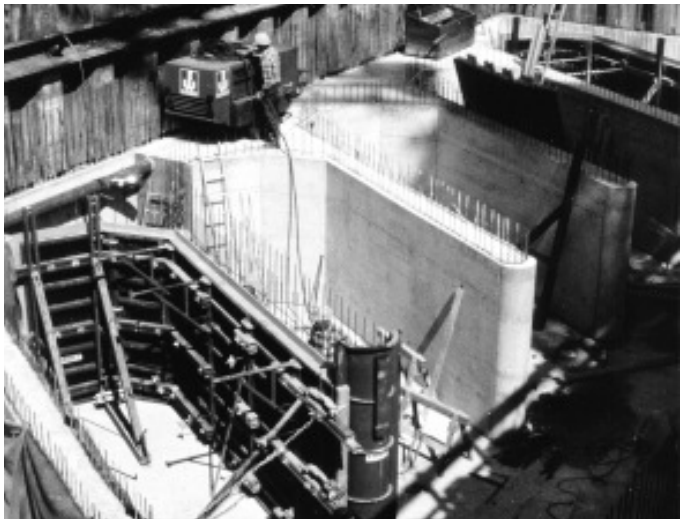
meva

Circular Column Formwork Circo

Technical Instruction Manual



Product features and important safety notes

The circular column formwork is totally made of steel and used to form fair-faced concrete columns.

The standard panel sizes are available in increments of 5 cm for diameters of 25 cm to 80 cm. The standard height of 300 cm and two extension heights of 50 cm and 100 cm allow users to pour columns of different heights in increments of 50 cm. The maximum admissible fresh concrete pressure is 120 kN/m².

The circular column formwork consists of 2 identical semi-circular column panels that are KTL/ACC-coated.

Only persons with sufficient skills and knowledge are permitted to assemble and disassemble the circular column formwork. This manual describes the standard assembly and disassembly. Deviations from the described standard assembly are permitted provided that users are able to judge and perform them.

The product components must be checked visually for damage before assemling and using them.

The circular column formwork must be assembled in the order described in this manual.

Abbreviations, measurements, decimal numbers, figures and tables

DIN means Deutsche Industrie-Norm (German Industrial Standard). E DIN (E = Entwurf / draft) means that the DIN is in draft status and not yet approved of. TÜV means Technischer Überwachungsverein. This is the independent German organisation that tests the safety of technical installations, machinery and motor vehicles. If a product passes the test, it is permitted to carry the GS seal. GS stands for Geprüfte Sicherheit (approved safety). Any further abbreviations are explained where they are used the first time.

Measurements: This manual uses the metric system and thus m (for metre), cm (for centimetre) and mm (for millimetre). Dimensions without a measure are in cm. Decimal numbers: Note that the comma is used in a decimal numbers, e.g. 1,5 means 1 and a half.

The page numbers in this manual start with CIRCO. The figures and tables are numbered per page. Depending on its product abbreviation, a cross reference in the text refers to a page, table or figure in this or in another manual.

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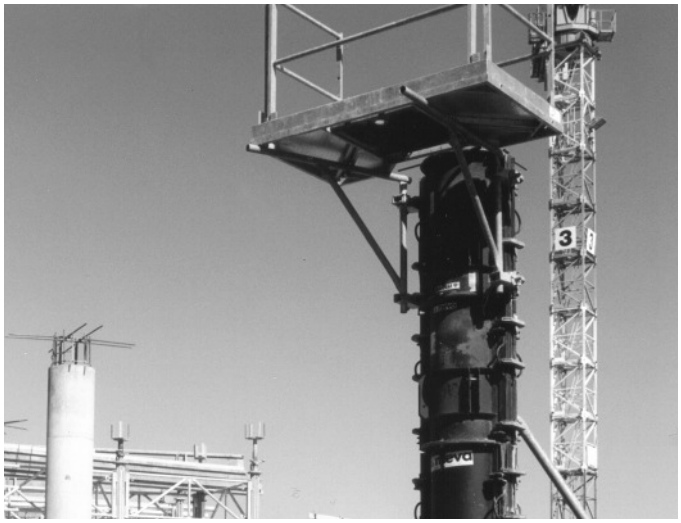
Updated 24 July 2009



Please note

These Technical Instruction Manual contains information, instructions and hints describing how to use the MEVA equipment on the construction site in a proper, quick and economic way. Most examples shown are standard applications that will occur in practice most often. For more complicated or special applications not covered in these instructions, please contact the MEVA experts for advice.

When using our products the federal, state and local codes and regulations must be observed. Many of the details shown do not illustrate the formwork system in the ready-to-pour condition as to the aforementioned safety regulations. Please adhere to this manual when applying the equipment described here. Deviations require engineering calculations and analysis to guarantee safety. Please observe the assembly instructions that your local contractor or employer has created for the site on which the MEVA equipment is used. Such instructions are intended to minimise site-specific risks and must contain the following details:

- The order in which all working steps including assembly and disassembly must be carried out
- The weight of the panels and other system parts
- The type and number of ties and braces as well as the distance between them
- The location, number and dimensions of working scaffolds including working area and protection against falling down
- Pick points for panel transport by crane. With regard to panel tranport, please observe this manual. Any deviation will require a static proof.

Important: Generally, only well maintained material may be used. Damaged parts must be replaced. Apply only original MEVA spare parts for replacement.

Attention: Never wax or oil assembly locks.

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Product overview

① Circular column formwork Circo Ø 25–80 cm
② Circo platform for the circular column formwork Ø 25–80 cm
③ Circo scaffolding bracket
④ Circo railing
⑤ Brace frame
⑥ Foldable protection (back)
⑦ Foldable lateral protection
⑧ Toeboard
⑨ Access hatch
⑩ Aluminium floor

Delivery of the Circo platform includes:
- 2 head bolts 16/90
- 2 cotter pins 4

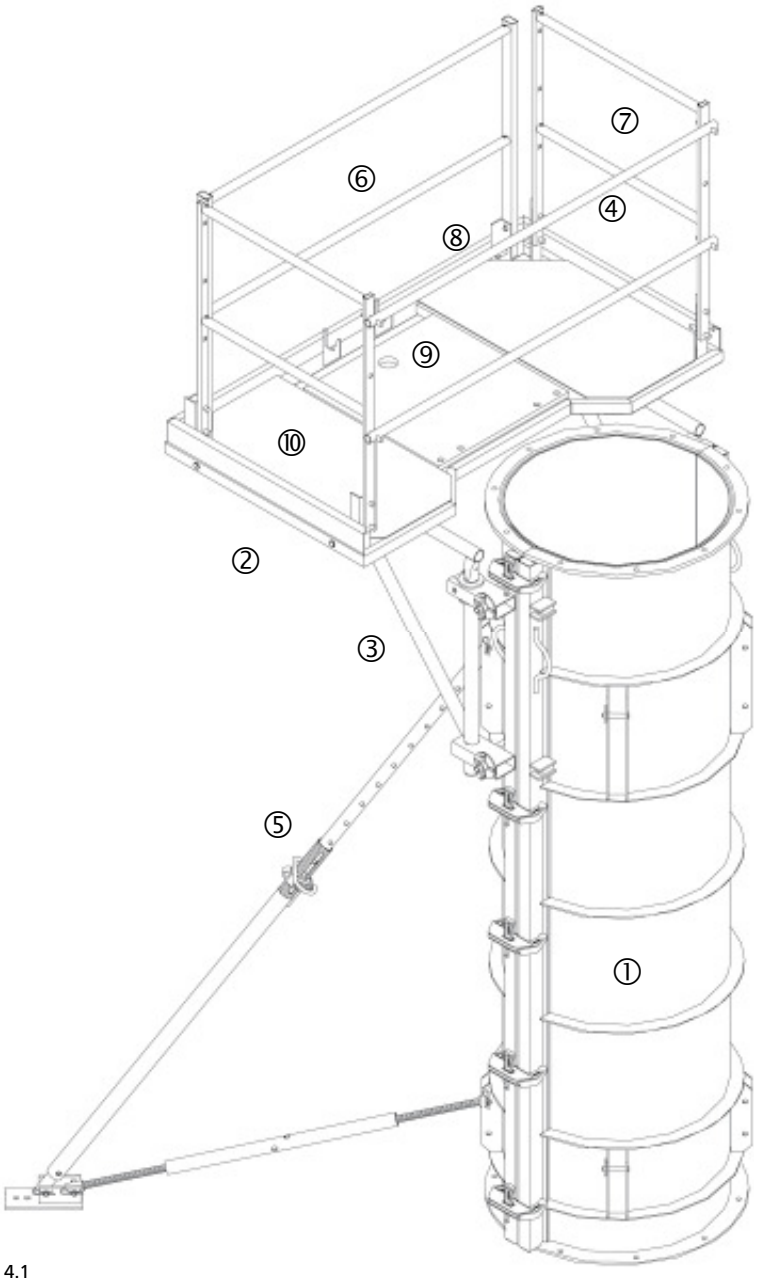

Fig. 4.1

Description	Artikel-Nr.
Circo platform	**29-415-10**
Circo scaffolding bracket	**29-415-20**
Circo railing	**29-415-25**
Flange screw 18	**29-401-10**
Brace frame 250 without connector	**29-109-25**
M assembly lock	**29-400-71**
Hexagonal screw M16x40	**63-120-49**
Hexagonal locking nut M16	**63-130-00**

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Storage and transport

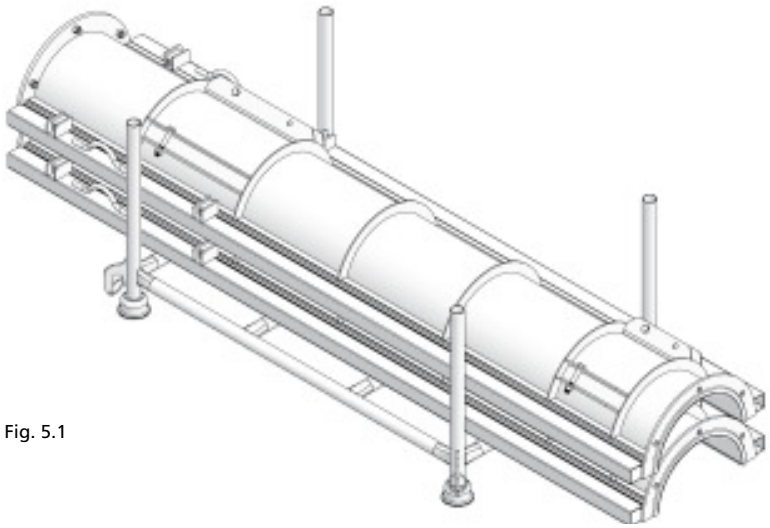

Fig. 5.1

The circular column panels can be stacked as shown in Fig. 5.1. This kind of storage protects the panel facing as much as possible from the weather.

The panels are stacked and transported in pairs of 2 semi-circular halves per stacking racks. The semi-circular halves can be transported individually, by crane, while in the stacking rack or by forklift.

When transporting the stacked panels in the stacking rack by crane, the crane slings are attached to the lateral suspension points of the stacking rack. For transport by forklift, the forklift moves its fork crosswise below the stacking rack.

Truck transport: 2 stacking racks can be placed side by side and 3 stacking racks on top of each other (Fig. 5.2).

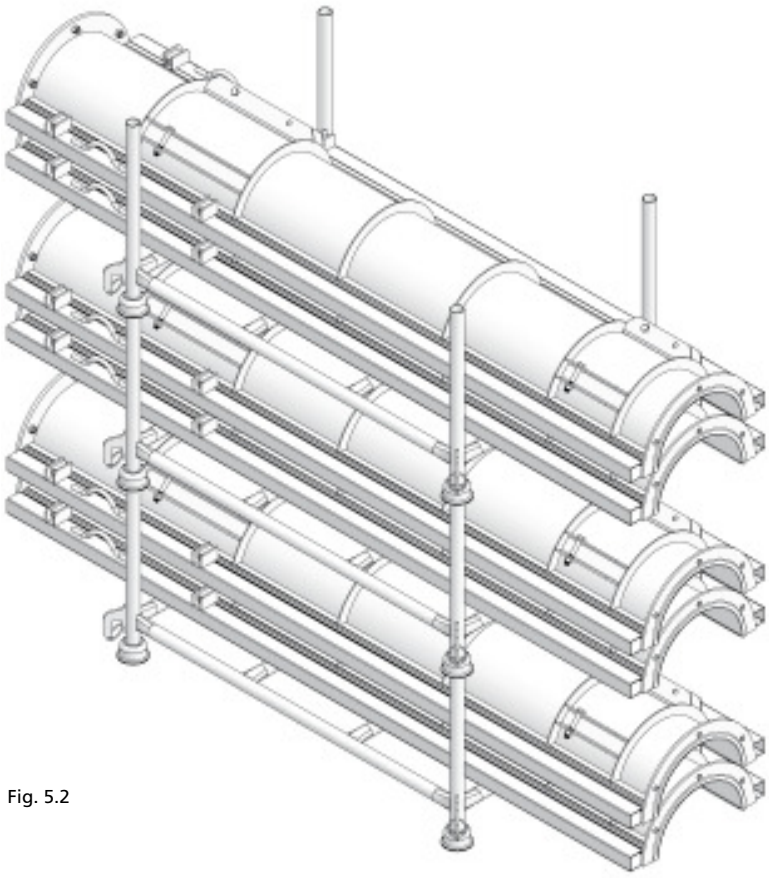

Fig. 5.2

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Assembly – Basic column formwork unit

This double page describes the assembly of a complete column formwork unit with platform and brace frames without connectors. Page 6 shows the parts that are required to assemble such a unit with a standard height of 300 cm. Refer to page 7 for a step-to-step assembly description.

Assembling extension panels, closing the formwork and other assembly topics are described in separate chapters starting on page CIRCO-8.

Bracing
Depending on its height, the column formwork is braced with 2 brace frames or with 2 push-pull props or – when the formwork is higher than 6,00 m – with Triplex braces. Table 7.2 helps you decide what type of bracing to use and what material to select.

The bracing is attached at the push-pull prop connectors to a semi-circular panel with the delivered head bolts 16/90 and cotter pins 4.

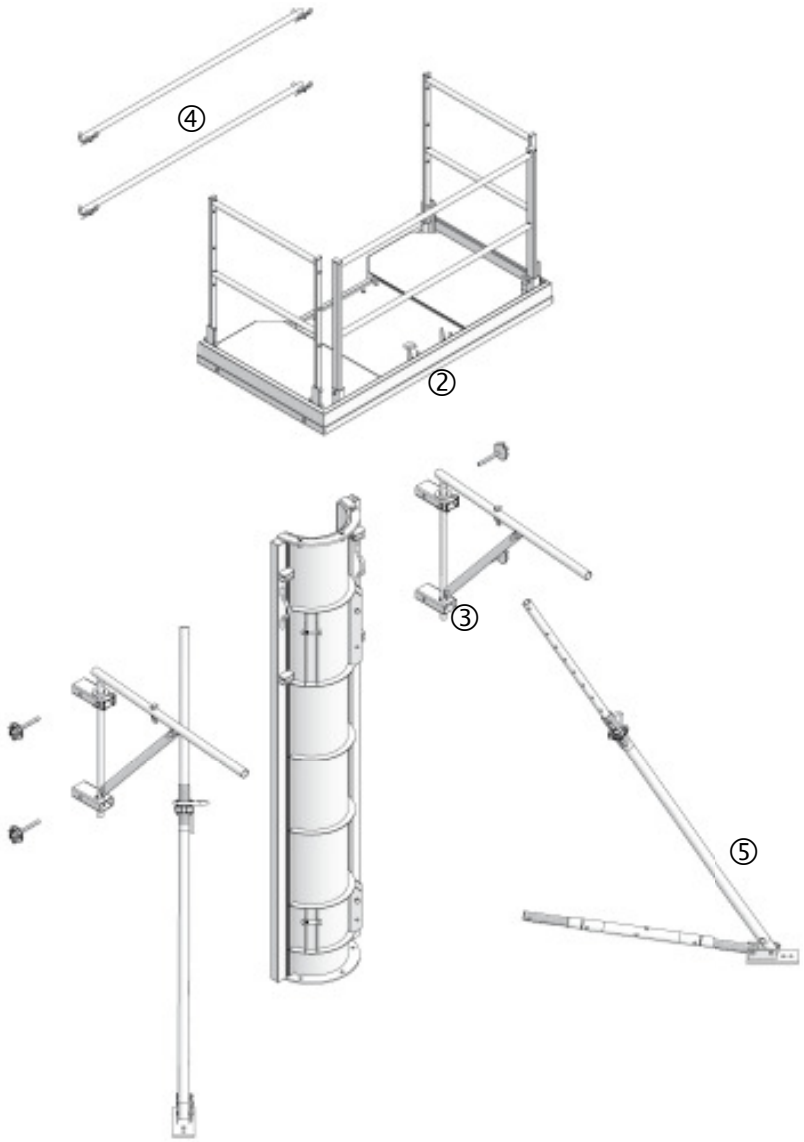

Fig. 6.1

The circular column formwork with standard height requires the following parts:

	Ref. No.	Description	Quantity	Weight
②	29-415-10	Circo platform	1	95,0 kg
③	29-415-20	Circo scaffolding bracket	2	17,0 kg
④	29-415-25	Circo railing	2	4,5 kg
⑤	29-109-25	Brace frame 250 without connector	2	28,0 kg
	29-401-10	Flange screw 18	4	1,1 kg
	29-400-71	M assembly locks	8	3,0 kg

The following parts are included in the circular column formwork delivery:
2 head bolts 16/90 and 2 cotter pins 4

Table 6.2

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Assembly – Basic column formwork unit

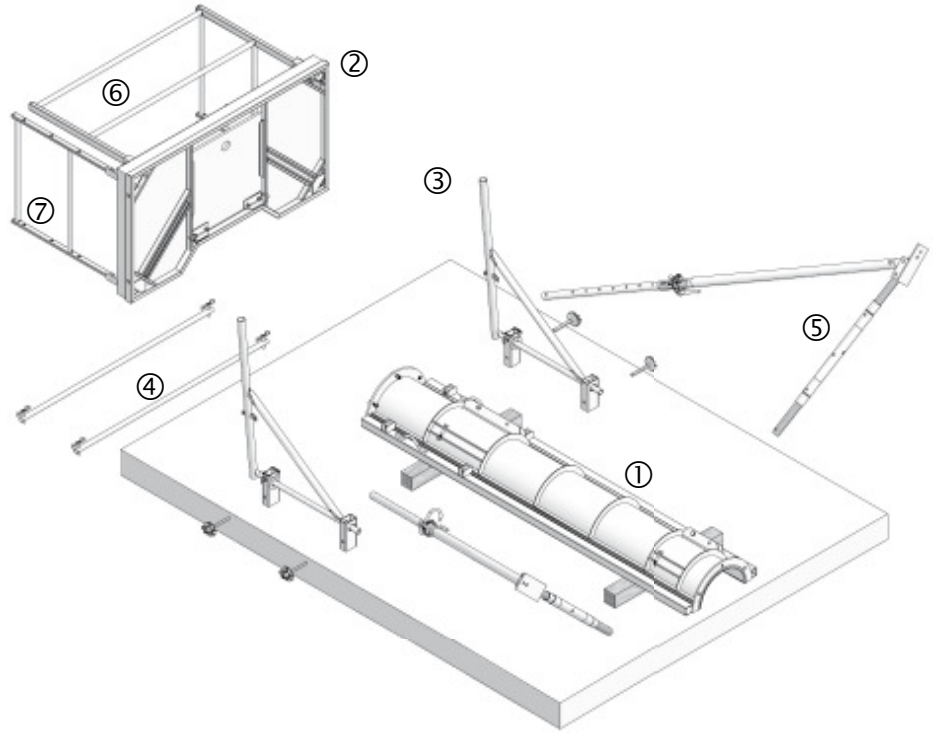

Fig. 7.1

Description	Ref. No.	Adjustment range (m)	Adm. pressure (kN)	Adm. tensile force (kN)	Weight (kg)	Recommend use
Braces SRL						
SRL 120	29-108-80	0,90–1,50	20,0	30,0	6,0	Horizontal alignment of wall foot, brace frame 250, climbing formwork
SRL 170	29-108-90	1,20–2,20	25,0	40,0	10,5	Fold shaft formwork
Push-pull props R						
R 160	29-109-40	1,35–2,00	25,0	25,0	11,0	Horizontal alignment
R 250	29-109-60	1,90–3,20	25,0	30,0	18,5	Top support of the brace frame 250 for formwork height up to 350 cm
R 460	29-109-80	3,40–5,20	20,0	30,0	35,8	Column formwork up to a height of 600 cm
R 630	29-109-85	5,10–7,60	9,5	25,0	67,8	Column formwork up to a height of 600 cm
Wall or column heights higher than 6,00 m						
Triplex R 680	—	6,40–7,20	45,0	45,0	123,0	Wall formwork, columns
Triplex R 780	—	7,40–8,20	45,0	45,0	139,0	Wall formwork, columns
Triplex R 880	—	8,40–9,20	45,0	45,0	149,0	Wall formwork, columns
Triplex R 980	—	9,40–10,20	35,0	45,0	160,0	Wall formwork, columns

Table 7.2

We recommend assembling the parts while they are lying on timber on flat ground (Fig. 7.1).

1. Place a semi-circular column panel ① on the timber with the panel's inside facing showing to the timber.
2. Attach the bracing with the head bolts 16/90 and cotter pins 4 to the semi-circular column panel. In the example brace frames 250 without connector ⑤ are used.
3. Attach the Circo scaffolding brackets ③ with flange screws 18 to the panel.
4. Attach the Circo platform ② with the hammer-head screws of the Circo scaffolding brackets at the platform's T-section to the scaffolding bracket.
5. Fold the platform's back protection ⑥ and lateral protection ⑦ up and plug both Circo railings to the Circo platform.
6. Attach 2-rope crane slings to the lateral brackets of the panel on the ground and erect it with the bracing and the Circo platform.
7. Immediately attach the footplates of the bracing to the concrete slab or mobile prefab concrete parts. Use adequate dowels for attachment.

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Assembly – Extension panels

The column formwork's height can be adjusted with extension panels. We recommend assembling the extension panels while the formwork lies on the ground. We also recommend adding the extension panels at the bottom of the existing circular formwork unit. This way, the Circo platform does not need to be detached from and re-attached to the formwork unit (Fig. 8.2).

1. Remove the screws.
2. Move the extension panels and basic formwork unit together and insert the screws again (Fig. 8.1).

Note that you can extend the circular column formwork several times without reducing their stability.

The panel joints get centered automatically so that they are flush.

Disassembly
Proceed in the opposite order.

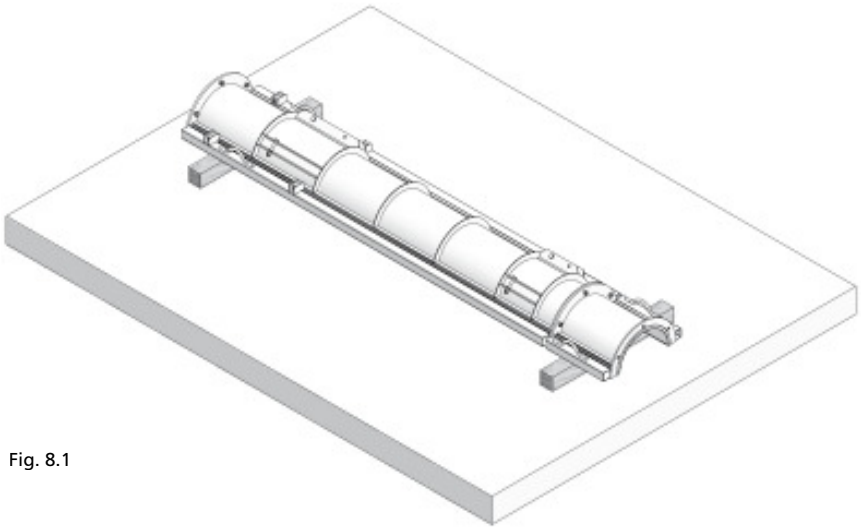

Fig. 8.1

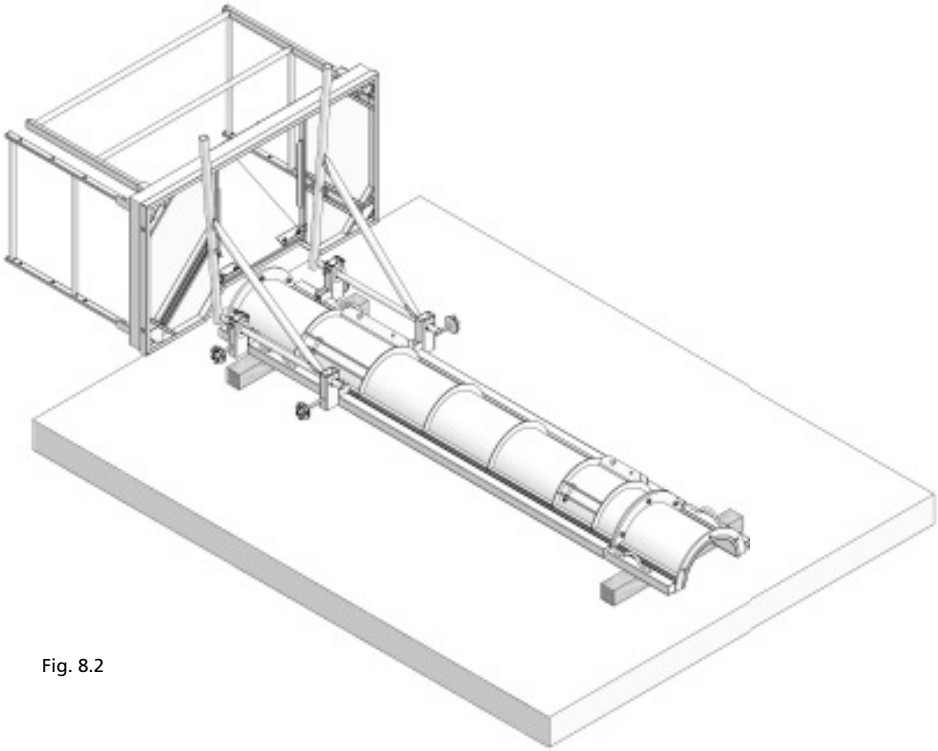

Fig. 8.2

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Assembly – Close the formwork

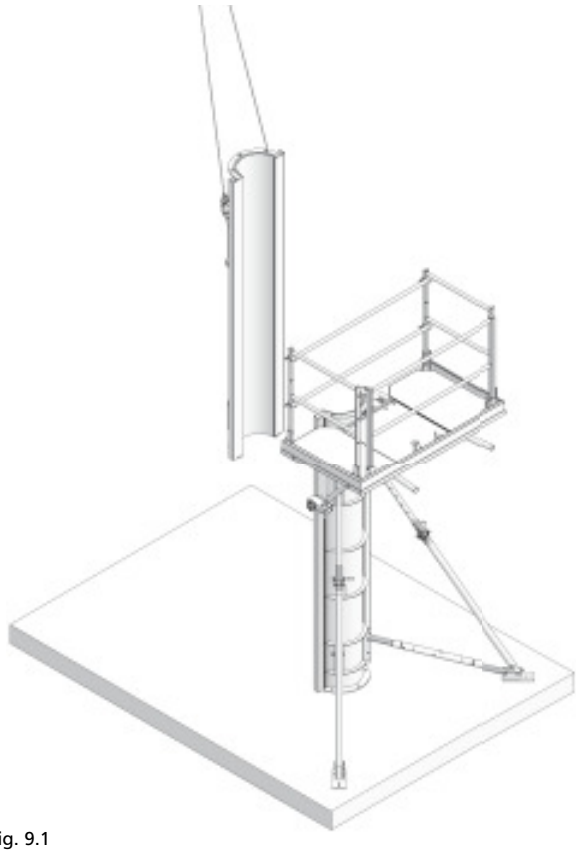

Fig. 9.1

The formwork cannot be closed unless the assembled and erected semi-circular column half (see p. CIRCO-7) stands solid and stable on the ground

1. Lift the second semi-circular column half with a crane next to the erected semi-circular column half (Fig. 9.1).
2. Tightly connect both semi-circular column halves with M assembly locks (Fig. 9.2).

Keep in mind that the number of required assembly locks depends on the formwork's hight and the column diameter. See p. CIRCO-11 and 12.

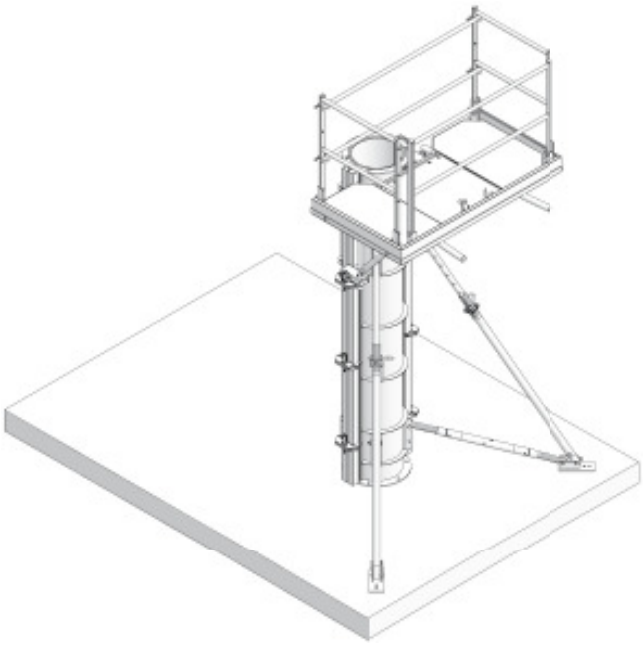

Fig. 9.2

Description	Artikel-Nr.
M assembly lock	**29-400-71**

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Assenbly – Round stop ends

The semi-circular column halves can be used to form round stop ends for walls that are poured using a MEVA wall formwork system. The diameter of the semi-circular column half must match the wall's thickness. For walls up to 60 cm thick, the M assembly lock is used to connect the Circo and wall formwork panels (Fig. 10.1 and 10.2). If the wall is 65 cm thick or thicker, use the transition lock Circo-Mammut to connect the panels (Fig. 10.3).

Keep in mind that the number of required assembly locks depends on the formwork's hight and column diameter (see p. CIRCO-11 and 12).

An additional bracing of the semi-circular column half is not required.

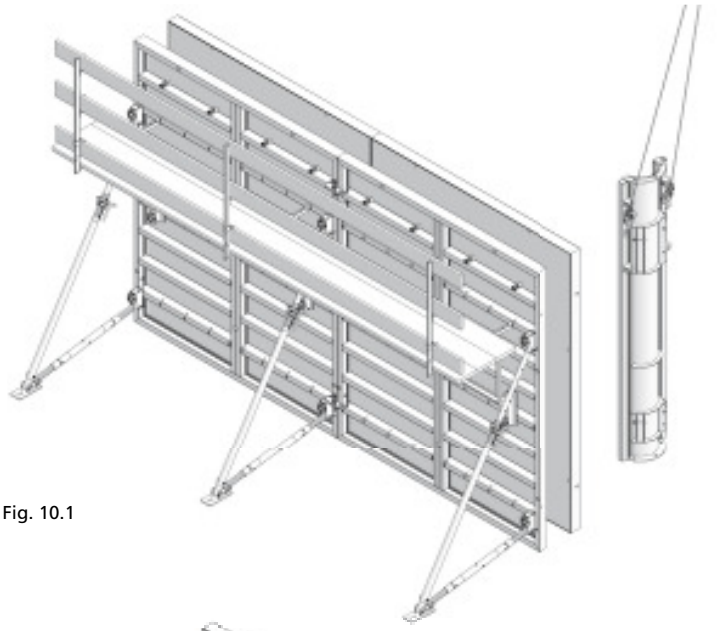

Fig. 10.1

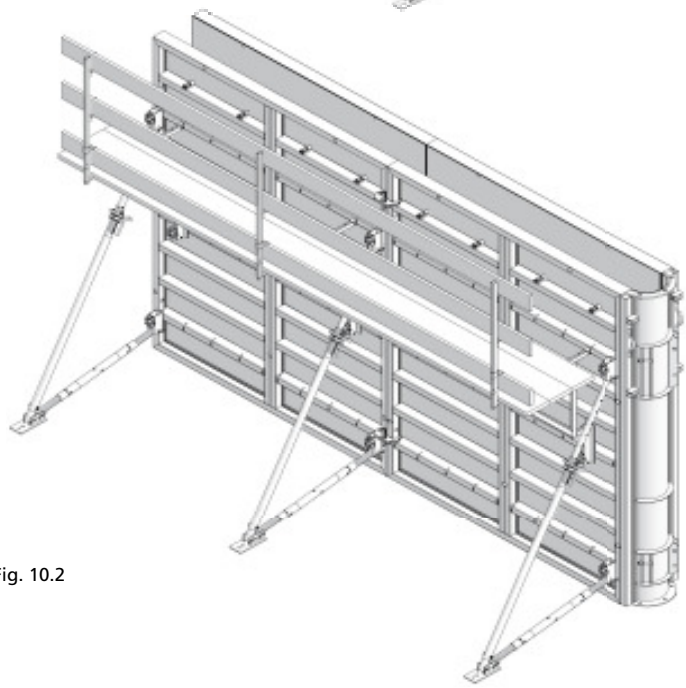

Fig. 10.2

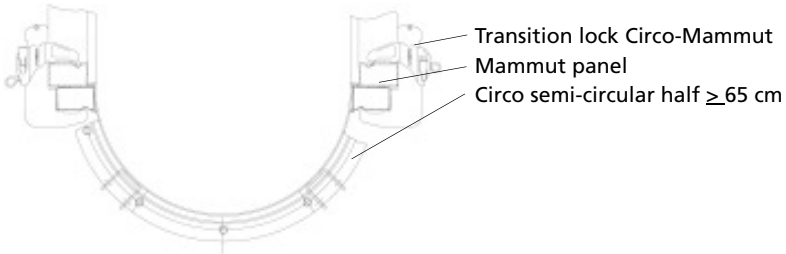

Fig. 10.3

Description	Artikel-Nr.
M assembly lock	**29-400-71**
Transition lock Circo-Mammut	**29-400-80**

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Assembly locks – Required quantity and spacing

The number of the required M assembly locks depends on the formwork height and column diameter, see figures 11.1 und 11.2. The maximum load is 120 kN/m².

Column diameter
Ø 25–50 cm

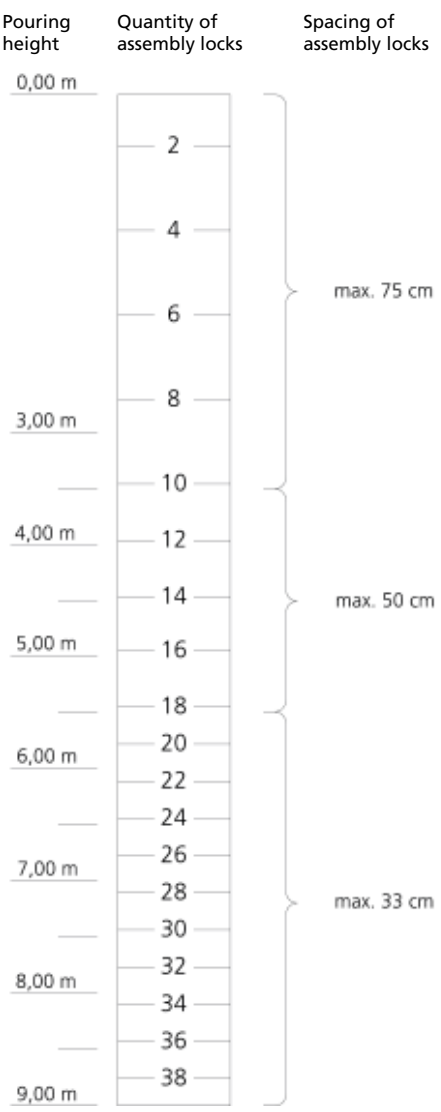

Fig. 11.1

Column diameter
Ø 55–80 cm

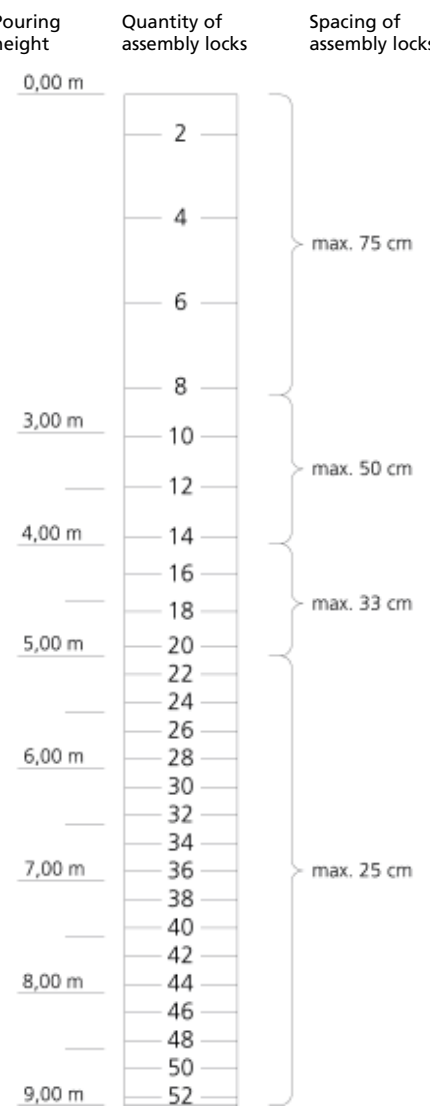

Fig. 11.2

Description	Ref. No.
M assembly lock	**29-400-71**

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Assembly locks – Formwork examples

Please note
The fresh concrete pressure is higher at the bottom of the column than at the top. This is why more assembly locks are required at the bottom than higher up, i.e. the spacing of the assembly locks must be smaller at the bottom (Fig. 12.1 und 12.2).

Column diameter
Ø 25–50 cm

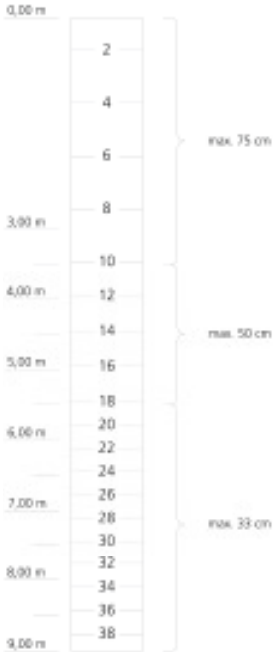

Fig. 12.1

Example 1
Column diameter: 30 cm
Pouring height: 6,00 m

Fig. 12.1 indicates that 22 assembly locks are required for a pouring height of 6,00 m (this height lies between 20 and 22 assembly locks, in this case the next higher quantity of assembly locks is chosen). This means that 11 assembly locks are required per semi-circular column half.

The spacing of the assembly locks (seen from the top of the column):
The maximum spacing is 75 cm up to the 5th level of assembly locks, it is maximum 50 cm for the 6th through the 9th level (seen from the top). The spacing is 33 cm for the 10th and the 11th level. The lowest level of assembly locks should be located as near to the ground as possible, however make sure you leave enough room and distance to the ground for disassembly.

Column diameter
Ø 55–80 cm

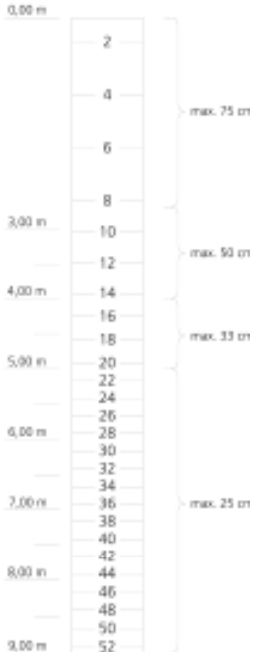

Fig. 12.2

Example 2
Column diameter: 60 cm
Pouring height: 6,00 m

Fig. 12.2 indicates that 30 assembly locks are required for a pouring height of 6,00 m (this height lies between 28 and 30 assembly locks, in this case the next higher quantity of assembly locks is chosen). This means that 15 assembly locks are required per semi-circular column half.

The spacing of the assembly locks (seen from the top of the column):
The maximum spacing is 75 cm up to the 4th level of assembly locks, it is maximum 50 cm for the 5th through the 7th level (seen from the top). The spacing is 33 cm for the 8th through the 10th level. The lowest level of assembly locks should be located as near to the ground as possible, however make sure you leave enough room and distance to the ground for disassembly.

Description	Artikel-Nr.
M assembly lock	**29-400-71**

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Access to the Circo platform

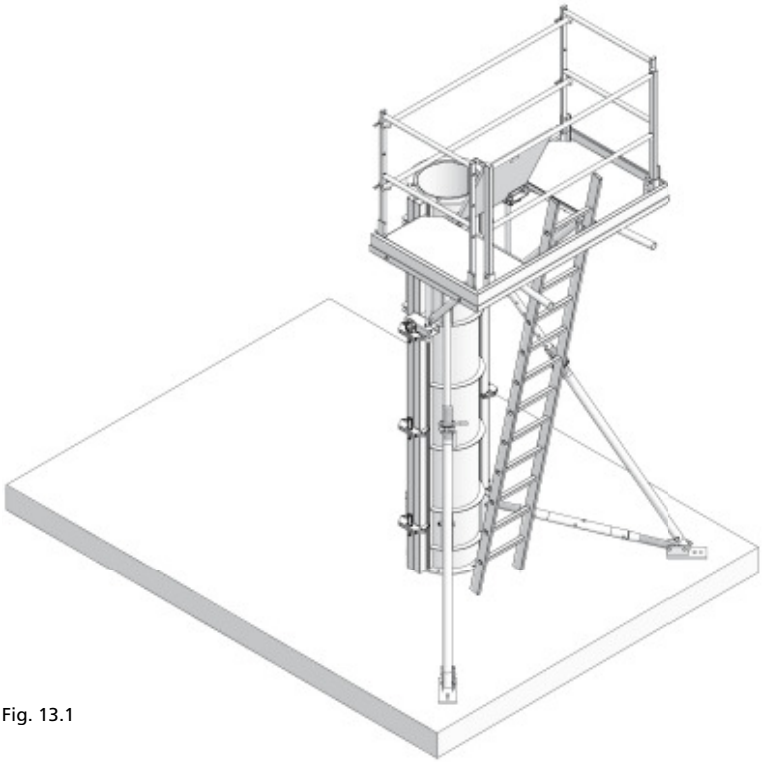

Fig. 13.1

Ladder or stair tower
For a platform height of up to 5,00 m, a ladder can be used to access the platform (Fig. 13.1).

For a platform higher than 5,00 m, a stair tower or lift must be used. The area between the stair tower and the Circo platform must be closed with planks and safety equipment (custom-tailored on-site solution).

Please note
The above regulations are valid for Germany. If you use the Circo column formwork and platform outside Germany, please make sure you observe the local regulations as set out by local law.

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Disassembly

1. Attach 2-rope crane slings to the second semi-circular column half (the one without the platform and bracing). Tension the crane slings and remove all M assembly locks (Fig. 14.1).
2. Force the semi-circular columns halves apart with a wooden wedge. Place the one that is attached to the crane on the ground for cleaning (Fig. 14.2).
3. Attach the crane slings to the semi-circular column half that is still erected. Tension the crane slings.
4. Loosen the doweled footplates of the bracing.
5. Place the semi-circular column half also on the ground for cleaning, the platform must be on the ground side (Fig. 14.3).
6. Remove dirt with a broom or cloth. Do not clean the steel facing with scratching devices or beat on it.
7. Spray the release agent MevaTrenn.
8. In order to detach the bracing and platform, turn the semi-circular column half so that its steel facing is on the ground side.

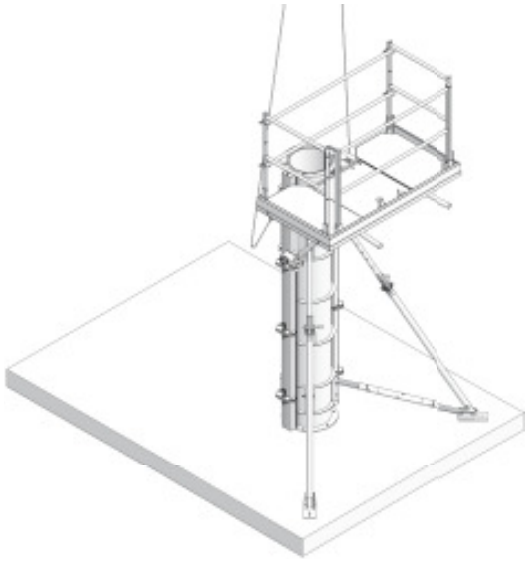

Fig. 14.1

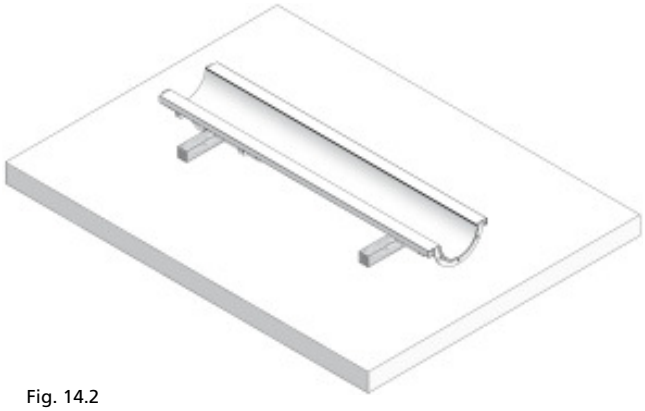

Fig. 14.2

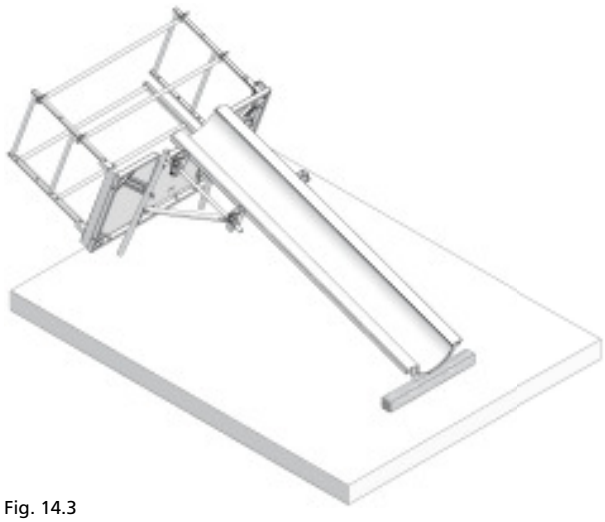

Fig. 14.3

Description	Ref. No.
MevaTrenn FTP	
30 litre can	**29-203-93**
200 litre barrel	**29-203-97**
1000 litre container	**29-203-98**
Stainless steel jet FT8	**29-203-94**
Sprayer (5 litre tank)	**29-903-70**
Tap for 1000 litre container	**29-203-99**

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Services

Cleaning
The formwork is cleaned professionally upon return. Cleaning is done using industrial equipment with assembly lines.

Regeneration
The regeneration is carried out as follows: The frames are checked and, if necessary, repaired, painted and provided with a new facing.

As long as the formwork equipment is up-to-date, a regeneration will always be a more economical solution than purchasing new formwork.

Please note that the cleaning and regeneration service is not available in all countries in which MEVA does business.

Rentals
With much equipment on stock, we offer our customers the option of renting supplementary material during peak times. We also give prospective customers the chance to test MEVA formwork so they can see its benefits for themselves in actual use.

RentalPlus
Since MEVA started the flat rate for cleaning and repair of rented formwork systems in early 2000, more and more contractors experience the outstanding advantages. Ask our representatives about the details!

Formwork drawings
Of course, all offices in our technical department have CAD facilities. You get expert, clearly represented plans and work cycle drawings.

MBS
MEVA Basic Support
MBS is an addition to AutoCAD, developed by MEVA Formwork Systems in 2000. MBS is based on standard programs (AutoCAD and Excel) and can be used on any PC that has these two programs installed. It includes pull down menues for AutoCAD and applications to ease forming. It also includes the possibility to create take-offs.

Special solutions
We can help with special parts, custom-designed for your project, as a supplement to our formwork systems.

Static calculations
Generally, this is only necessary for applications like single-sided formwork where the anchor parts are embedded in the foundation or the base slab. If requested, we can perform static calculations for such applications at an additional charge.

Formwork seminars
To make sure that all our products are used properly and efficiently, we offer formwork seminars. They provide our customers a good opportunity to keep themselves up-to-date and to benefit from the know-how of our engineers.

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Notes

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