety symbols: 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).

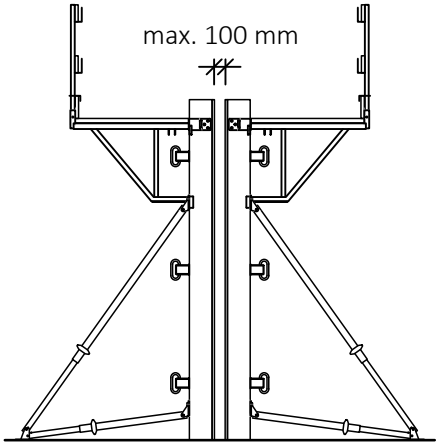
Visual check: The intended operation is to be subject to a visual check.

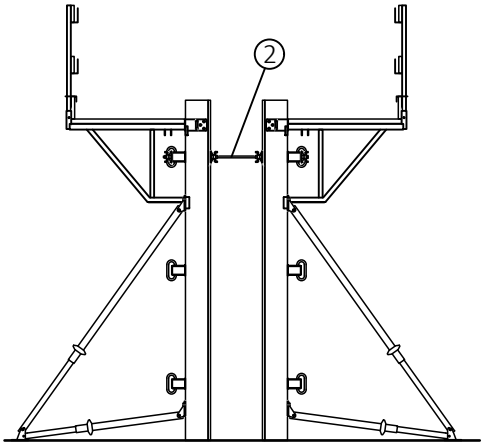
Note: Supplementary information for safe, correct and professional execution of work activities.

- 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.

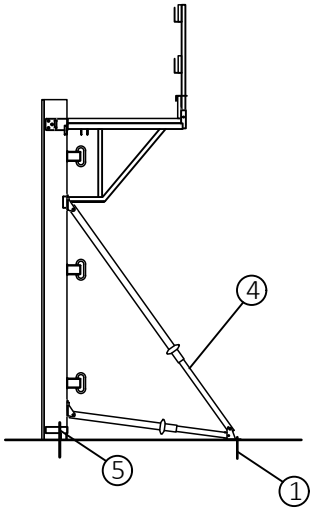
Safe setting down of formwork elements

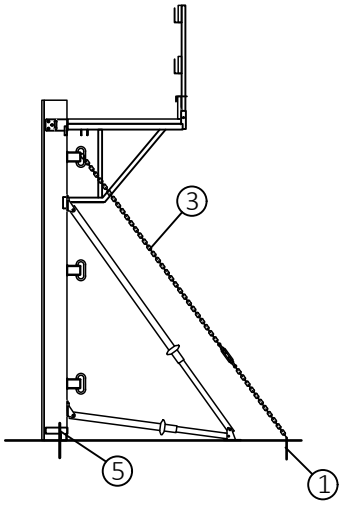
Double-faced formwork system





Single-faced formwork system





To avoid accidents always set elements down in such a way that they are structurally stable (guy, brace, anchor), this includes placing them down safely on the ground.

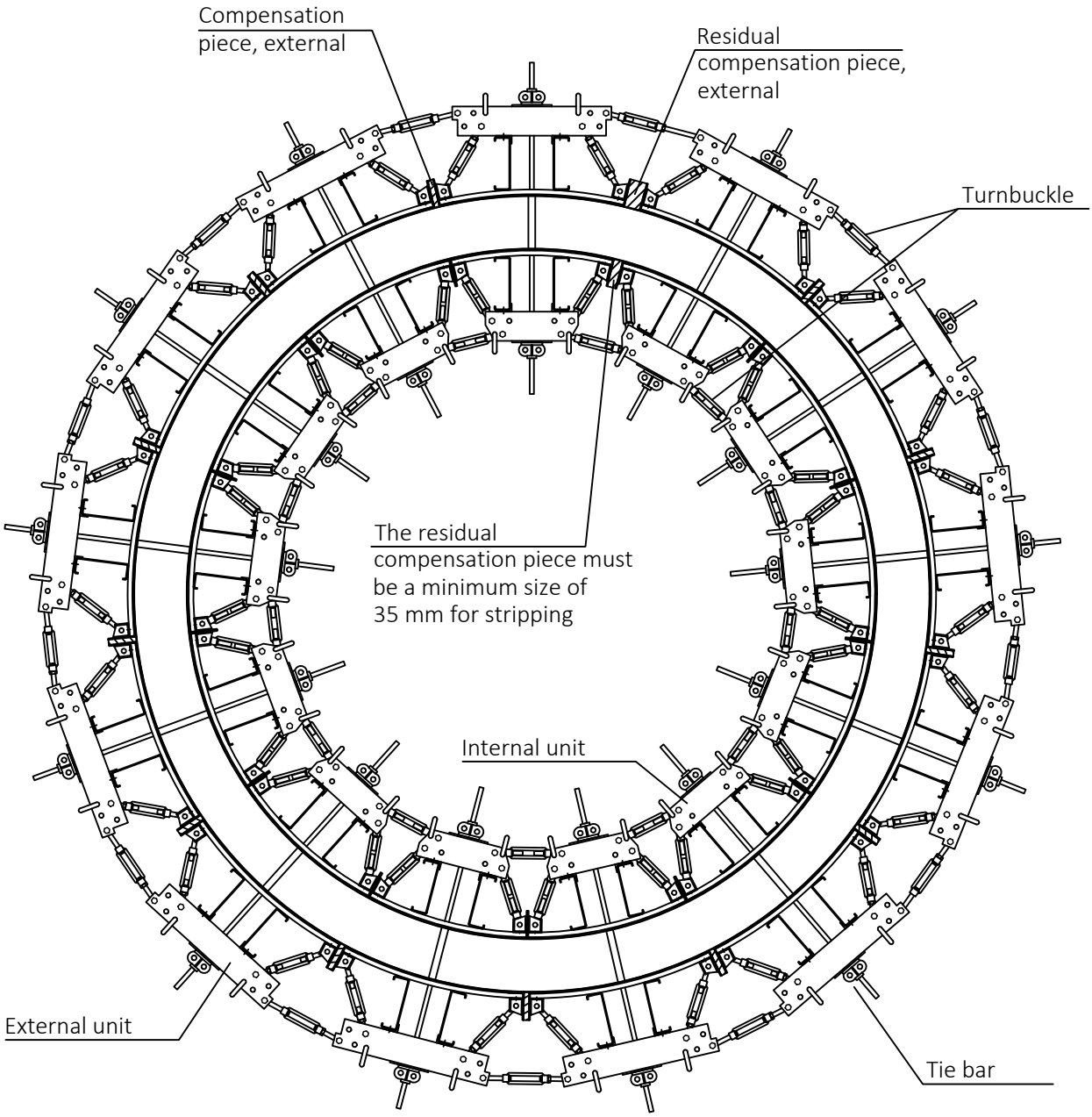
If the stabilizers are anchored with an anchor bolt, they must be able to act in compression and tension. At least 2 stabilizers must be attached to single elements.
Attach the uplift safety device in the event of wind loads.

1 Anchor bolt
2 Tie rod
(to resist tension and compression)
3 Guy
4 Stabilizer, anchored
5 Uplift safety device

2. System overview NOE R110 circular formwork

Example of full circle with internal radius = 1300 mm, wall thickness 200 mm

➔ *Only NOE special release agent must be used to oil the shutters !*



Connection fastenings, stabilizers and scaffolds are omitted from this drawing.

Permissible concrete pressure in acc. with DIN 18218: 50 kN/m²
Minimum radius 1.10 m, max. radius 2.50 m

3. Sections and details

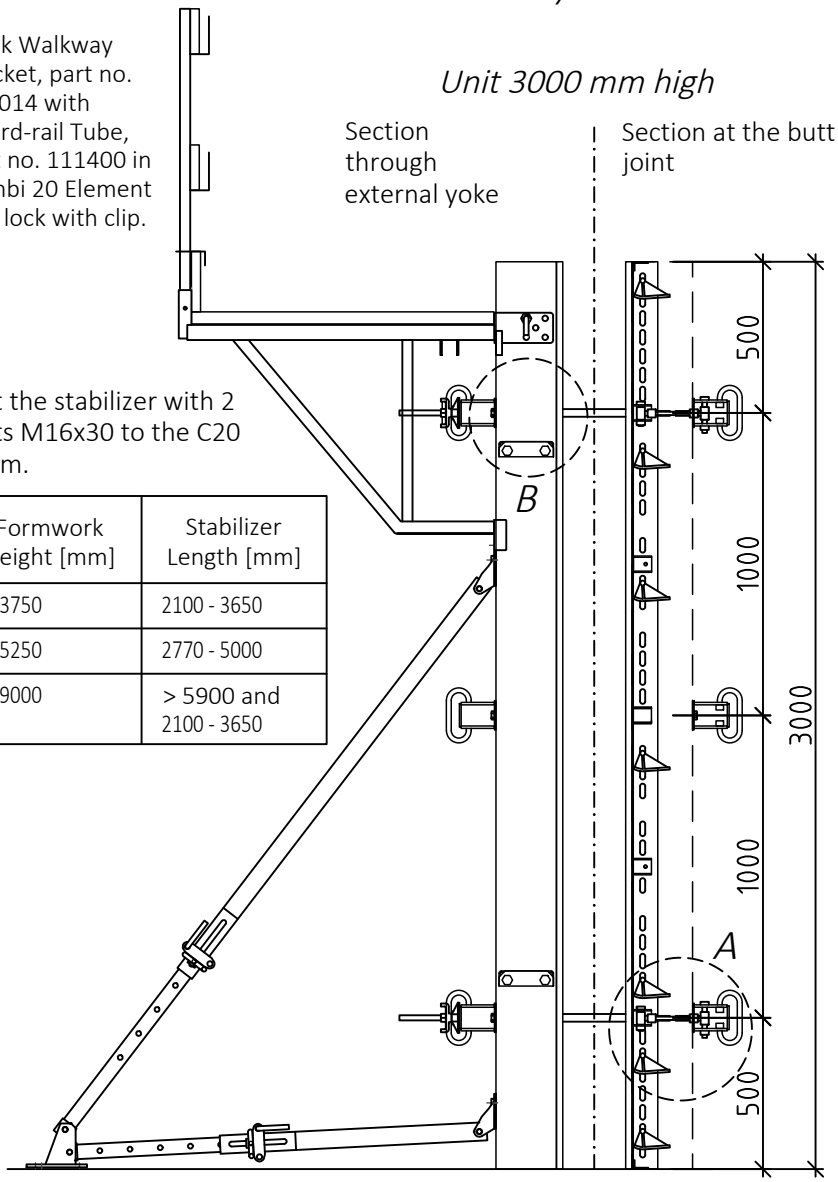
3.1 Sections with stabilizer and walkway bracket

Hook Walkway Bracket, part no. 530014 with Guard-rail Tube, part no. 111400 in Combi 20 Element and lock with clip.

Unit 3000 mm high

Section through external yoke

Section at the butt joint

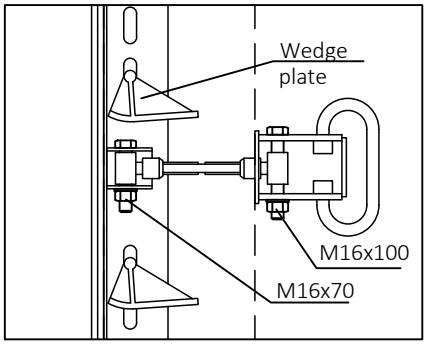


Bolt the stabilizer with 2 bolts M16x30 to the C20 beam.

Formwork height [mm]	Stabilizer Length [mm]
≤ 3750	2100 - 3650
≤ 5250	2770 - 5000
≤ 9000	> 5900 and 2100 - 3650

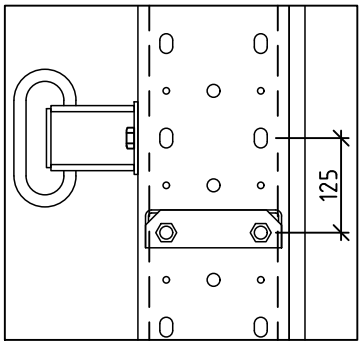
Anchor stabilizers to resist tension and compression forces

Detail A



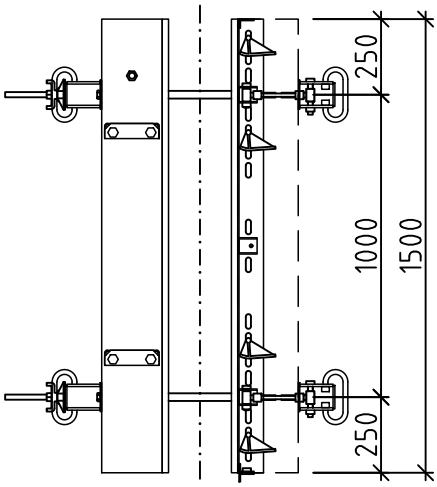
Yokes bolted to the C20 beam at the level of the connection angle tab. Connection of channel near shackle.

Detail B



Stiffener 125 mm bolted in place with 4 bolts M16x30 above and/or below the yokes.

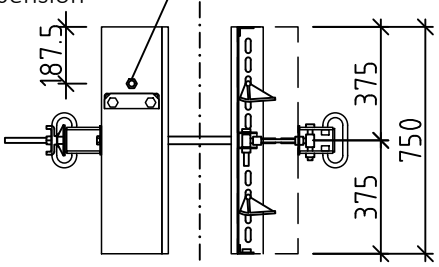
Extension unit 1500 mm



Extension unit 750 mm

Crane suspension

Ring bolt with eye for crane suspension attached to each unit

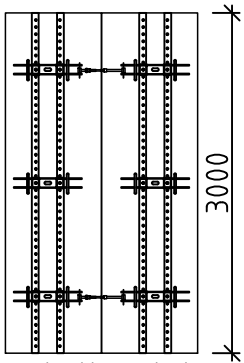


3.2 Unit connections

Wedge plate or wedge lock		Turnbuckles	
Unit height	Amount	Unit height	Amount
3000 mm	7 pcs.	3000 mm	2 pcs.
1500 mm	4 pcs	1500 mm	2 pcs.
750 mm	2 pcs.	750 mm	1 pcs.

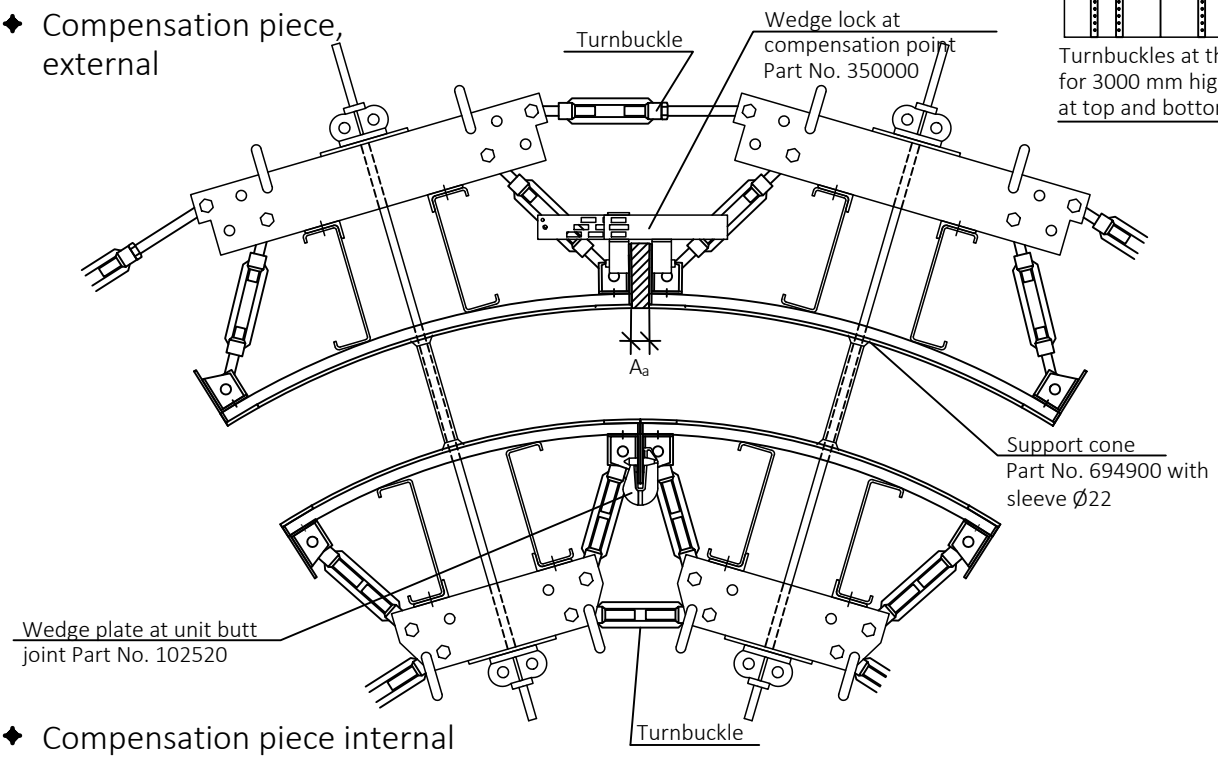
Direct connection with wedge plate. Connection at compensation point with wedge lock or with tie rod and 2 hexagonal nuts (up to 12 cm).

Elevation unit 3000 mm

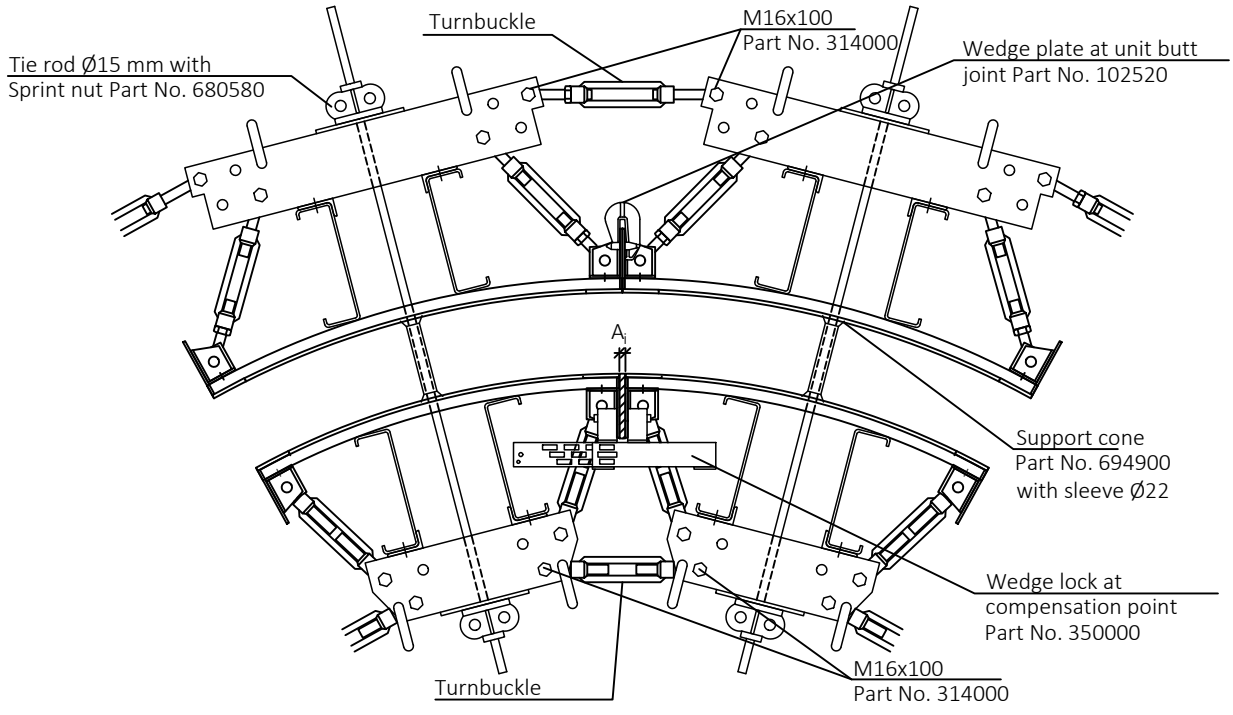


Turnbuckles at the butt joint for 3000 mm high units only at top and bottom yokes.

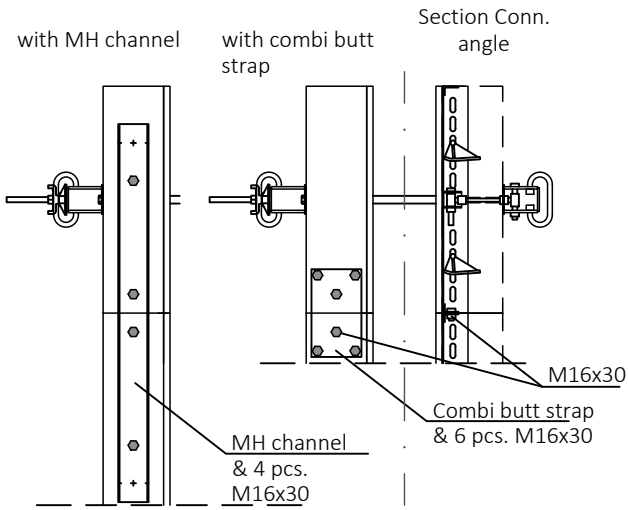
- Compensation piece, external



- Compensation piece internal



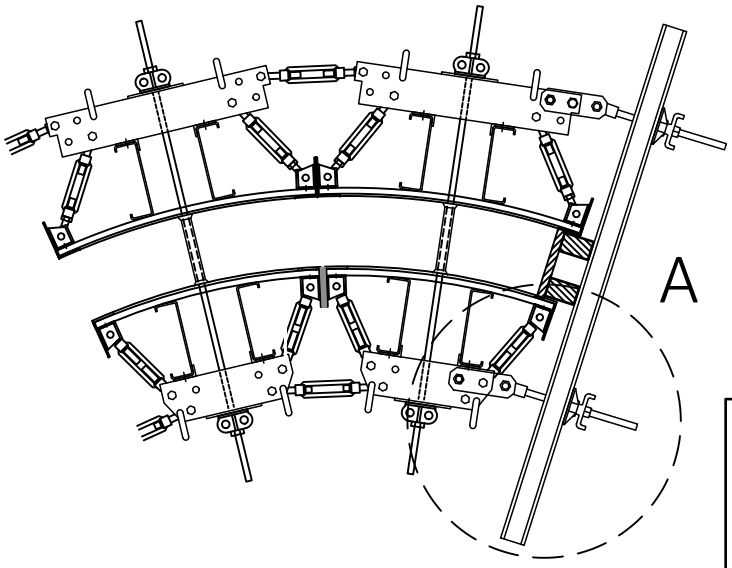
3.3 Extensions



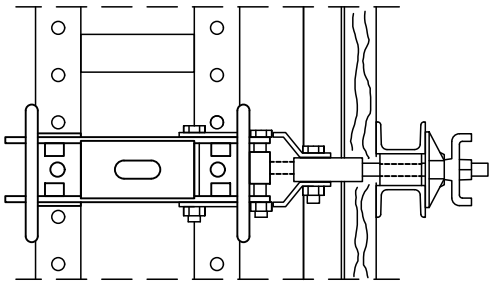
For extensions of all units, bolt combi butt strap and MH channel alternately to each C20 beam. Bolt the connection angles together with bolts M16/30.

Each unit extension requires:
1 Combi butt strap Part No. 352200
1 MH channel 1.25 m Part No. 261250
12 Bolts M16x30 Part No. 313200

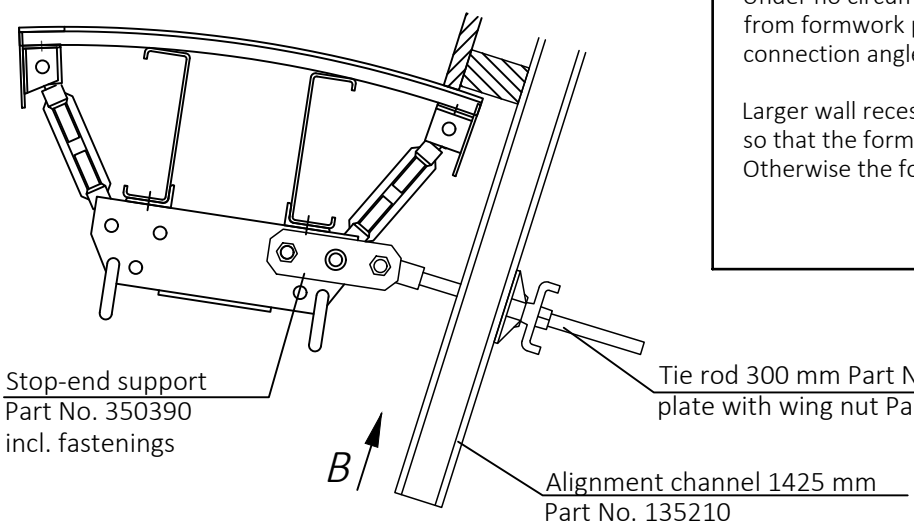
3.4 Stop-end form



View B



Detail A



Attention:

If the stop-end is installed without stop-end supports, then the force due to the pressure on the stop-end must be carried completely on stabilizers.

Under no circumstances must the forces arising from formwork pressure be carried by the connection angles !

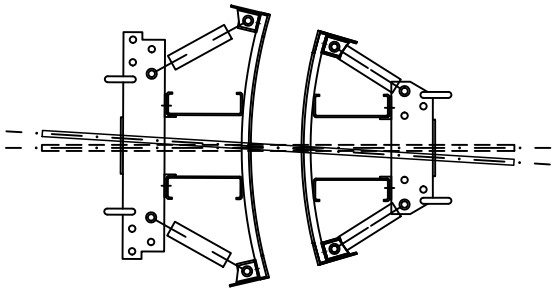
Larger wall recesses must be adequately stiffened so that the formwork can push against them. Otherwise the formwork facing might deform.

3.5. Tie bars

Tying is by tie bars Ø15 mm and swivel plate with wing nut (Part No. 691700) or Sprint nut (Part No. 680580).
The tie rods should be installed at right angles to the unit.

Permissible skew of the tie rods Ø15 mm

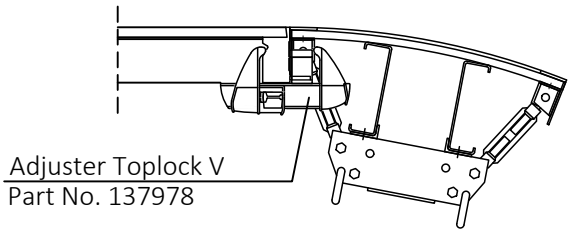
- for 150 mm wall thickness max. 2.5°
- for 200 mm wall thickness max. 2.0°
- for 250 mm wall thickness max. 1.5°
- for 300 mm wall thickness max. 1.0°



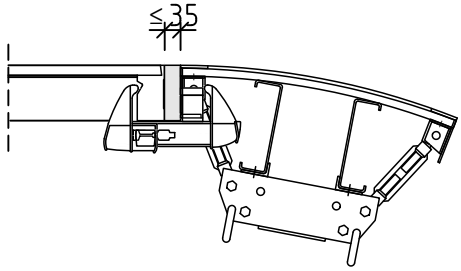
3.6 Connection with NOEtop frame formwork or NOEtop R275 circular formwork

✦ *To an NOEtop panel*

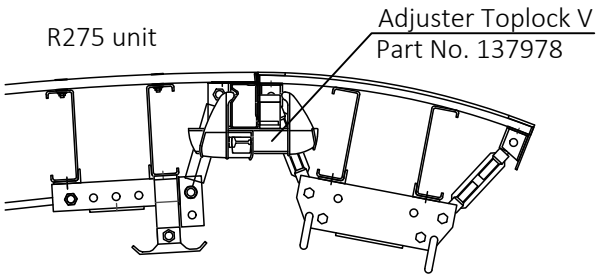
Connection with adjuster Toplock V



Compensation up to 35 mm possible



✦ *To NOEtop R275 circular formwork*



Unit height	Amount
3000 mm	6 pcs.
1500 mm	3 pcs.
750 mm	2 pcs.

4. Erecting the formwork units

Depending on the site programme requirements, erection can start with either the internal or the external units.

1. Place the first unit in the intended position.
2. Before releasing the crane bow, attach 2 stabilizers and anchor them.
3. Place the next unit down and connect at the edge profile with wedge plates or, if a compensation piece is to be used, install the piece of wood and connect there with wedge locks.
4. Before releasing the crane bow, attach a stabilizer and anchor it.
5. Adjust the alignment of the unit and attach a turnbuckle at the butt joint.
6. Place further elements down and align them in the same way.
7. Attach walkway brackets and lay the scaffold planking.
8. Erect the opposing formwork and guide the tie rods through the elongated holes and orientate the rods to be at right angles to the units.

When erecting the opposing formwork units, make sure that the units are positioned relative to their central axis, in other words the unit ends are in certain circumstances offset to one another (half the compensation piece size).

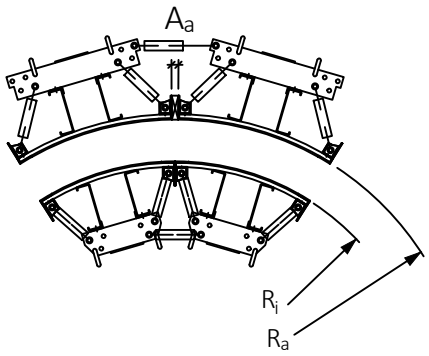
5. Range of application

External unit L_a = 0.711 m
Internal unit L_i = 0.617 m

Facing thickness
B = 2 x 9 mm + 6 mm NOEplast
Radii: min. R = 1.10 m
max. R = 2.50 m

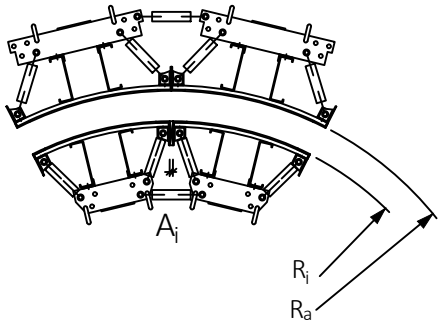
Permis. conc. pressure to DIN 18218: 50 kN/m²

Compensation piece, external



Radii = concrete dimension

Compensation piece internal



For a detailed view of the butt joint between units see 3.2 Unit connections.

The relationship between the internal and external radii determines whether an internal or external compensation piece, or no compensation piece at all, is required. The compensation value S, which depends on the internal radius, must be calculated in order to determine the position of the compensation piece (internal or external):

$S = (1.15 \times R_i - 18\ mm)$ R_i in mm

The following cases are possible:

a) No compensation piece

Condition: $S = R_a$

b) Compensation piece, internal

Condition: S greater than R_a

Calculation: $$A_i = R_i \times \left(\frac{L_a}{R_a + 18} - \frac{L_i}{R_i - 18} \right)$$

c) Compensation piece, external

Condition: S less than R_a, but A_a less than 120 mm.

Calculation: $$A_a = R_a \times \left(\frac{L_i}{R_i - 18} - \frac{L_a}{R_a + 18} \right)$$

Example:

R_i = 1500 mm R_a = 1750 mm

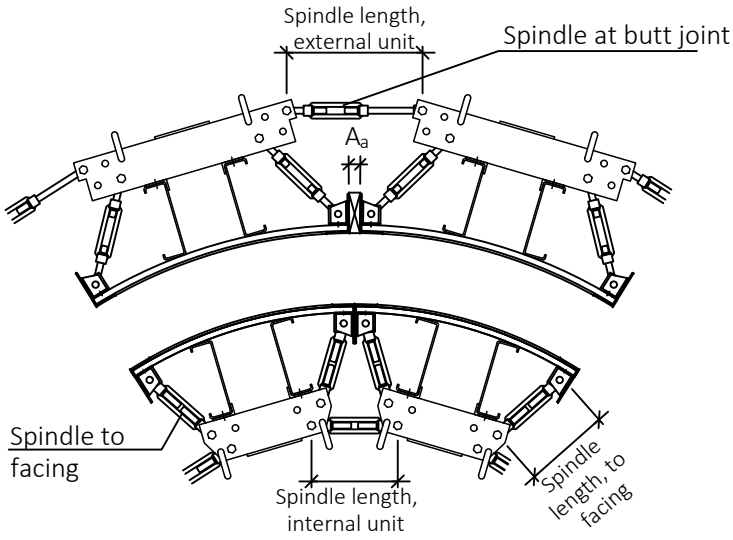
Compensation value $S = (1.15 \times 1500 - 18) = 1707$ mm

S is less than R_a → $$A_a = 1750 \times \left(\frac{617}{1500 - 18} - \frac{711}{1750 + 18} \right)$$

A_a = 25 mm is less than 120 mm.

6. Setting the radius

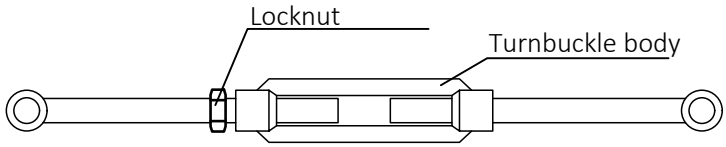
The units are set to the radius for their first use at the factory and then delivered. Wooden gauges can be used on site to set the subsequent radii accurately. Setting the radius is done by turning the turnbuckle body to alter the curvature of the units.



Wooden gauge
Internal formwork Part No. 352222
External formwork Part No. 352223
(Please inform us of the radius at the time of ordering, gauges can be supplied as purchased items.)

For the internal formwork units, unscrew the spindle attached to the facing by approx. 1 1/2 turns (approx. 2 mm) to allow for the change from tension to compression loading in the spindle.

Adjusting the turnbuckle



Adjust the turnbuckle by turning the turnbuckle body. Tighten the locknuts after adjusting the turnbuckle.

7. Individual parts

7.1 Units

External units

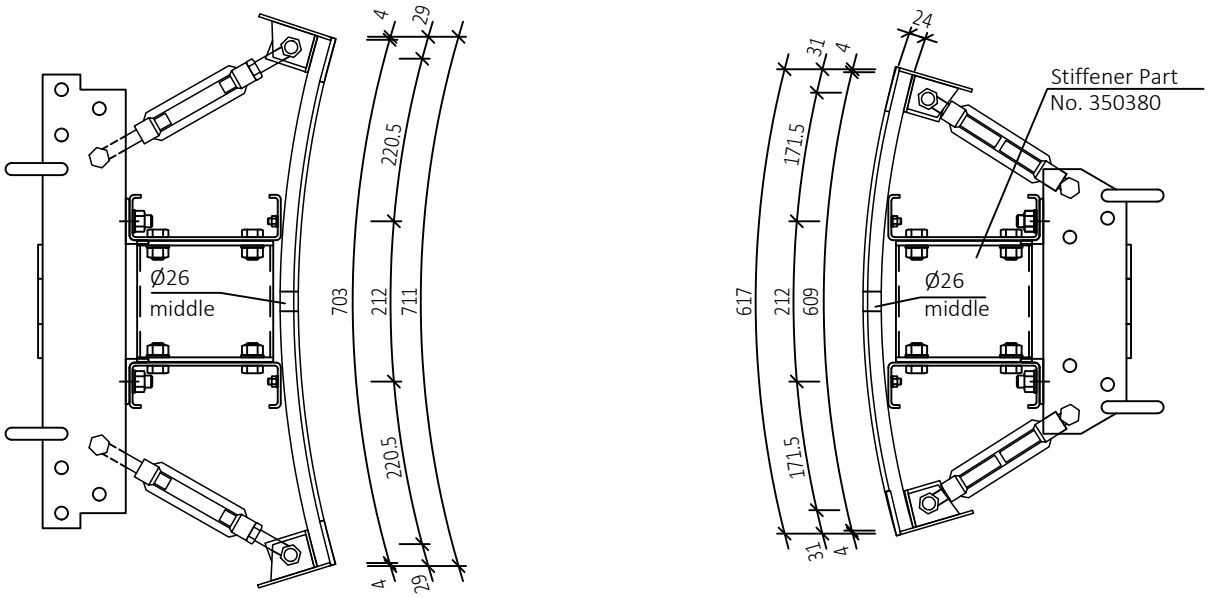
Height [mm]	Part No.	Weight [kg]
3000	440301	192
1500	440302	109
750	440303	55

Internal unit

Height [mm]	Part No.	Weight [kg]
3000	440307	182
1500	440308	98
750	440309	49

➔ *Please note:*
Only NOE special release agent must be used to oil the shutters !

Facing 2x9mm NOEform and 6 mm NOEplast coated



1 crane suspension (ring bolt, safety nut) is attached to each unit.

Loose parts for the connection of units and turnbuckles for the coupling of units are not included with the standard unit. Neither are extension accessories, walkway brackets, stabilizers and tying devices.

7.2 NOE special release oil

Part No. 569710	200	Litre
Part No. 569720	30	Litre
Part No. 569730	5	Litre

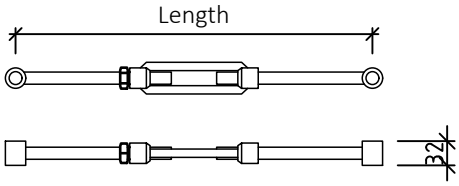
7.3 Connection fastenings and turnbuckles

Turnbuckles

Desig-nation	Length [mm] min - max	Part No.	Weight (kg)
long	412-530	350310	0.8
middle	312-430	350315	0.7
short	212-330	350320	0.6

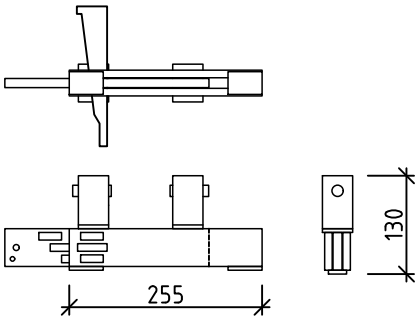
Each turnbuckle requires 2 No. M16x100 Part No. 314000.

Right/left thread M20



Wedge lock

Part No. 350000
Weight 4.3 kg

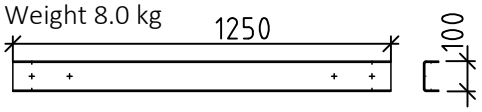


Wedge plate

Part No. 102520
Weight 0.63 kg

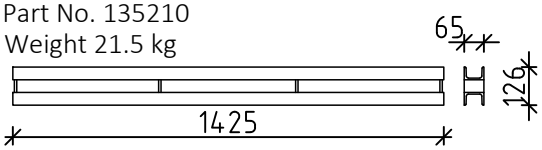
MH channel 1250 mm

Part No. 261250
Weight 8.0 kg



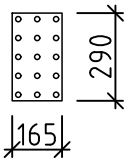
Alignment channel 1425 mm

Part No. 135210
Weight 21.5 kg



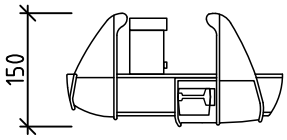
Combi butt strap

Part No. 352200
Weight 2.2 kg



Adapter NOE Toplock V

Connection with NOEtop R275 formwork
Part No. 137978
Weight 4.4 kg



Tie rod 300 mm long

Part No. 670300
Weight 0.42 kg

Swivel plate with wing nut

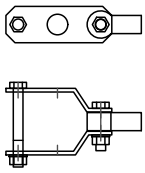
Part No. 691700
Weight 1.2 kg

Hexagonal nut (size 30)

Part No. 680900
Weight 0.13 kg

Stop-end support

Part No. 350390
Weight 1.91 kg



M16x30

Part No. 313200
Weight 0.11 kg

M16x100

Part No. 314000
Weight 0.22 kg

7.4 Connection angles, yokes and stiffeners

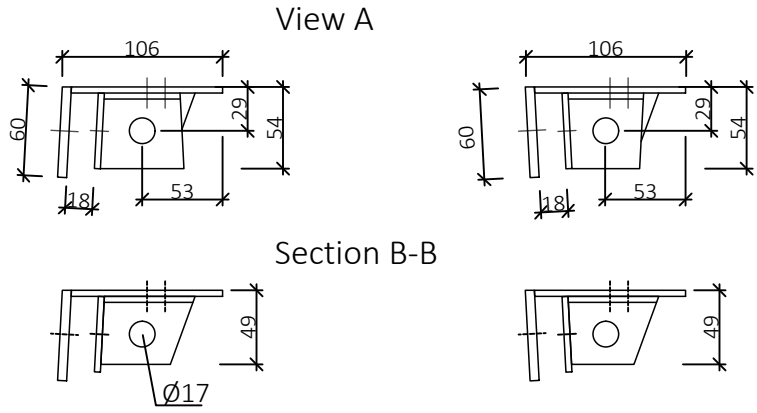
Connection angles

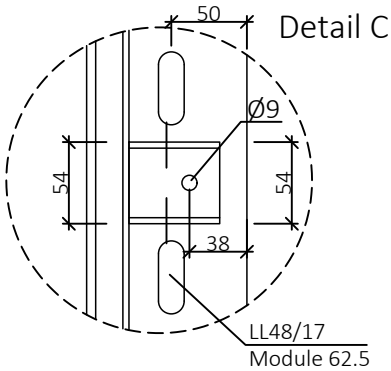
External formwork units

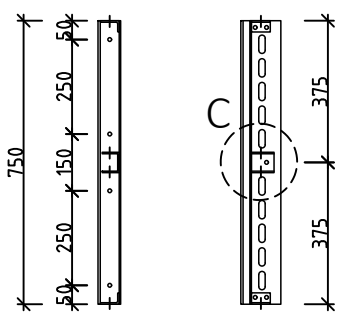
Length [mm]	Part No.	Weight (kg)
3000	350365	24.3
1500	350366	12.5
750	350367	6.4

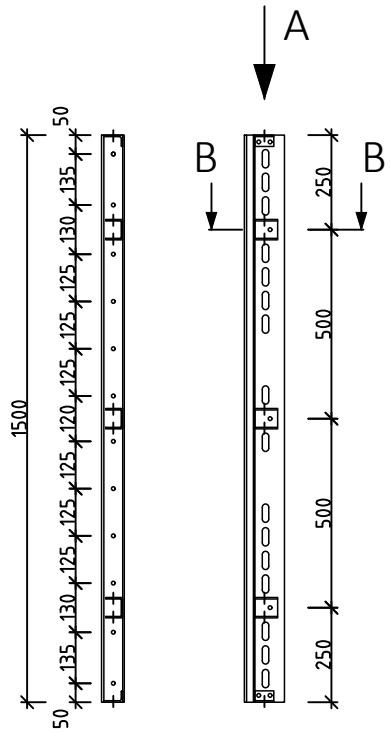
Internal formwork units

Length [mm]	Part No.	Weight (kg)
3000	350362	24.3
1500	350363	12.5
750	350364	6.4

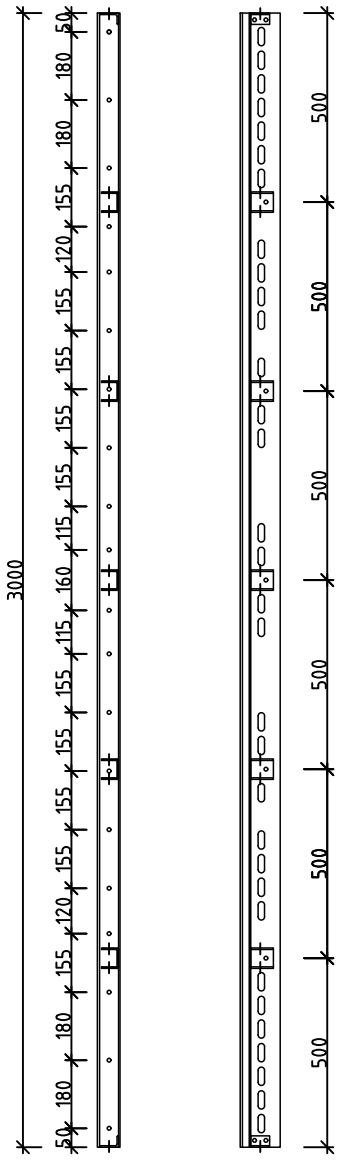






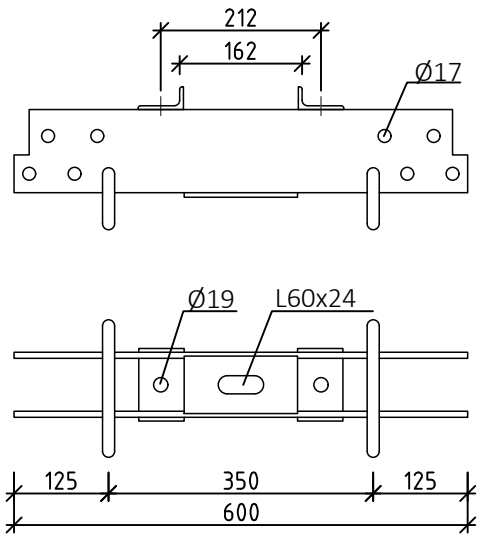


Dimensions apply to internal and external channels



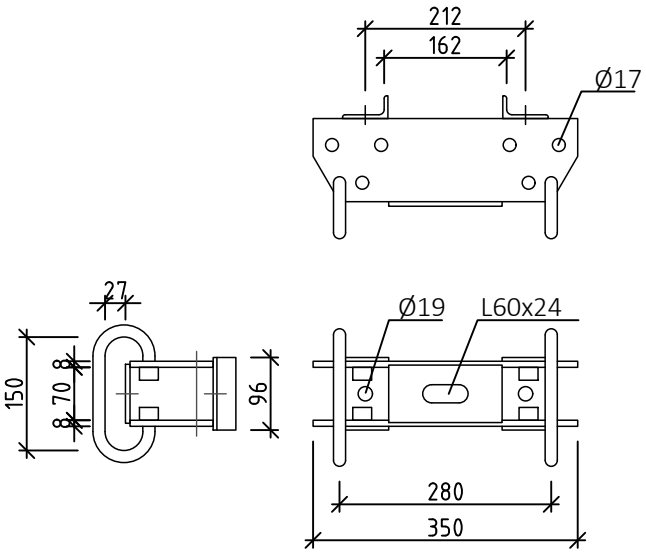
Yoke for external formwork

Part No. 350298
Weight 10.2 kg



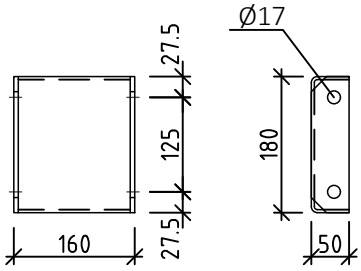
Yoke for internal formwork

Part No. 350297
Weight 6.8 kg



Stiffener for C20 beam

Part No. 350380
Weight 2.4 kg



THE FORMWORK

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