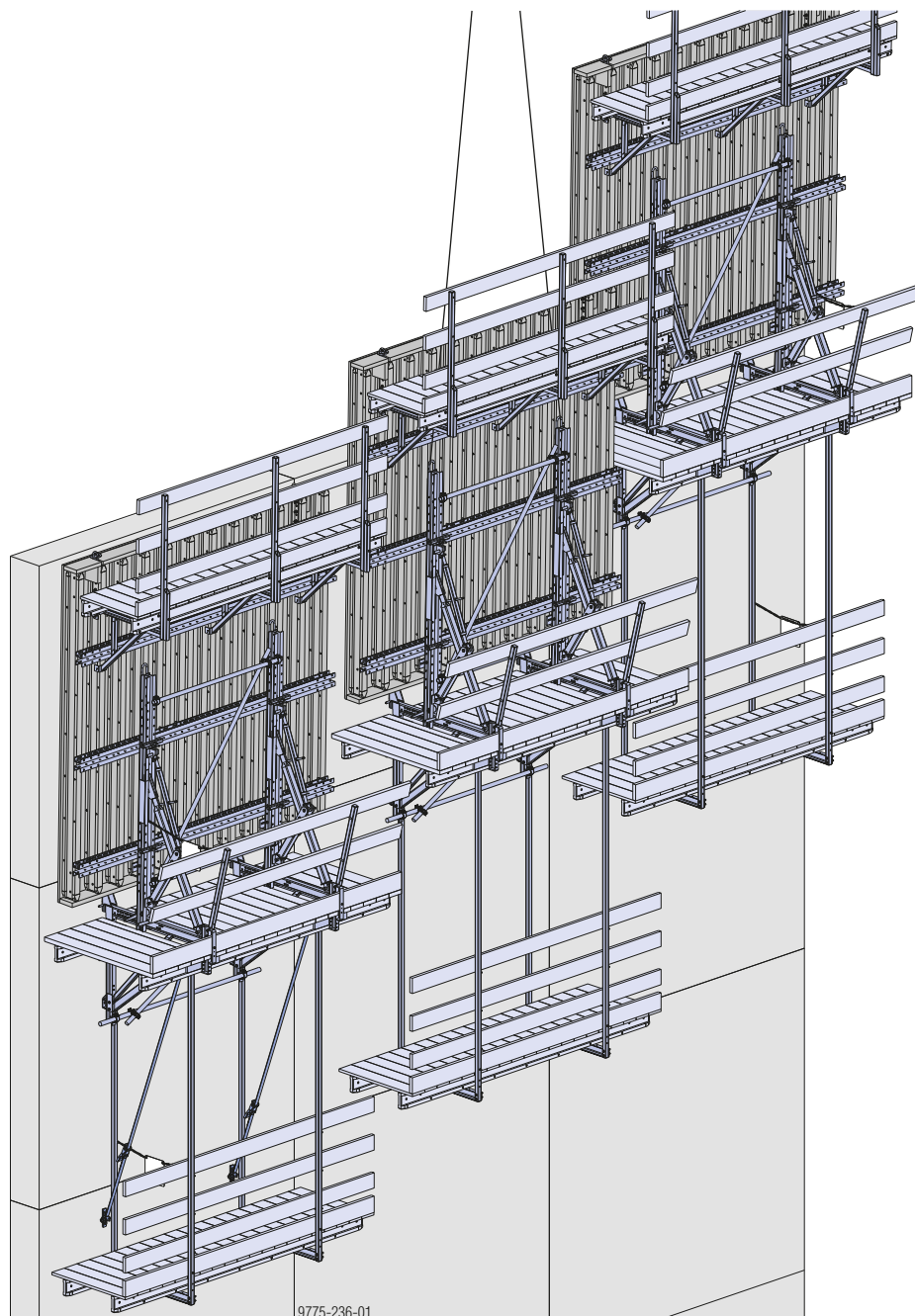


The Formwork Experts.

Climbing formwork 150F

User Information

Instructions for assembly and use (Method statement)



9775-236-01

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Introduction

Elementary safety warnings

User target groups

- This booklet is aimed at all persons who will be working with the Doka product or system that it describes. It contains information on the standard design for setting up this system, and on correct, compliant utilisation of the system.
- All persons working with the product described herein must be familiar with the contents of this booklet and with all the safety instructions it contains.
- Persons who are incapable of reading and understanding this booklet, or who can do so only with difficulty, must be instructed and trained by the customer.
- The customer is to ensure that the information materials provided by Doka (e.g. User Information booklets, Instructions for Assembly and Use, Operating Instruction manuals, plans etc.) are up to date and available to all users, and that they have been made aware of them and have easy access to them at the usage location.
- In the relevant technical documentation and formwork utilisation plans, Doka shows the workplace safety precautions that are necessary in order to use the Doka products safely in the usage situations shown.
In all cases, users are obliged to ensure compliance with national laws, standards and regulations throughout the entire project and to take appropriate additional or alternative workplace safety precautions where necessary.

Hazard assessment

- The customer is responsible for drawing up, documenting, implementing and continually updating a hazard assessment at every job-site.
This booklet serves as the basis for the site-specific hazard assessment, and for the instructions given to users on how to prepare and utilise the system. It does not substitute for these, however.

Remarks on this booklet

- This document can be used as general Instructions for Assembly and Use (Method Statement) or be incorporated into site-specific Instructions for Assembly and Use (Method Statement).
- **The graphics, animations and videos in this document or app sometimes depict partially assembled assemblies and may require additional safety equipment and/or measures to comply with safety regulations.**
The customer must ensure all applicable regulations are complied with, even if they are not shown or implied in the graphics, animations and videos provided.
- **Individual sections contain further safety instructions and/or special warnings as applicable.**

Planning

- Provide safe workplaces for those using the formwork (e.g. for when it is being erected/dismantled, modified or repositioned etc). It must be possible to get to and from these workplaces via safe access routes!
- **If you are considering any deviation from the details and instructions given in this booklet, or any application which goes beyond those described in the booklet, then revised static calculations must be produced for checking, as well as supplementary assembly instructions.**

Regulations; industrial safety

- All laws, Standards, industrial safety regulations and other safety rules applying to the utilisation of our products in the country and/or region in which you are operating must be observed at all times.
- If a person or object falls against, or into, the side-guard component and/or any of its accessories, the component affected may only continue in use after it has been inspected and passed by an expert.

Rules applying during all phases of the assignment

- The customer must ensure that this product is erected and dismantled, reset and generally used for its intended purpose in accordance with the applicable laws, standards and rules, under the direction and supervision of suitably skilled persons. These persons' mental and physical capacity must not in any way be impaired by alcohol, medicines or drugs.
- Doka products are technical working appliances which are intended for industrial / commercial use only, always in accordance with the respective Doka User Information booklets or other technical documentation authored by Doka.
- The stability and load-bearing capacity of all components and units must be ensured during all phases of the construction work!
- Do not step on or apply strain to cantilevers, closures, etc. until suitable measures to ensure their stability have been correctly implemented (e.g. by tie-backs).
- Strict attention to and compliance with the functional instructions, safety instructions and load specifications are required. Non-compliance can cause accidents and severe injury (risk of fatality) and considerable damage to property.
- Sources of fire in the vicinity of the formwork are prohibited. Heaters are permissible only when used correctly and situated at a correspondingly safe distance from the formwork.
- Customer must give due consideration to any and all effects of the weather on the equipment and regards both its use and storage (e.g. slippery surfaces, risk of slipping, effects of the wind, etc.) and implement appropriate precautionary measures to secure the equipment and surrounding areas and to protect workers.
- All connections must be checked at regular intervals to ensure that they are secure and in full working order.
In particular threaded connections and wedged connections have to be checked and retightened as necessary in accordance with activity on the jobsite and especially after out-of-the-ordinary occurrences (e.g. after a storm).
- It is strictly forbidden to weld Doka products – in particular anchoring/tying components, suspension components, connector components and castings etc. – or otherwise subject them to heating.
Welding causes serious change in the microstructure of the materials from which these components are made. This leads to a dramatic drop in the failure load, representing a very great risk to safety.
It is permissible to cut individual tie rods to length with metal cutting discs (introduction of heat at the end of the rod only), but it is important to ensure that flying sparks do not heat and thus damage other tie rods.
The only articles which are allowed to be welded are those for which the Doka literature expressly points out that welding is permitted.

Assembly

- The equipment/system must be inspected by the customer before use, to ensure that it is in an acceptable condition. Steps must be taken to exclude components that are damaged, deformed, or weakened due to wear, corrosion or rot (e.g. fungal decay).
- Using our safety and formwork systems together with those of other manufacturers can create risks that may lead to injury and damage to property. This requires separate verification.
- The equipment/system must be assembled and erected in accordance with the applicable laws, standards and rules by trained customer personnel whilst maintaining any applicable safety inspections that may be required.
- It is not permitted to modify Doka products; such modifications constitute a safety risk.

Closing the formwork

- Doka products and systems must be set up so that all loads acting upon them are safely transferred!

Pouring

- Do not exceed the permitted fresh-concrete pressures. Over-high pouring rates overload the formwork, cause greater deflection and risk breakage.

Stripping the formwork

- Do not strip out the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be stripped out!
- When stripping out the formwork, never use the crane to break concrete cohesion. Use suitable tools such as timber wedges, special pry-bars or system features such as Framax stripping corners.
- When stripping out the formwork, do not endanger the stability of any part of the structure, or of any scaffolding, platforms or formwork that is still in place!

Transporting, stacking and storing

- Observe all country-specific regulations applying to the handling of formwork and scaffolding. For system formwork the Doka slinging means stated in this booklet must be used – this is a mandatory requirement.
If the type of sling is not specified in this document, the customer must use slinging means that are suitable for the application envisaged and that comply with the regulations.
- When lifting, always make sure that the unit to be lifted and its individual parts can absorb the forces that occur.
- Remove loose parts or secure them so that they cannot slip out of position and drop.
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this document!

Maintenance

- Only original Doka components may be used as spare parts. Repairs may only be carried out by the manufacturer or authorised facilities.

Miscellaneous

The weights as stated are averages for new material; actual weights can differ, depending on material tolerances. Dirt accretions, moisture saturation, etc. can also affect weight.

We reserve the right to make alterations in the interests of technical progress.

Eurocodes at Doka

The permissible values stated in Doka documents (e.g. $F_{perm} = 70 \text{ kN}$) are not design values (e.g. $F_{Rd} = 105 \text{ kN}$)!

- It is essential to avoid confusing permissible values with design values!
- Doka documents will continue to state the permissible values.

Allowance has been made for the following partial factors:

- $\gamma_F = 1.5$
- $\gamma_{M, \text{timber}} = 1.3$
- $\gamma_{M, \text{steel}} = 1.1$
- $k_{mod} = 0.9$

Consequently, all the design values for an EC design calculation can be determined from the permissible values.

Symbols used

The following symbols are used in this document:



DANGER

This is a notifier drawing attention to an extremely dangerous situation in which non-compliance with this notifier will lead to death or severe, irreversible injury.



WARNING

This is a notifier drawing attention to a dangerous situation in which non-compliance with this notifier can lead to death or severe, irreversible injury.



CAUTION

This is a notifier drawing attention to a dangerous situation in which non-compliance with this notifier can lead to slight, reversible injury.



NOTICE

This is a notifier drawing attention to a situation in which non-compliance with this notifier can lead to malfunctions or damage to property.



Instruction

Indicates that actions have to be performed by the user.



Sight-check

Indicates that you need to do a sight-check to make sure that necessary actions have been carried out.



Tip

Points out useful practical tips.



Reference

Cross-references other documents.

Services

Support in every stage of the project

- Project success assured by products and services from a single source.
- Competent support from planning through to assembly directly on site.

Project assistance from start to finish

Every single project is unique and calls for individualised solutions. When it comes to the forming operations, the Doka team can help you with its consulting, planning and ancillary services in the field, enabling you to carry out your project effectively, safely and reliably. Doka assists you with individual consulting services and customised training courses.

Efficient planning for a safe project sequence

Efficient formwork solutions can only be developed economically if there is an understanding of project requirements and construction processes. This understanding is the basis of Doka engineering services.

Optimise construction workflows with Doka

Doka offers special tools that help you in designing transparent processes. This is the way to speed up pouring processes, optimise inventories and create more efficient formwork planning processes.

Custom formwork and on-site assembly

To complement its system formwork range, Doka offers customised formwork units. And specially trained personnel assemble load-bearing towers and formwork on site.

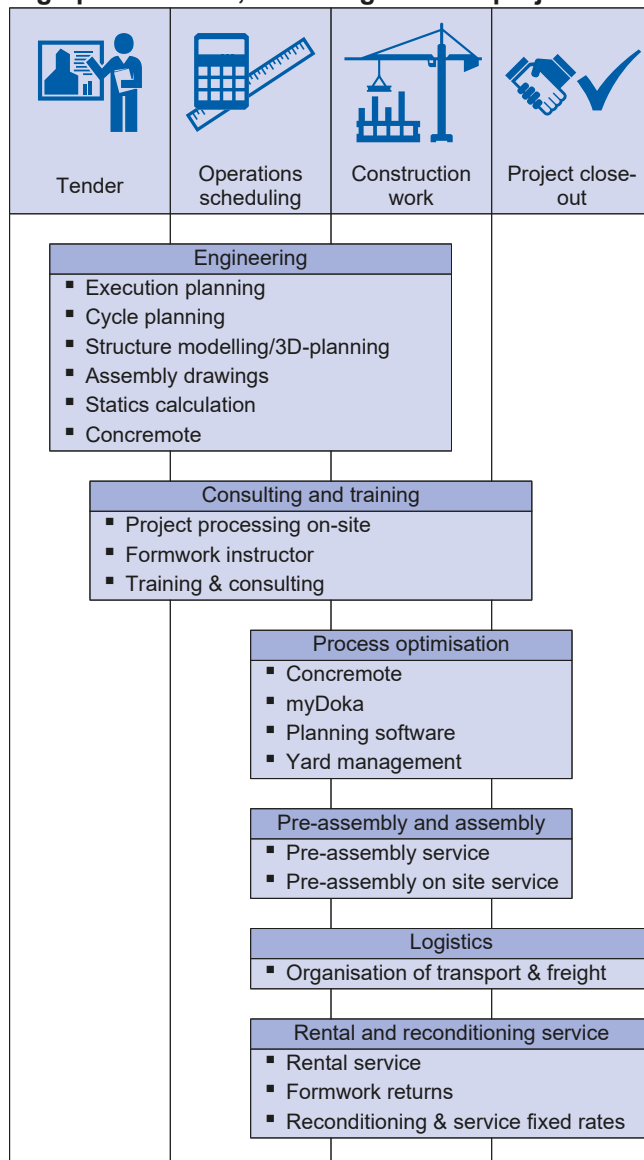
Just-in-time availability

Formwork availability is a crucial factor in realising your project on time and on budget. The worldwide logistics network puts the necessary formwork quantities on site at the agreed time.

Rental and reconditioning service

The formwork material needed for any particular project can be rented from Doka's high-performing rental park. Doka Reconditioning cleans and overhauls both client-owned equipment and Doka rental equipment.

High performance, in all stages of the project



upbeat construction digital services for higher productivity

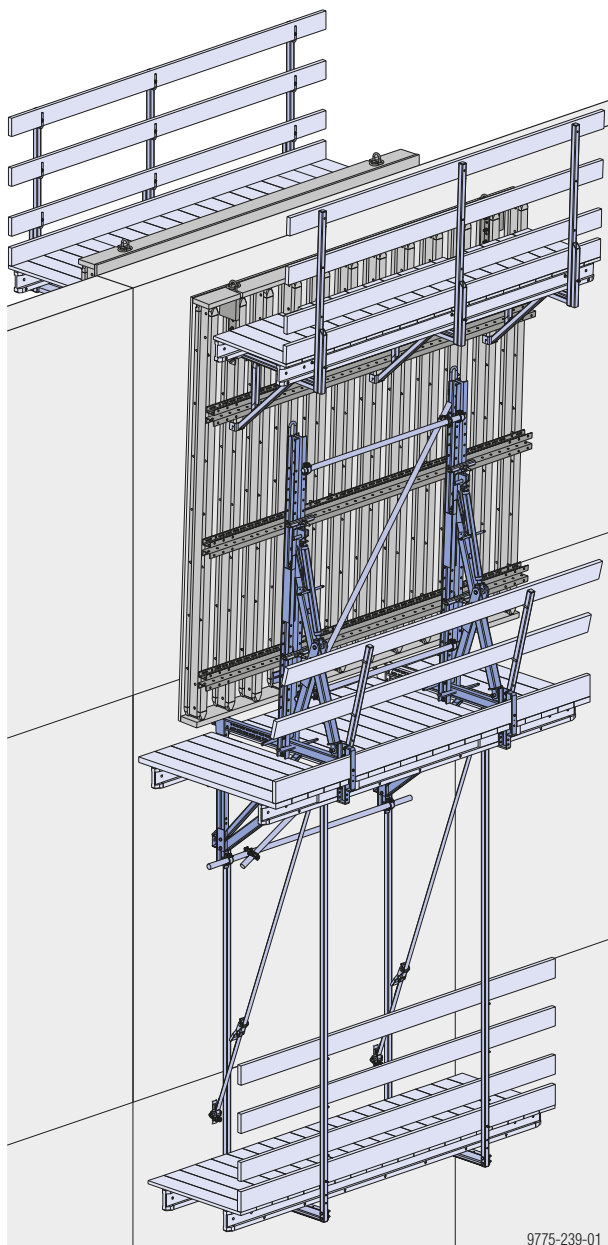
From planning through to completion - with upbeat construction we'll be moving construction forward and upping the beat for more productive building with all our digital services. Our digital portfolio covers the entire construction process and is being extended all the time. To find out more about our specially developed solutions go to doka.com/upbeatconstruction.

System description

Climbing formwork 150F

Straightforward basic design, easy to operate, proven thousands of times over

The Climbing formwork 150 F is a site-proven system that gives very cost-efficient service on crane-lifted climbing projects.



9775-239-01

Ingenious modular system with only a very few separate parts

- permits easy adaptation to construction projects with vertical walls
- provides 1.65 m wide working platforms with an up to 70 cm roll-back for the formwork

Easy to operate

- Fast set-up and stripping of the formwork without crane.
- Less crane time needed, as the formwork repositions quickly as a complete unit
- Formwork can be adjusted in all directions both precisely and quickly

Handy, practical design

- high load-bearing capacity (35 kN per Climbing bracket)
- formwork heights of up to 6.0 m
- concrete loads transferred by way of form-ties
- suitable for timber-beam and framed formwork
- cost-saving anchorages

Safe workspaces and workplace access routes

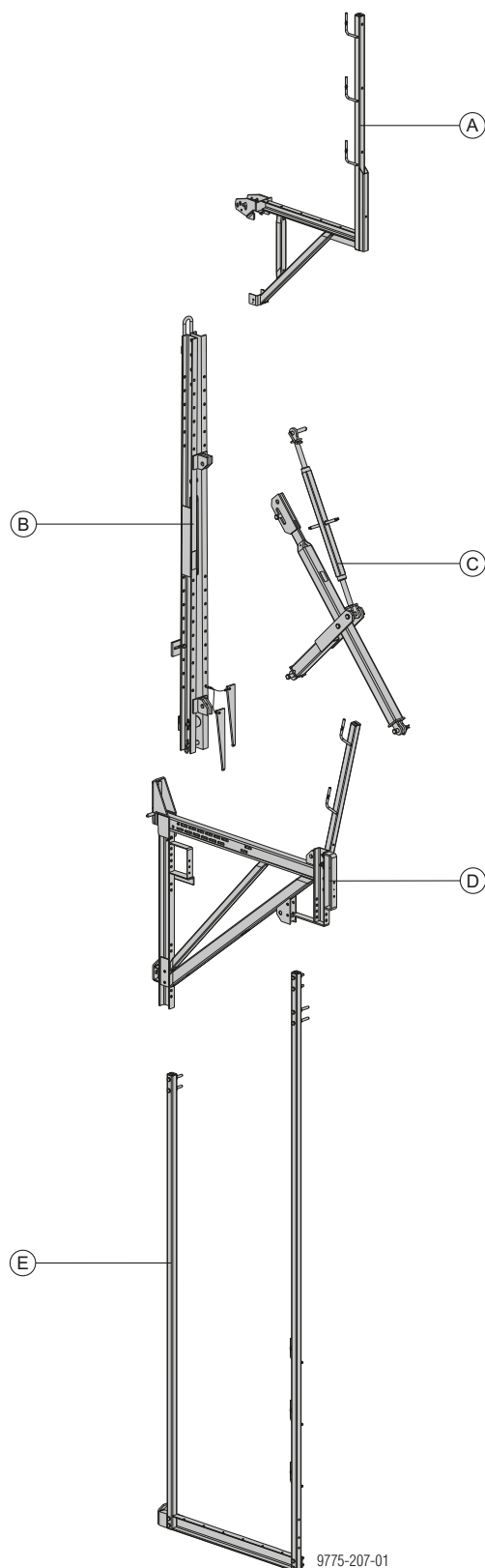
- Ladder system XS can be integrated

Areas of use

Climbing formwork 150 F is particularly suitable for:

- lift-shafts and stairwells
- bridge piers
- silos, tanks and power-station projects

System overview



- A Platform system for the formwork being used
- B Vertical waling 3.00m
- C Scissor-action spindle
- D Climbing bracket 150F
- E Suspended platform 120 3.30m or 4.30m

Pouring platform

- Platform system for the formwork being used (A)

Vertical waling and Scissor-action spindle

- **Vertical waling 3.00m (B)**
For holding the formwork elements/panels. The wedges are used for fixing the Vertical waling and for pressing the formwork against the concrete.
- **Scissor-action spindle (C)**
A screwjack mechanism with a scissor-type function for aligning and repositioning the formwork elements or panels. Permits up to 70 cm roll-back.

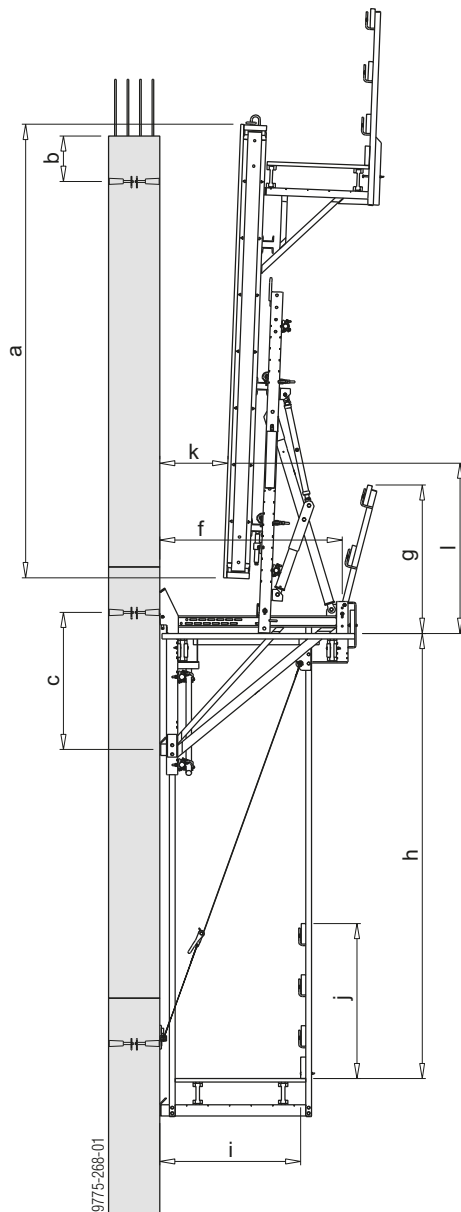
Working platform

- **Climbing bracket 150F (D)**
The Climbing bracket 150F is used for constructing the working platform, and carries the retractable formwork element or panel.

Suspended platform

- **Suspended platform 120 3.30m or 4.30m (E)**
120 cm wide suspended platform for bolting onto the Climbing bracket.

System dimensions



System dimensions [mm]

a	Formwork height	6000
b	Distance between top of poured concrete and anchoring point	400
c	Distance between suspension point and pressure strut	1250
f	Width of bracket	1700
g	Height of railings on bracket	1300
h	Distance between bracket and suspended platform	2900 ¹⁾ / 3900 ²⁾
i	Width of suspended platform	1240
j	Height of railings on suspended platform	1370
k	Distance between formwork and concrete	670
l	Height of measuring point for k	1500

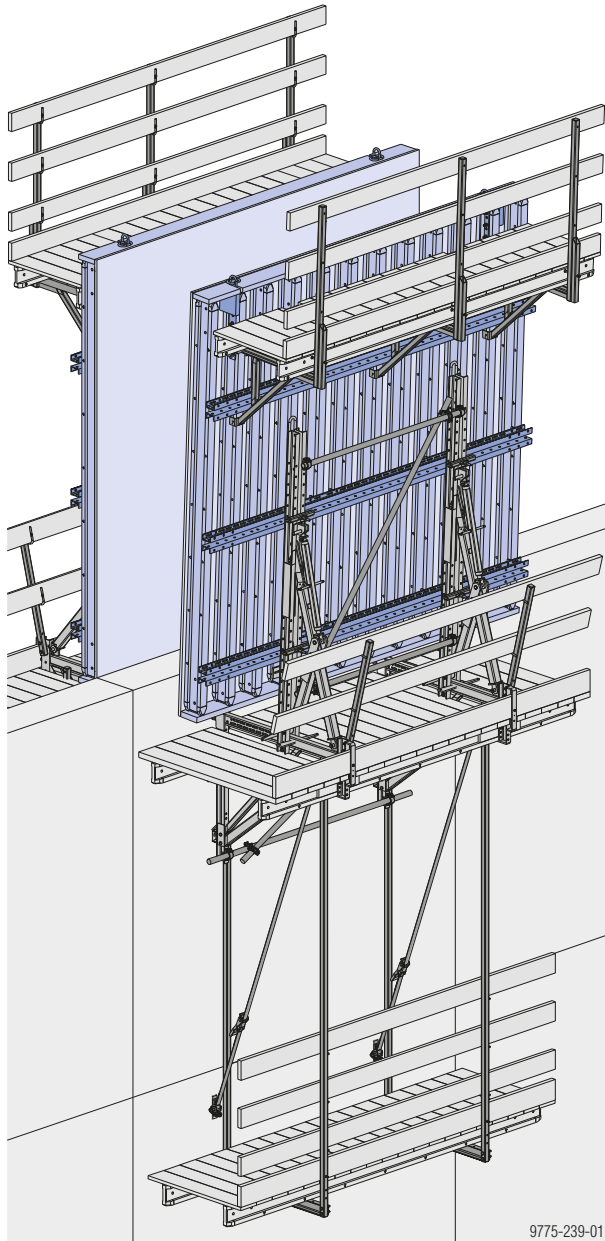
¹⁾ with Suspended platform 120 3.30m

²⁾ with Suspended platform 120 4.30m

Possible formwork systems

Timber-beam formwork

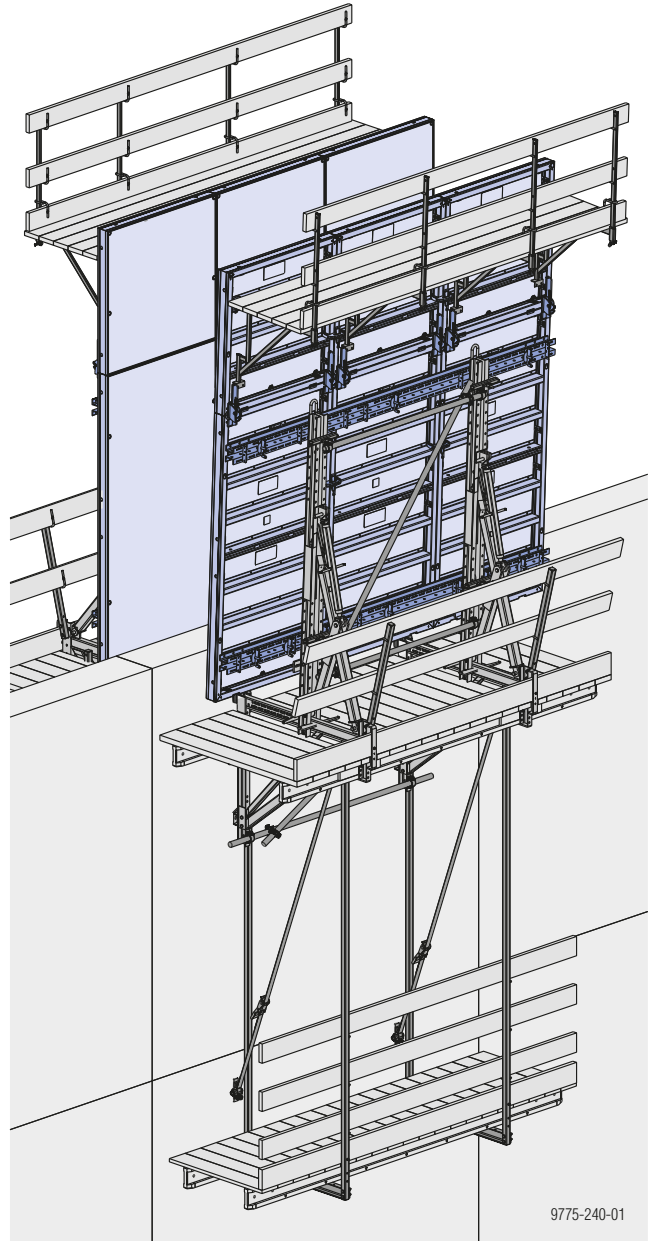
e.g. Large-area formwork Top 50



For more information, see the 'Timber-beam formwork Top 50' User Information booklet.

Framed formwork

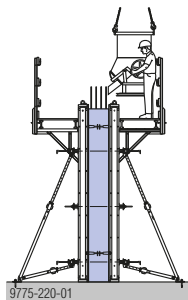
e.g. framed formwork Framax Xlife



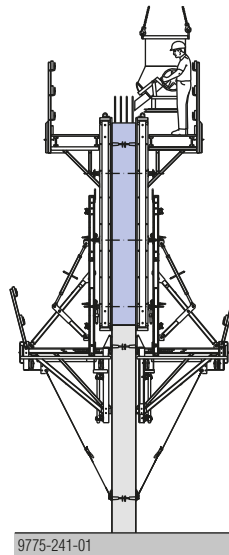
For more information, see the 'Framed formwork Framax Xlife' User Information booklet.

Schematic workflow of climbing phases

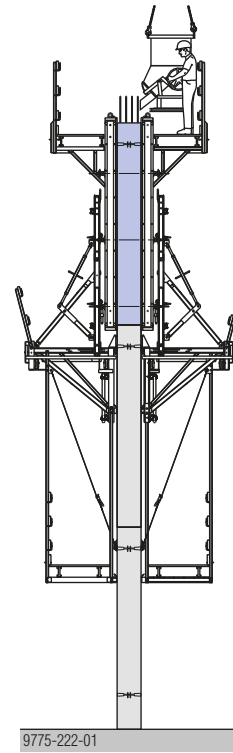
Start-up phases



The 1st casting section is poured without a climbing scaffold.

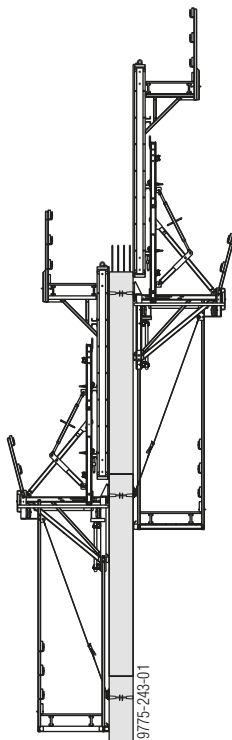


The 2nd casting section (and all further sections) are poured using the climbing scaffold.

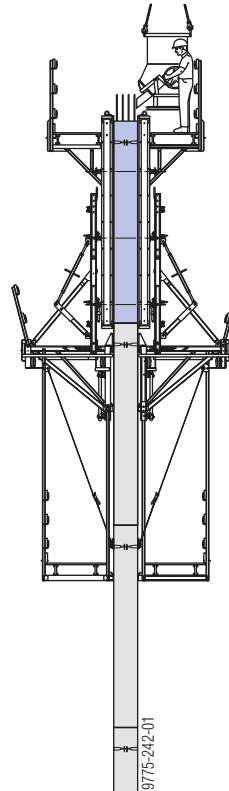


The suspended platforms are mounted, and then the 3rd section is poured.

Typical phases



The climbing scaffold is raised to the next casting section.



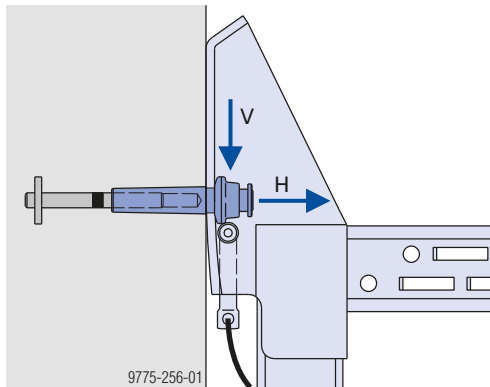
The next casting section is poured.

Structural design

Loading data

Anchoring on the structure

Imposed loads



V ... permitted vertical load: 35 kN
H ... permitted horizontal load: 65 kN

Dimensioning the suspension point

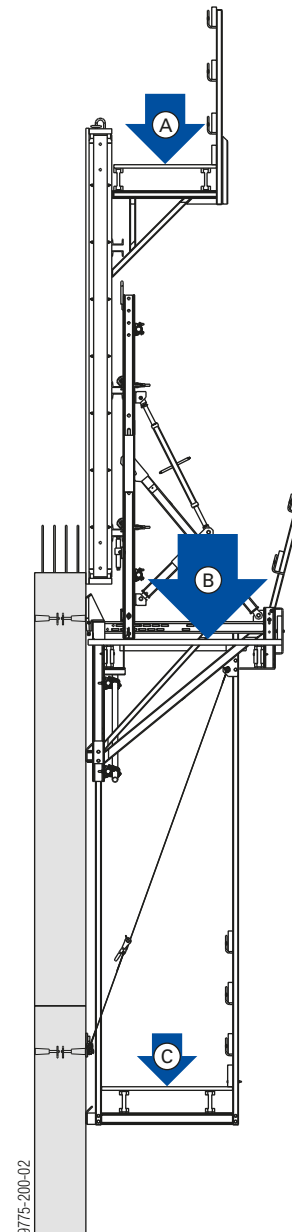
The required **cube compressive strength** of the concrete at the time of loading must be **specified** separately for each project **by the structural designer**. It will depend on the following factors:

- load actually occurring
- length of stop anchor or pigtail anchor
- reinforcement / extra reinforcement steel
- distance from edge

The introduction of the forces, the transfer of these forces into the structure, and the stability of the overall construction, must all be verified by the structural designer.

The required cube compressive strength $f_{ck, cube, current}$ must be at least 10 N/mm², however.

Service loads



A 150 kg/m²

B 300 kg/m²

C 75 kg/m²

Structural design



CAUTION

► If wind speeds > 72 km/h are likely, and when work finishes for the day or before prolonged work-breaks, always take extra precautions to fix the formwork in place.

Suitable precautions:

- set up the opposing formwork
- turn the screwjack mechanism until the formwork meets the top of the previously cast section, and knock the fixing-wedges into place

Wind pressure

- 1) Determine the wind pressure as a function of the wind speed, the building environment and the structure height.
- 2) Use the relevant diagram, (A) or (B) .

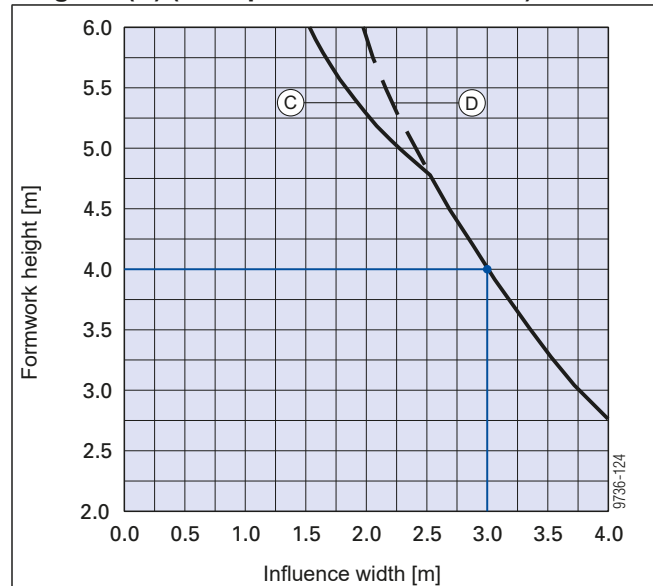
Diagram	Wind pressure [kN/m ²] $W_e = C_{p, net} \times Q(z_e)$	Example:
(A)	1.00	Where $c_{p, net} = 1.3$: Permissible wind speed = 126 km/h
(B)	1.365	Where $c_{p, net} = 1.3$: Permissible wind speed = 147 km/h



Follow the directions in the Calculation Guide "Wind loads to the Eurocodes" when determining the wind pressure or ask your Doka technician!

Influence width of climbing brackets

Diagram (A) (wind pressure = 1.00 kN/m²)

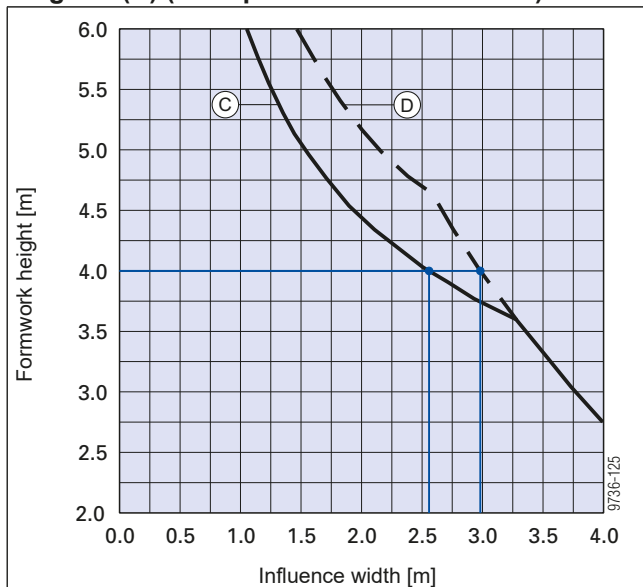


C Without Wind bracing MF/150F/K 6.00m

D With Wind bracing MF/150F/K 6.00m

Example

- Basic data:
 - Diagram (A) (wind pressure = 1.00 kN/m²)
 - formwork height: 4.00 m
- Influence width: 3.00 m

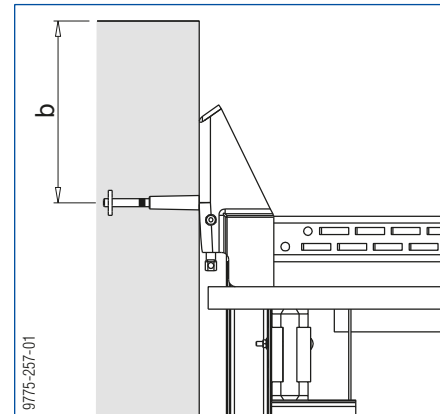
Diagram (B) (wind pressure = 1.365 kN/m²)**C** Without Wind bracing MF/150F/K 6.00m**D** With Wind bracing MF/150F/K 6.00m

Example

- Basic data:
 - Diagram **(B)** (wind pressure = 1.365 kN/m²)
 - formwork height: 4.00 m
- Influence width: 2.60 m (without "Wind bracing")
- Influence width: 2.95 m (with "Wind bracing")

Determining the influence width where the climbing cone is more than 400 mm below the top of the concrete

- When determining the influence width, add the difference ($b - 400$ mm) to the actual formwork height.



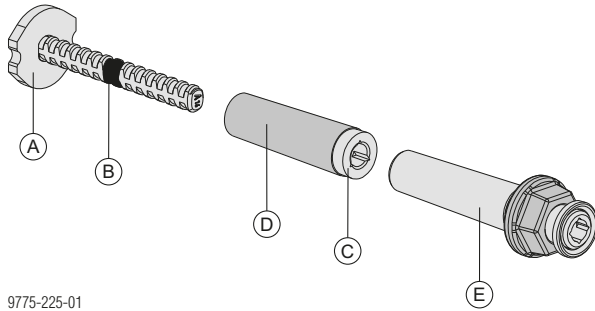
b ... min. 400 mm

Example

- Basic data:
 - Diagram **(B)** (wind pressure = 1.365 kN/m²)
 - formwork height: 4.00 m
 - distance between climbing cone and top of concrete b: 0.65 m
- Formwork height for determining the influence width: 4.00 m + (0.65 m - 0.40 m) = 4.25 m
- Influence width: 2.25 m

Anchoring on the structure

Positioning point and suspension point



9775-225-01

- A** Stop anchor 15.0 (expendable anchoring component)
- B** Depth mark
- C** Positioning cone 15.0 5cm
- D** Sealing sleeve 15.0 5cm (expendable anchoring component)
- E** Climbing cone 15.0 5cm

▪ Stop anchor

- Expendable anchoring component for anchoring the suspension cone (and thus the climbing unit) in the concrete from one side.

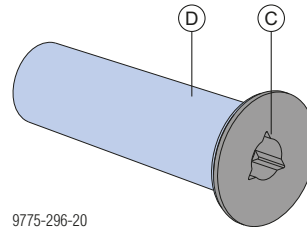
▪ Positioning cone

- Placeholder for the suspension cone on the positioning point.

▪ Climbing cone

- For safe suspension-mounting of the climbing unit.

Cantilever positioning cone 15.0 5cm



9775-296-20

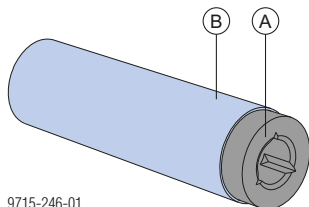
- C** Cantilever positioning cone 15.0 5cm
- D** Sealing sleeve S 15.0 5cm (orange)



NOTICE

Cantilever positioning cones 15.0 5cm are supplied together with Sealing sleeves S 15.0 5cm. Fit **new sealing sleeves every time the cones are re-used.**

Positioning cone 15.0 5cm



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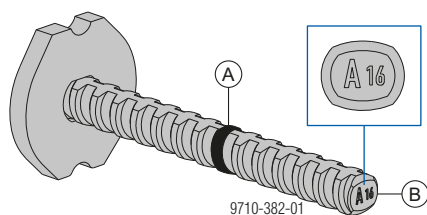
- A** Positioning cone 15.0 5cm
- B** Sealing sleeve 15.0 5cm (orange)



NOTICE

Positioning cones 15.0 5cm are supplied together with Sealing sleeves 15.0 5cm. Fit **new sealing sleeves every time the cones are re-used.**

Types of stop anchor



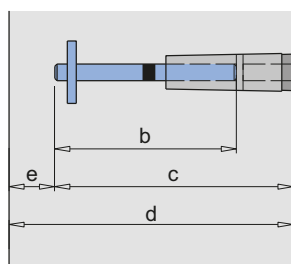
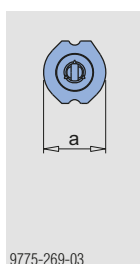
- A** Mark for screw-in depth
B Code for stop-anchor type



The stop anchor has an identification code on the end face.

- The code is a combination of a letter and a number and it unequivocally describes the features of the stop anchor:
 - Letter: Tie-rod size and size of the stop-anchor plate.
 - Number: Length of the stop anchor in cm
- Easy identification of the stop-anchor type before and after the concrete has been poured

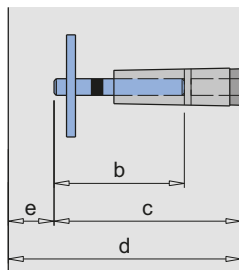
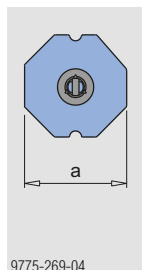
Stop anchor 15.0 A16



A	Stop anchor 15.0
16	a ... size of stop-anchor plate: 55 mm
	b ... tie-rod length: 16.0 cm

- c ... installation depth: 21.0 cm
 d ... Minimum wall thickness: 23.0 cm (where the concrete cover is 2 cm)
 d ... Minimum wall thickness: 24.0 cm (where the concrete cover is 3 cm)
 e ... concrete cover

Stop anchor 15.0 B11



B	Stop anchor 15.0
11	a ... size of stop-anchor plate: 90 mm
	b ... tie-rod length: 11.5 cm

- c ... installation depth: 16.5 cm
 d ... Minimum wall thickness: 19 cm (where the concrete cover is 2 cm)
 d ... Minimum wall thickness: 20 cm (where the concrete cover is 3 cm)
 e ... concrete cover



WARNING

The short **Stop anchor 15.0 B11** has a much lower load-bearing capacity than the Stop anchor 15.0 A16.

- ▶ The short stop anchor may only be used on systems with low tensile loads at the anchoring location, such as on climbing systems inside shafts.
- ▶ If the geometry will only allow installation of short stop anchors, then revised static calculations and/or extra reinforcement steel may be required where any higher tensile loads are expected.
- ▶ The Stop anchor 15.0 B11 is only permitted for wall thicknesses < 24 cm. For wall thicknesses ≥ 24 cm, the Stop anchor 15.0 A16 (or larger) must be used.



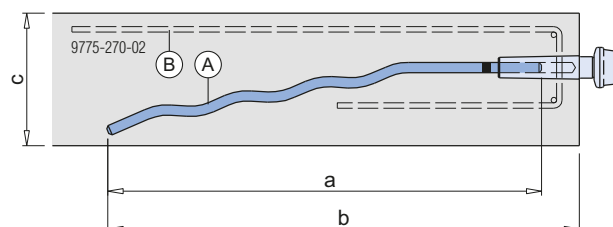
WARNING

The **Stop anchor 15.0 B11** may accidentally come unscrewed from the positioning cone while low-viscosity concrete is being poured.

- ▶ Take additional precautions to prevent the Stop anchor 15.0 B11 from being turned.

Pigtail anchor

It is also possible to use a **pigtail anchor** for a positioning point / suspension point in the floor-slab, instead of a stop anchor.



- a ... 64.0 cm
 b ... 69.0 cm
 c ... min. 16.0 cm

A Pigtail anchor 15.0

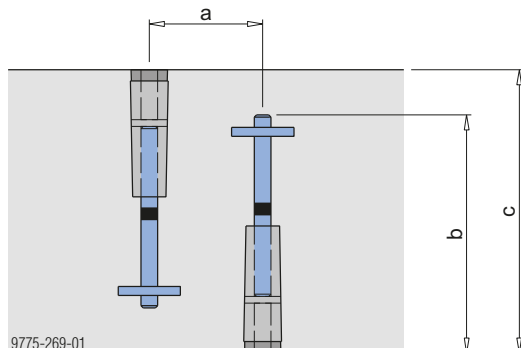
- B** Longitudinal reinforcement and U-reinforcements, min. diam. 8 mm, spaced max. 15 cm apart

Opposite anchoring points

Note:

If the wall thickness is less than twice the installation depth of the stop anchor, opposing anchor points must be offset to one another.

Plan view



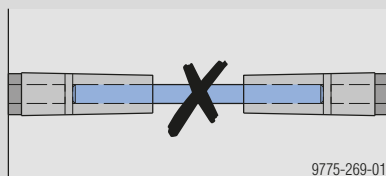
- a ... min. 100 mm, if $c < 2 \times b$
 b ... installation depth
 c ... wall thickness



If two cones are fitted opposite one another and joined with a tie rod there is a risk of formwork falling off.

Unscrewing the anchor on one side may cause the anchor on the opposite side to shear off.

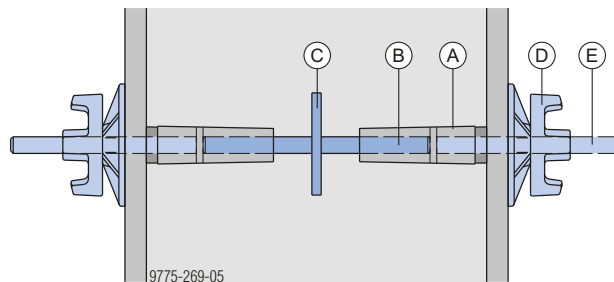
- Do not, under any circumstances, connect cones with a tie rod.



Anchor points with no offset

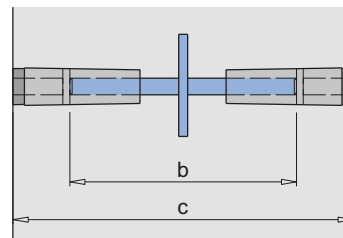
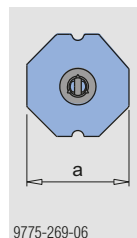
Anchor points with no offset are prepared using the **Stop anchor double-ended 15.0 K.**

Positioning point



- A** Positioning cone 15.0 5cm
- B** Sealing sleeve 15.0 5cm (expendable anchoring component)
- C** Stop anchor double-ended 15.0 (expendable anchoring component)
- D** Super plate 15.0
- E** Tie rod 15.0mm

Stop anchor double-ended 15.0 K..



K	Stop anchor 15.0
	a ... size of stop-anchor plate: 90 mm
25 - 70	b ... tie-rod length: 25 - 70 cm

b ... 25 - 70 cm

c ... order length = wall thickness a - 10 cm



WARNING

In walls that are less than 39 cm thick, the Stop anchor double-ended 15.0 K.. has a much lower load-bearing capacity than the Stop anchor 15.0 A16.

- Revised static calculations are required here.
- Where high tensile forces occur, locate extra reinforcement steel as statically required.

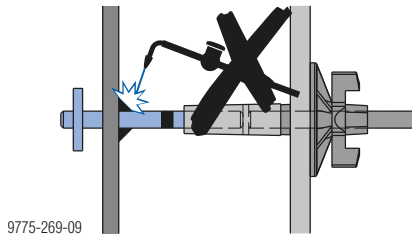
Preparing the positioning point



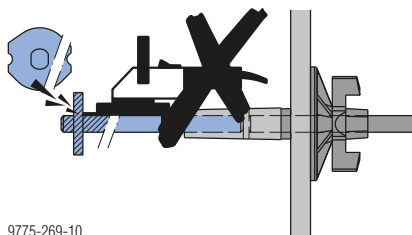
WARNING

Sensitive anchoring, suspension and connector components!

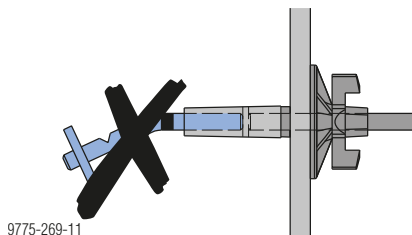
- Never weld or heat these components.
- Any components that are damaged or weakened by corrosion or wear must be withdrawn from use.



9775-269-09



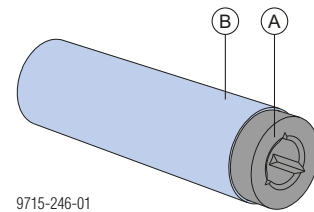
9775-269-10



9775-269-11

Preparing the positioning point

- Push the sealing sleeve all the way onto the positioning cone.



9715-246-01

A Positioning cone 15.0 5cm

B Sealing sleeve 15.0 5cm (orange)

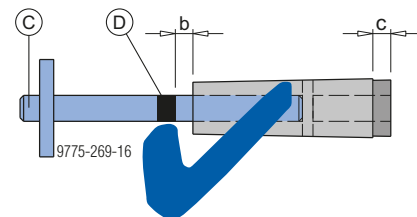
Note:

Do not screw the stop anchor in until the sealing sleeve is pushed fully on to the positioning cone.



WARNING

- Always screw the stop anchor into the positioning cone until it fully engages. Not screwing the stop anchor fully into the cone may lead to reduced load-bearing capacity and failure of the suspension point – resulting in possible injury and/or damage.



9775-269-16

b ... 10 mm

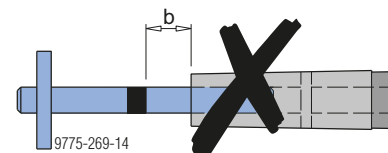
c ... 10 mm

C Stop anchor 15.0 (expendable anchoring component)

D Depth mark



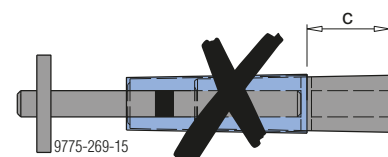
- Always screw in components until they are fully engaged. When correctly fitted, there will still be 10 mm of thread visible between the part and the depth mark on the stop anchor or pigtail anchor.



9775-269-14

b ... > 10 mm not permitted

- The sealing sleeve must be completely pushed onto the positioning cone.



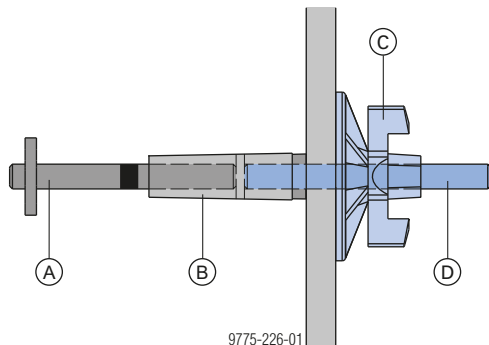
9775-269-15

c ... > 10 mm not permitted

Positioning point with Positioning cone 15.0 5cm (with hole drilled through form-ply)

Installation:

- ▶ Drill a diam. 18 mm hole in the form-ply (position as shown in shop drawing / assembly plan).
- ▶ Insert a Tie rod 15.0 (length approx. 20 cm) through the hole drilled in the form-ply, screw it into the positioning cone and tighten it with a Super plate 15.0.



A Stop anchor 15.0

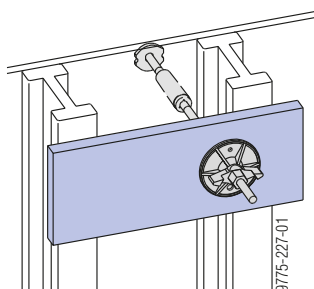
B Positioning cone 15.0 5cm + Sealing sleeve 15.0 5cm

C Super plate 15.0

D Tie rod 15.0mm

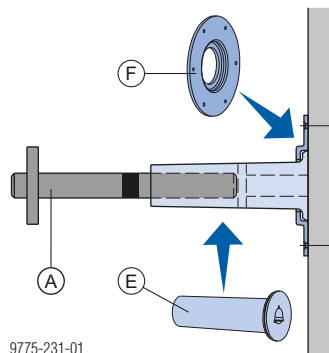


If the positioning point is located too close to a Doka beam, a board can be nailed to this and the adjoining beam to provide a support surface for the super plate.



Positioning point with Cantilever positioning cone 15.0 5cm (with no hole drilled through form-ply)

For special applications only, when it is not possible to drill through the form-ply (e.g. where there are Doka beams or formwork panel frame profiles directly behind the positioning point).



A Stop anchor 15.0

E Cantilever positioning cone 15.0 5cm + Sealing sleeve S 15.0 5cm

F Fixing plate 15.0



NOTICE

It is not permitted to use the Fixing plate 15.0 more than once in the same position, as it cannot be fixed firmly and securely in the old nail-holes.

Installation:

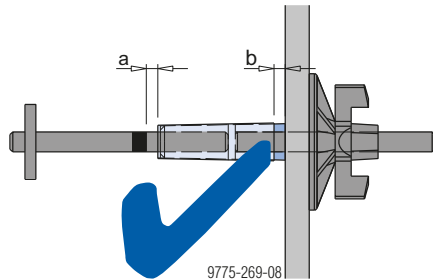
- ▶ Nail a cantilever positioning cone to the form-ply using a Fixing plate 15.0 (position as shown in project plan).

Check of the positioning point

- Before pouring, check all positioning points and suspension points again.



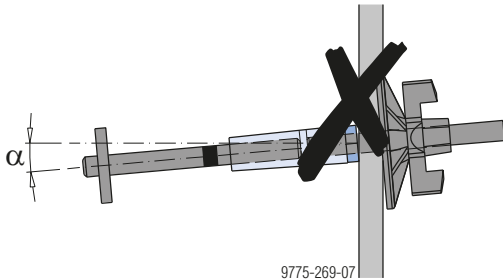
- The sealing sleeve must be completely pushed onto the positioning cone.
- Always screw in components until they are fully engaged. When correctly fitted, there will still be 10 mm of thread visible between the part and the depth mark on the stop anchor or pigtail anchor.
- Tolerance for locating the positioning points and suspension points: ± 10 mm in the horizontal and the vertical.



a ... 10 mm
b ... 10 mm



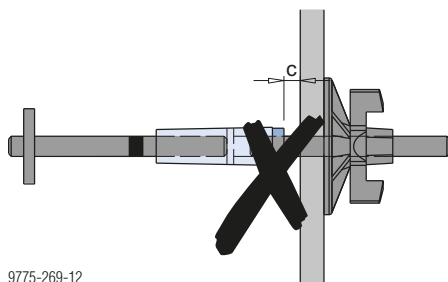
- The axis of the positioning cone must be at right-angles to the surface of the concrete – maximum angle of deviation 2° .



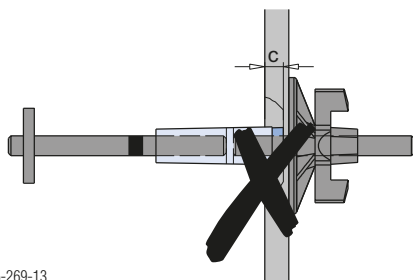
α ... max. 2°



- The positioning cone must be embedded so that it is flush with the concrete surface.



9775-269-12



9775-269-13

c ... > 0 mm not permitted

Pouring



Mark the positions of the anchoring points at the top edge of the formwork to make them easier to locate when the concrete is being poured.

- Prevent the vibrator from touching the stop anchors.
- Do not place concrete from directly above the stop anchors.

These measures prevent the anchors from working loose during pouring and vibration.

Stripping the formwork

Remove the connecting parts holding the positioning point to the formwork either before or after stripping, depending on which connecting parts are used.

Positioning point with Positioning cone 15.0 5cm:

- Remove the Super plate 15.0 before stripping the formwork.
- Unscrew the Tie rod 15.0.

Preparing the suspension point

Dimensioning the suspension point

The required **cube compressive strength** of the concrete at the time of loading must be **specified** separately for each project **by the structural designer**. It will depend on the following factors:

- load actually occurring
- length of stop anchor or pigtail anchor
- reinforcement / extra reinforcement steel
- distance from edge

The introduction of the forces, the transfer of these forces into the structure, and the stability of the overall construction, must all be verified by the structural designer.

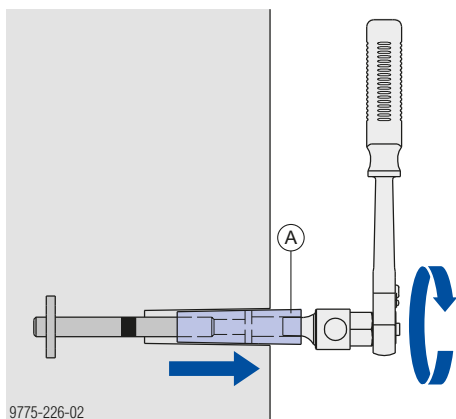
The required cube compressive strength $f_{ck, cube, current}$ must be at least 10 N/mm², however.



Follow the directions in the Calculation Guide entitled "Load-bearing capacity of anchorages in concrete" or ask your Doka technician!

Engaging the climbing bracket

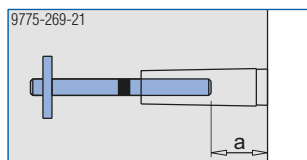
- Unscrew the positioning cone, using a Reversible ratchet 1/2" and a Positioning-cone spanner 15.0 DK.



A Positioning cone 15.0 5cm

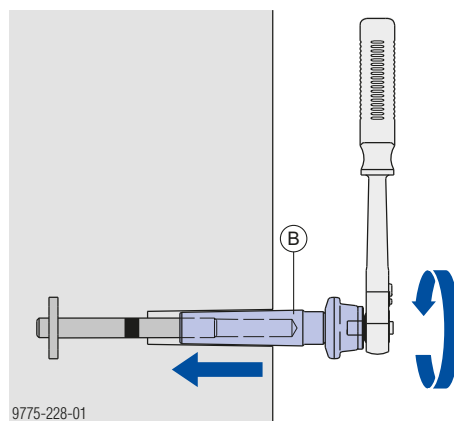
Check of the positioning point

- Check the code on the stop anchor.
- Check the placement depth of the stop anchor.



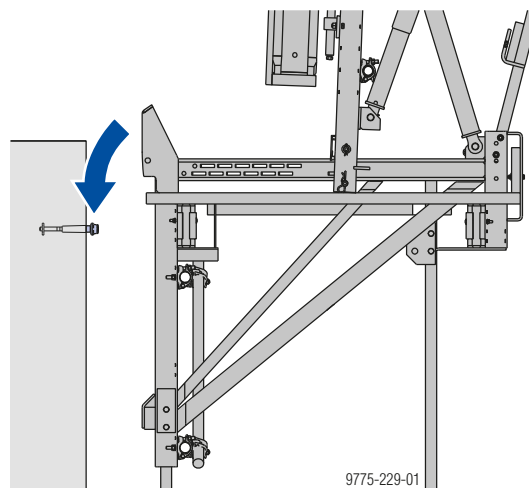
a ... placement depth: 50 mm

- Screw in the climbing cone until this is fully engaged, and tighten it with a Reversible ratchet 1/2".

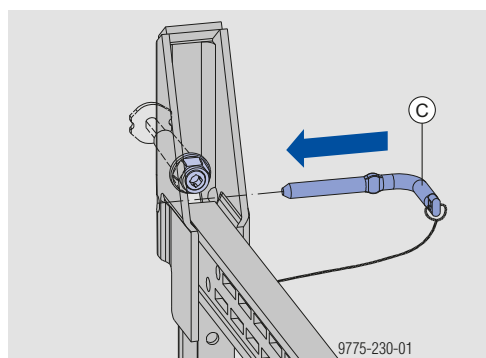


B Climbing cone 15.0 5cm

- Suspend the climbing formwork from the climbing cones.

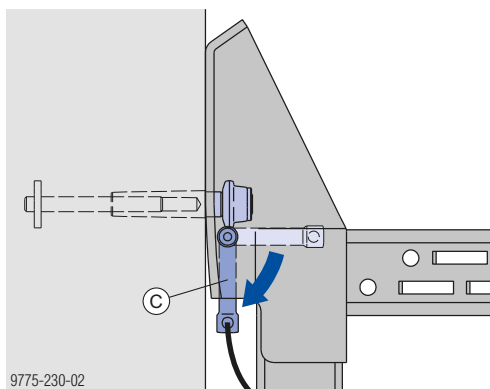


- Insert the fastening pin with its handle in the horizontal



C Fastening pin

- Tilt the fastening pin downward.



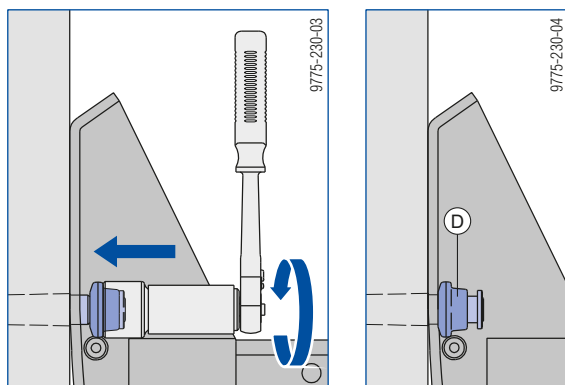
C Fastening pin

The climbing bracket is now secured against accidental lift-out.



The fastening pin must be pointing vertically downward!

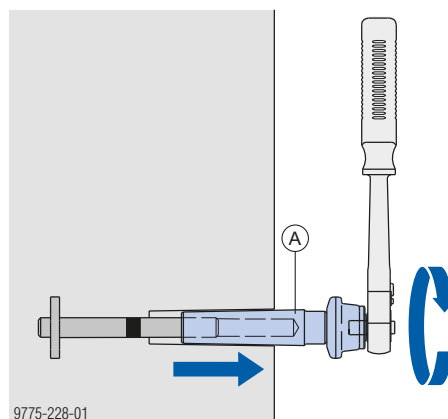
- Tighten the fixing-nuts of the climbing cones using a Reversible ratchet 1/2" and Box spanner 41.



D Fixing nut

Dismounting the suspension point

- Unscrew the climbing cone with a Reversible ratchet 1/2".



A Climbing cone 15.0 5cm

Sealing the suspension point

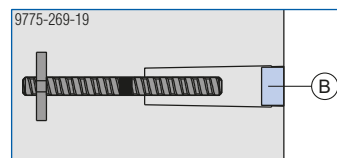
Grout level with the rest of the surface

Sealing of the suspension points can be a requirement, for reasons of rust prevention.

- Fill the cavity of the suspension point with mortar and grout it smoothly.

Fibre concrete plugs

- Remove the sealing sleeve.
- Glue the fibre concrete plug into the hole of the suspension point.



B Fibre concrete plug 30.7mm

The concrete plug is glued into place with standard concrete adhesive.

Other possible anchorages

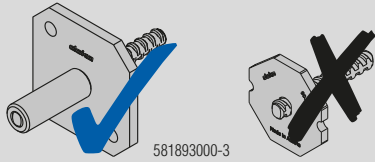
Thin walls

Wall thicknesses of 15 to 16 cm are prepared using the **Wall anchor 15.0 15cm**.

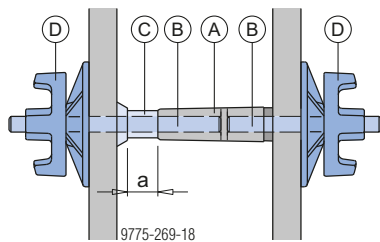


Risk of confusion!

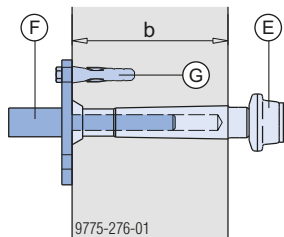
▶ NEVER use Stop anchors 15.0 for this application.



Positioning point



Suspension point



a ... length of plastic tube 3 - 4 cm

b ... 15 - 16 cm

A Positioning cone 15.0 0.5cm + Sealing sleeve 15.0 5cm

B Tie rod 15.0mm

C Universal cone 22mm + Plastic tube 22mm

D Super plate 15.0

E Climbing cone 15.0 5cm

F Wall anchor 15.0 15cm

G Hexagon timber screw 10x50 + dowel Ø12

Retrofitting a safe suspension point

Dimensioning the suspension point

The required **cube compressive strength** of the concrete and ready-mix mortar at the time of loading must be **specified** separately for each project **by the structural designer**. It will depend on the following factors:

- load actually occurring
- wall thickness
- reinforcement / extra reinforcement steel
- distance from edge

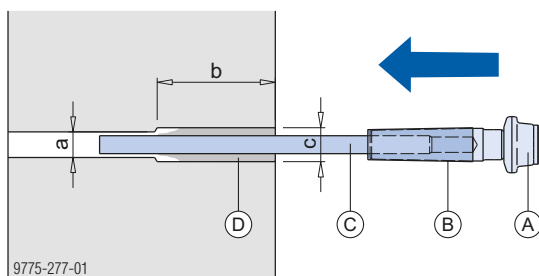
The introduction of the forces, the transfer of these forces into the structure, and the stability of the overall construction, must all be verified by the structural designer.

The required cube compressive strength $f_{ck, cube, current}$ must be at least 10 N/mm², however.

Drilling a hole for the suspension point through the wall

e.g.: if the crew forgot to prepare a positioning point.

- Drill a hole of diam. 35 mm and 115 mm depth.
- Drill a hole of diam. 25 mm.
- Push the sealing sleeve all the way onto the suspension cone.
- Screw the tie rod into the suspension cone until fully engaged, and put the rod part-way into the hole.
- Put the unit part-way into the borehole.
- Paste the ready-mix mortar (supplied by site) into the drilled hole with a spatula



- a ... 25 mm
- b ... 115 mm
- c ... 35 mm

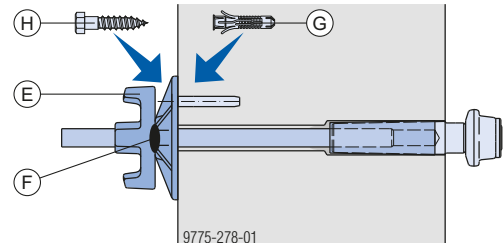
- A** Climbing cone 15.0 5cm
- B** Sealing sleeve 15.0 5cm
- C** Tie rod 15.0mm
- D** Ready-mix mortar

- Insert the unit so that it is flush with the concrete surface.
- Scrap away the excess ready-mix mortar with a spatula.



NOTICE

- Weld a bead to the super plate to join the nut and the plate. Do this **BEFORE** screwing the super plate onto the tie rod.
- On the other side of the concrete wall, screw on the super plate (now welded together) and secure it with a screw and dowel so that it cannot be unscrewed.

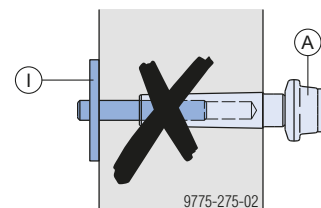


- E** Super plate 15.0
- F** Weld-seam
- G** Dowel Ø12
- H** Hexagon timber screw 10x50

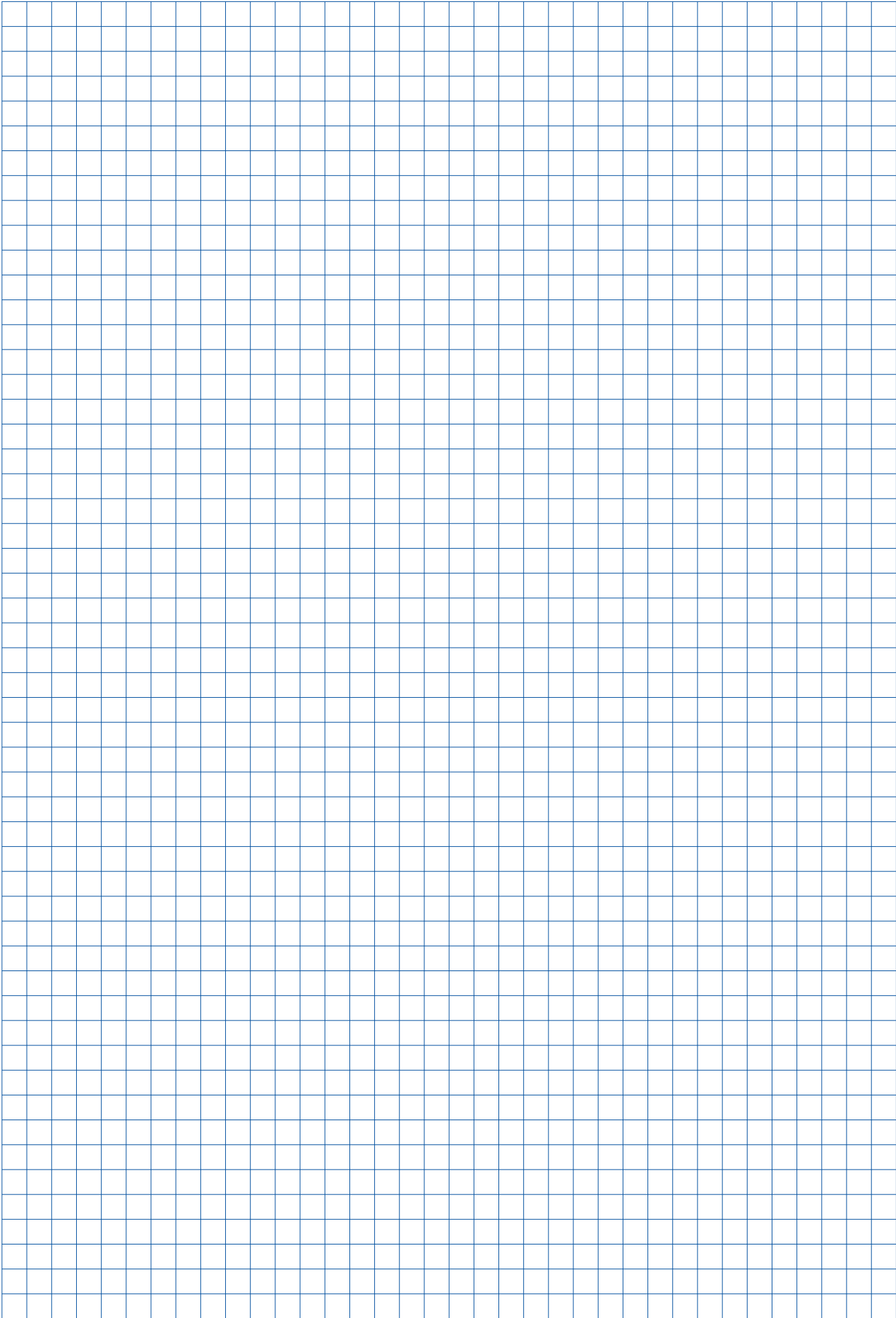


WARNING

- Do **NOT** fit stop anchors with the anchor plate exposed! The anchor plate must always be embedded in the concrete.



- A** Climbing cone 15.0 5cm
- I** Stop anchor



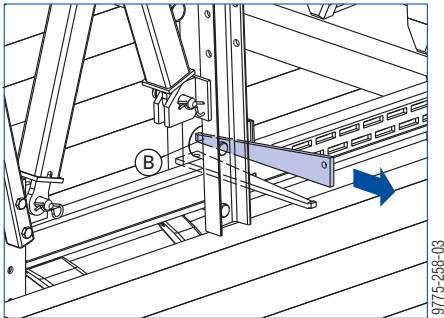
Operating the formwork

Closing the formwork

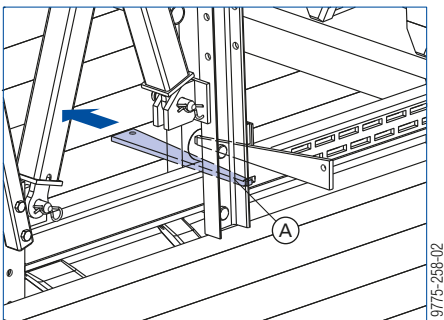


This section only deals with how to operate the formwork. For details of how to tie the formwork, please see the User Information book-lets 'Large-area formwork Top 50' or 'Framed formwork Framax Xlife'.

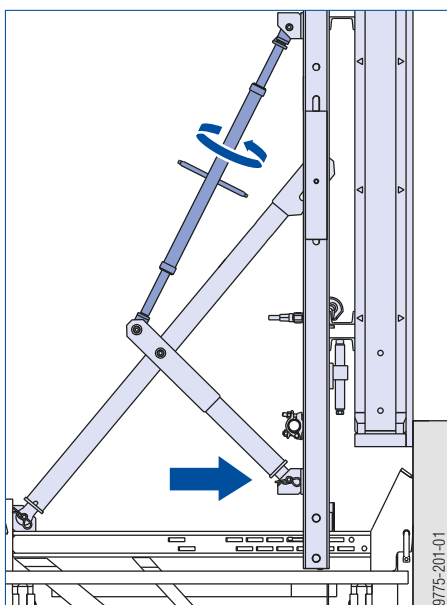
- Detach the fixing-wedges (B) .



- Release the pressure wedge (A) .

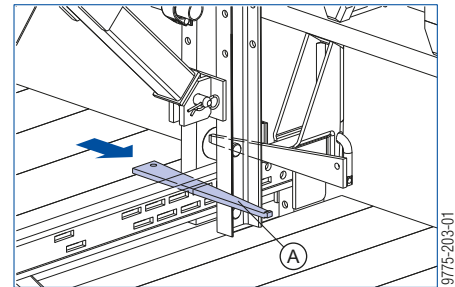


- Turn the screwjack mechanism of the scissor-action spindle to move the formwork forward until it meets the top of the previously cast section.



- Adjust the formwork and level the positioning points. See the section headed "Plumbing & aligning".

- After adjusting the formwork elements, tighten the pressure wedges (A) .



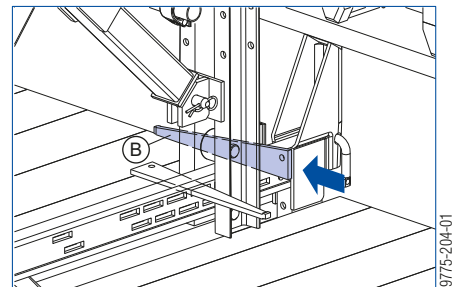
This presses the formwork element up against the previously cast section.



NOTICE

It only takes a gentle blow of the hammer to fix the pressure wedge! The concrete loads are sustained by way of the form-ties and are not transferred via the wedge.

- Knock the fixing-wedges (B) into place.



This fixes the Vertical waling to the Climbing bracket.

Possible incorrect usages



NOTICE

Improper handling and use of the formwork equipment can lead to hazardous situations. These must be prevented under all circumstances.



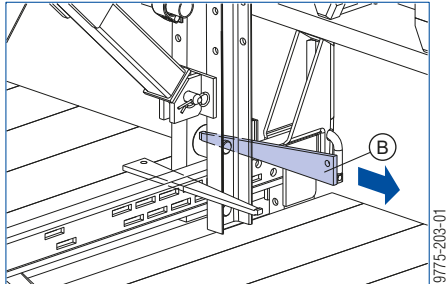
WARNING

No additional forces are to be transferred into the formwork:

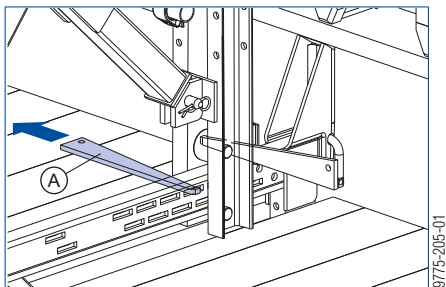
- Do not use hoists or other such devices for positioning and adjusting the formwork.
- Do not use the formwork to force incorrectly placed reinforcement steel into position.
- Always press the formwork against the concrete without applying force. Do not use any additional devices (such as extra screwjack mechanisms) on the Travelling gear.
- Never use 'brute force' on the adjusting spindles (e.g. with tube-extensions).

Opening the formwork

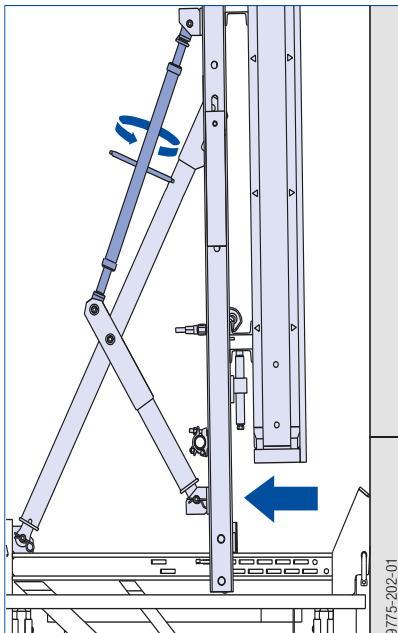
- ▶ Undo and remove the form-ties of the formwork element.
- ▶ Remove the connectors from the adjacent gang-forms.
- ▶ Detach the fixing-wedges (B) .



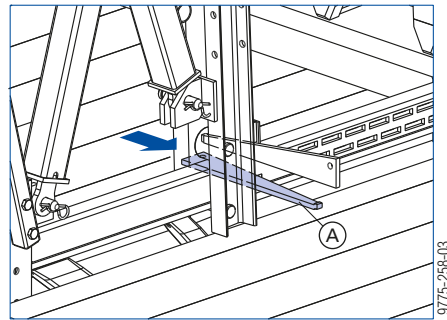
- ▶ Release the pressure wedge (A) .



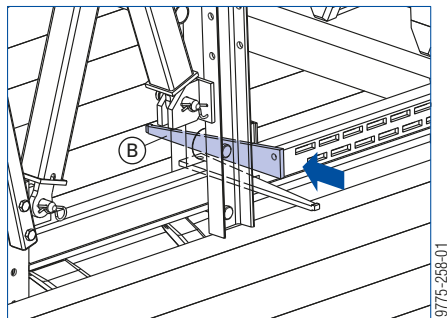
- ▶ Roll back the formwork all the way by turning the screwjack mechanism of the scissor-action spindle.



- ▶ Tighten the pressure wedges (A) .



- ▶ Knock the fixing-wedges (B) into place.



This fixes the Vertical waling to the Climbing bracket.



NOTICE

The fixing-wedge may only be released while the formwork is being retracted forward or back!

Final position: fixing-wedges knocked back into place (wind bracing).

Plumbing & aligning the formwork

Adjusting the formwork

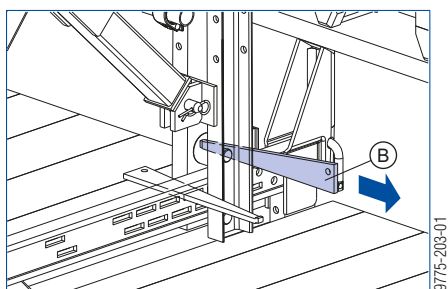
In order to permit exact adjustment of the formwork elements in relation to one another and to the structure, they are adjustable in both the vertical and the horizontal.

Tools needed:

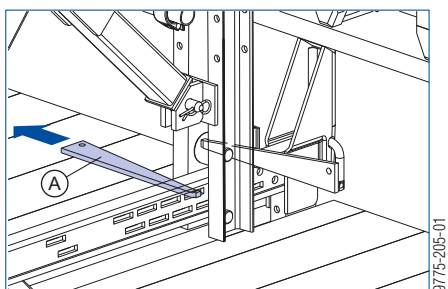
- Hammer
- Reversible ratchet 1/2"
- Box nut 24 1/2" and
- Fork wrench 22/24 (for the threaded joins on the adjusting spindles)

Preparing the adjusting operation

- Detach the fixing-wedges (**B**) .

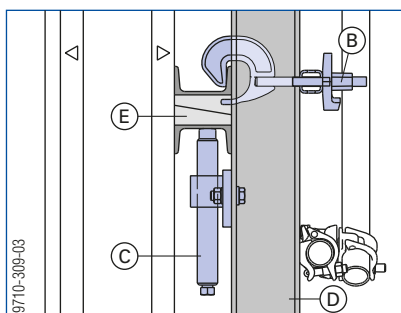


- Release the pressure wedge (**A**) .



- Detach the formwork from the concrete.
- Loosen the **Waling-to-bracket holders (B)** with a blow of the hammer.

The **adjusting spindles (C)** permit a vertical adjustment range of approx. 150 mm. Also, the adjusting spindles can be relocated in the hole-grid of the Vertical waling (**D**) .



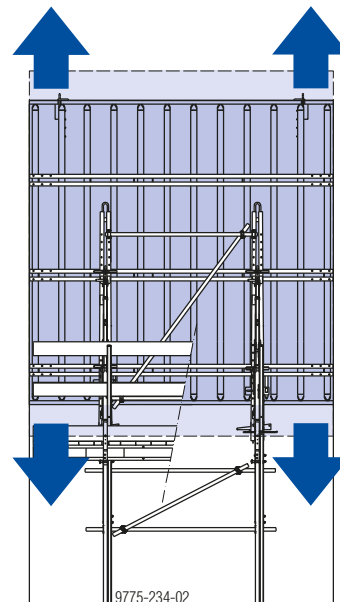
E Timber wedges in the multi-purpose walings (near the adjusting spindles – for ensuring better load transfer)

Vertical adjustment

- Turn both adjusting spindles.

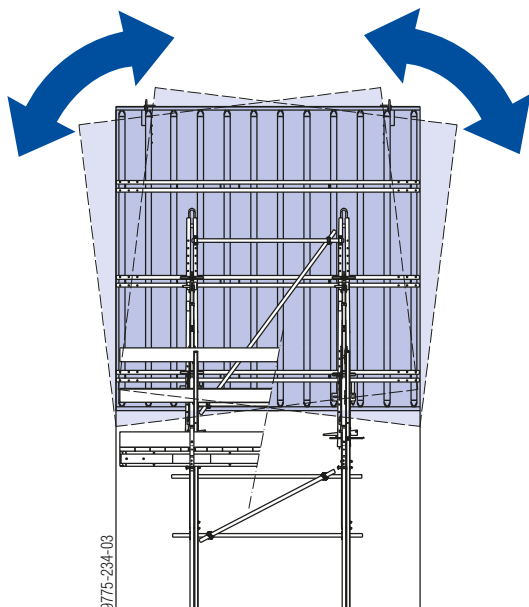


While adjusting the height, watch the waling-to-bracket holders to make sure that they do not jam and block the adjustment process.



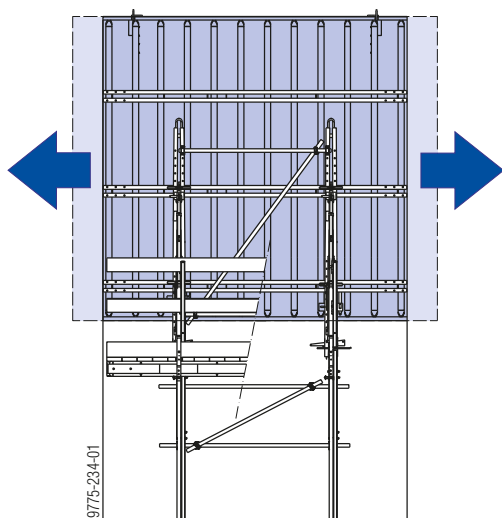
Side angle adjustment

- Only turn one adjusting spindle.



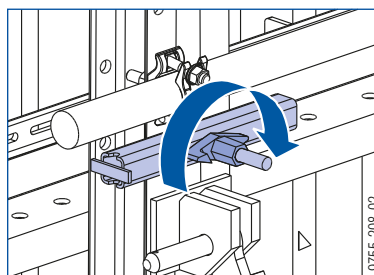
Horizontal adjustment

- Push the formwork to either side.

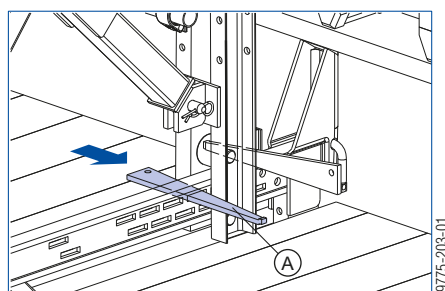


Ending the adjusting operation

- Tighten the waling-to-bracket holders with a hammer.



- After adjusting the formwork panels, tighten the pressure wedges (A).



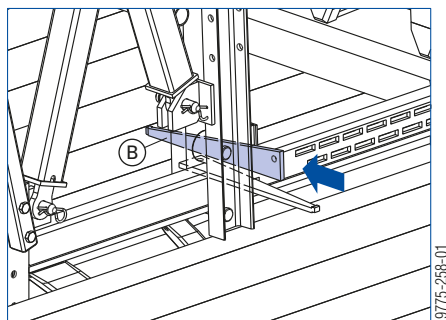
This presses the formwork panel up against the previously poured section.



NOTICE

It only takes a gentle blow of the hammer to fix the pressure wedge! The concrete loads are taken by the form ties, not by the wedge.

- Knock the fixing-wedges (B) into place.



This fixes the vertical waling to the climbing bracket.

Repositioning

Lifting by crane

Instructions for safe repositioning of the complete unit



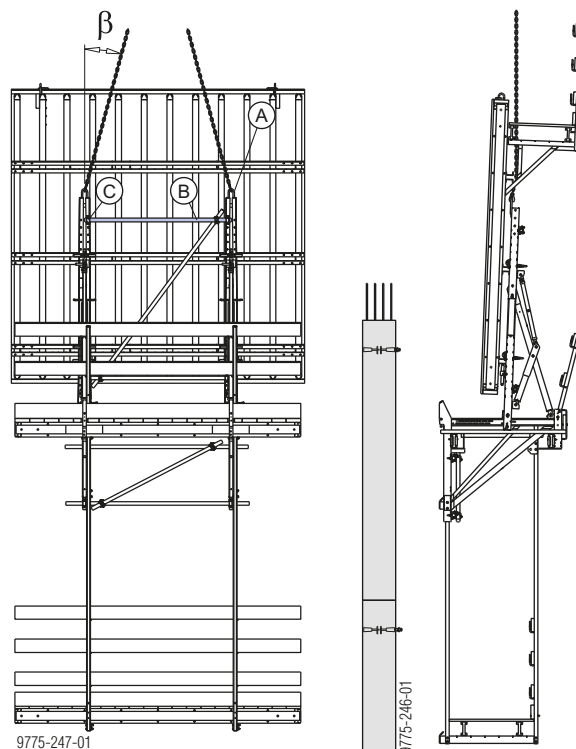
NOTICE

- **Before repositioning:** Remove any loose items from the formwork and platforms, or secure them firmly.
- 'Passenger transportation' is forbidden!
- Observe all regulations applying to the operation of cranes where higher wind speeds are experienced.
- Spread angle β : max. 30°
- Brace the vertical waling sufficiently **against oblique pull**.
- **Tightening torque of couplers: 50 Nm**
- When using lifting beams, ensure that these have sufficient load-bearing capacity!



Length of chain = at least the space between the hoisting points

This automatically leads to the required spread angle β .



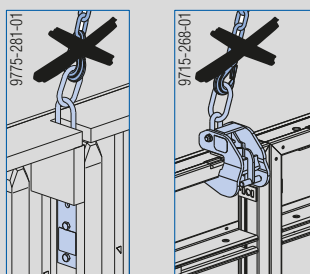
β ... max. 30°

- A** Lifting bracket of the vertical waling
- B** Bracing against oblique pull (e.g. scaffold tube)
- C** Screw-on coupler

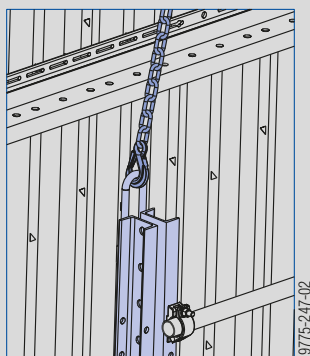


WARNING

- Any **lifting brackets** on the formwork panels, or **Framax lifting hooks**, must **not** be used for lifting the unit as a whole.



- Attach the lifting chains to the lifting brackets of the vertical waling.



Max. load-bearing capacity:

3500 kg per lifting bracket of the vertical waling

Required number of braces against oblique pull:

Total weight of unit to be lifted	Number of braces (e.g. scaffold tubes)
up to 2000 kg	1
up to 3500 kg	2

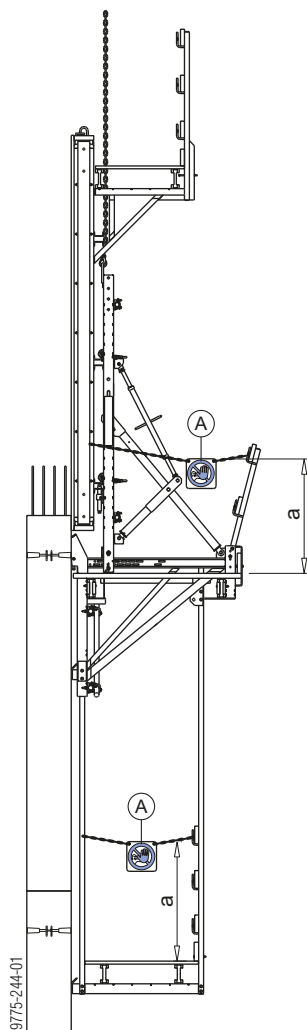
The suspension methods shown above are only needed for assembling and dismantling the formwork panels.

**NOTICE**

- When a climbing unit is repositioned, this opens up exposed fall-hazard locations on the remaining sections. These exposed locations must be made safe by putting up an access prohibition barrier. This access prohibition barrier must be fixed at least 2.0 m before the drop-off edge.

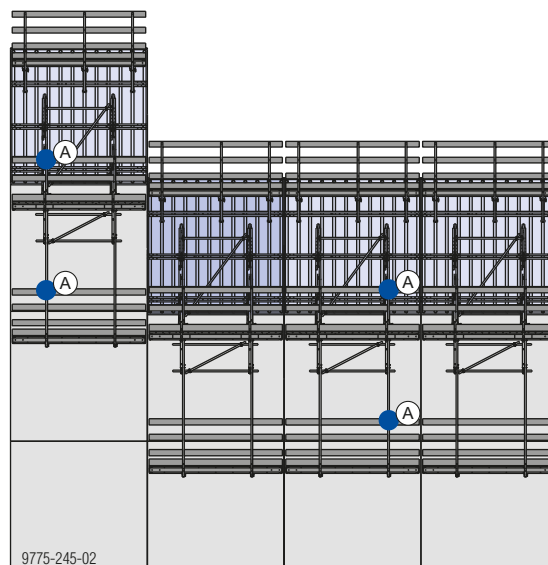


- The personnel in charge of the repositioning operation are responsible for positioning the access prohibition barriers correctly.
- During the lifting/repositioning cycle, no site personnel are allowed to be on the units to be climbed, or on adjacent units for repositioning.
- The persons operating the climbing formwork must use personal fall-arrest systems to prevent falls during the lifting operation.

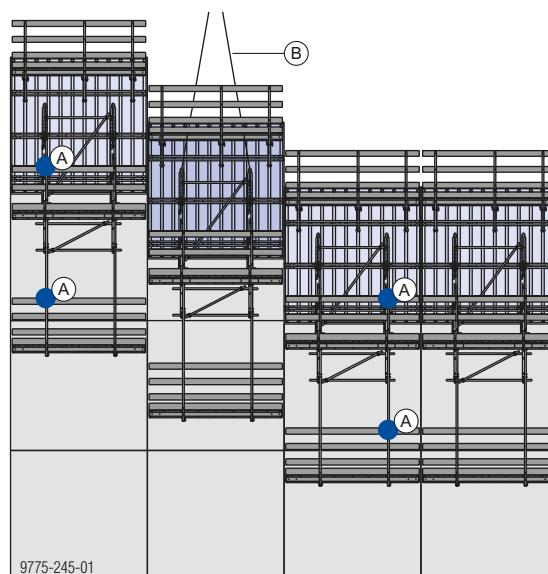
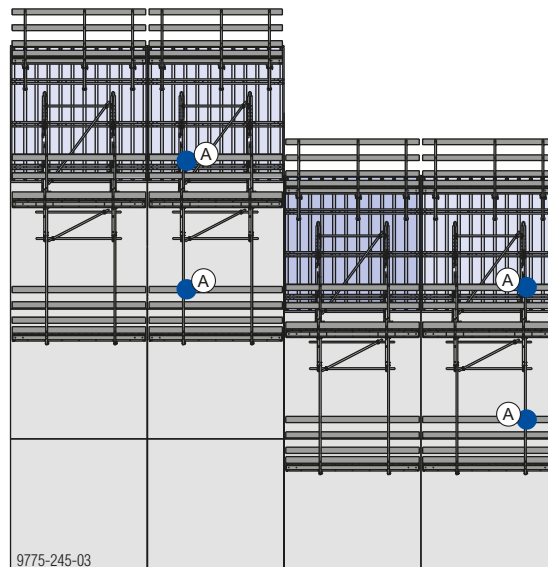


a ... 1.00 - 1.20 m

A Warning sign 'No entry' 300x300mm

Initial situation

Hoist the unit to be repositioned up to the next section.

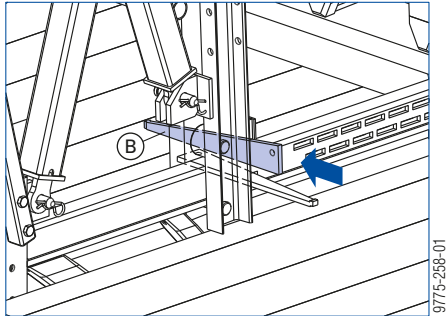
**Horizontal repositioning of the prohibition barriers**

A Warning sign 'No entry' 300x300mm

B Crane lifting tackle

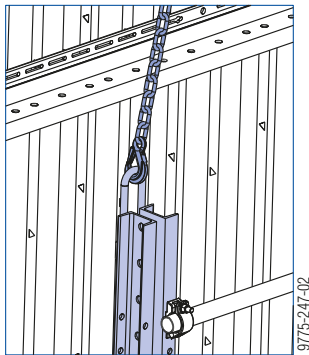
Repositioning the entire unit

- Prepare the suspension points.
- Dismount the 'Wind bracing'.
- Manoeuvre the formwork into the centre-of-gravity position.
- Knock the fixing-wedges (B) into place.



Before every lifting operation, check to make sure that all bolted connections have been secured, and that the fixing-wedges of the traveller units have been firmly driven in!

- Attach the lifting chain to the lifting-brackets of the Vertical waling.



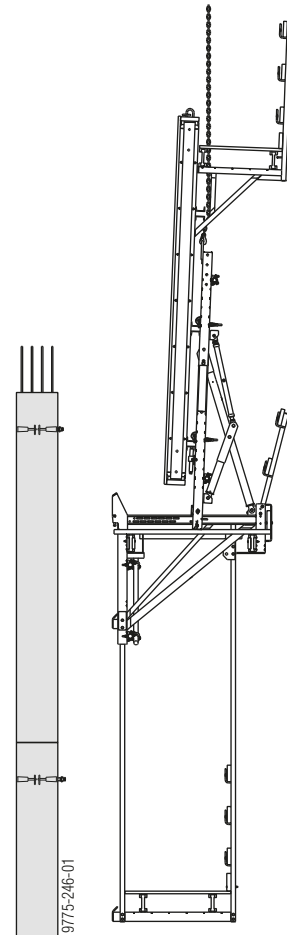
- Remove the fastening bolts (= lift-out guard) from the suspension points.



NOTICE

- When loosening the fixing-nuts, take care not to undo the climbing cone itself.
- Loosen the fixing-nuts of the climbing cones using a Reversible ratchet 1/2" and Box spanner 41.

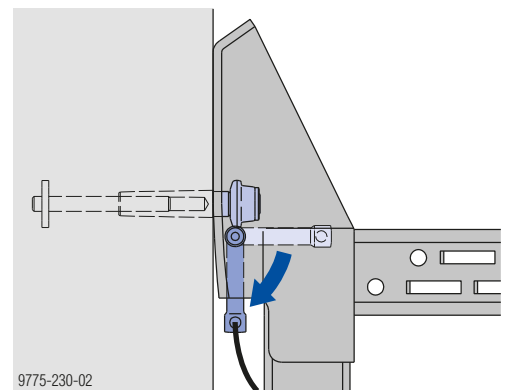
- Lift the entire unit by crane and hang it into place in the suspension point.



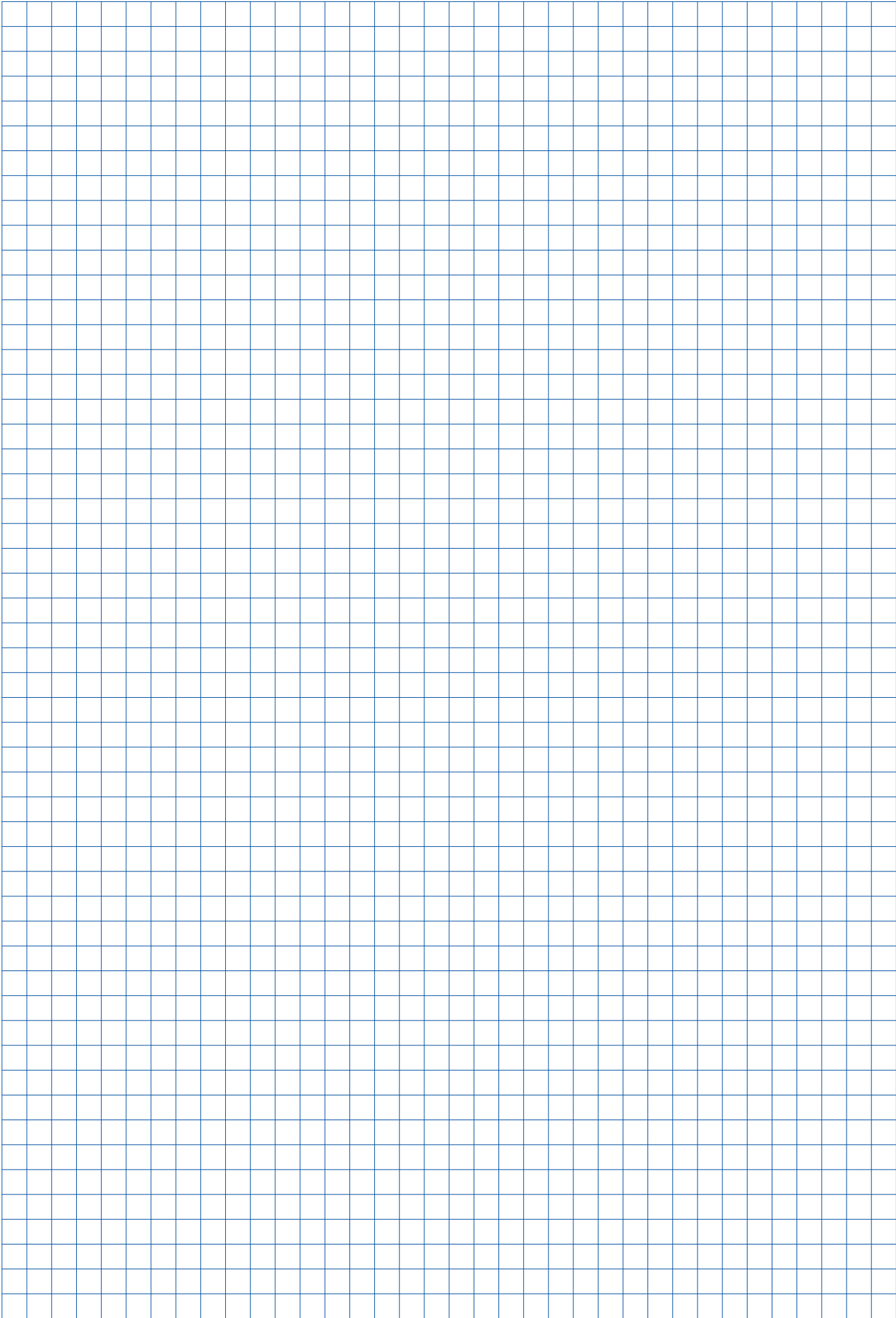
- Secure the climbing formwork to the suspension points with fastening bolts.



The fastening bolt must be pointing vertically downward!



- Tighten the fixing-nuts of the climbing cones using a Reversible ratchet 1/2" and Box spanner 41.
- If necessary, mount a "Wind bracing".



Operating the climbing formwork

Starting up

The modular design of the Climbing formwork 150F system means that many different combinations are possible.

Depending on the project, the actual design may differ significantly from that described here.

- ▶ In these cases, you should discuss the assembly procedure with your Doka technician.
- ▶ Follow the shop drawing / assembly plan.



NOTICE

- There must be a flat, firm base capable of supporting the load.
- Prepare a sufficiently large assembly area.
- Tightening torque of the bracing tube couplers: 50 Nm

Note:

In order to explain the entire climbing workflow as simply as possible, the repetitive actions involved are described in detail in separate sections of this booklet. The sections in question are:

- Preparing the positioning points and suspension points (see the section headed 'Anchoring on the structure').
- Closing the formwork (see the section headed 'Closing the formwork').
- Stripping (see the section headed 'Opening the formwork').
- In addition, the following sections must also be observed:
 - Plumbing and aligning the formwork
 - Repositioning by crane



For instructions on tying and joining the formwork elements, and on cleaning them and using concrete release agents, see the User Information booklets 'Large-area formwork Top50' and 'Framed formwork Framax Xlife'.



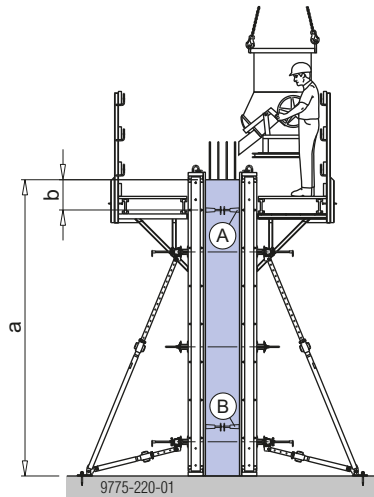
WARNING

Falling hazard!

- ▶ Do not step onto the pouring platforms until the formwork is securely closed up.

1st casting section

- Apply concrete release agent and set up one side of the formwork.
- Mount the positioning points.
- If necessary, mount positioning-points for a "Wind bracing".
- Place the reinforcement.
- Close the formwork and tie it.
- Pour the 1st section.



a ... height of casting section
b ... project-specific

A Positioning point

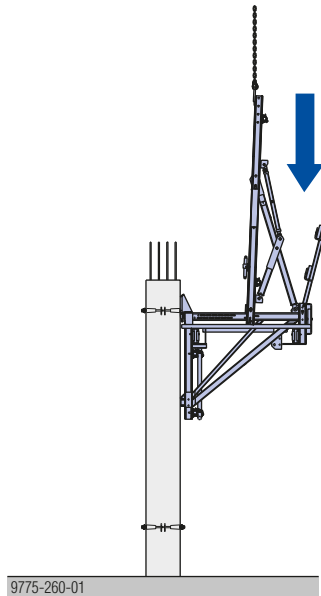
B Positioning point for wind bracing

- Strike the formwork.
- Clean the formwork.
- Set the gang-form down on a flat surface, with the form-ply facing downwards.
- Prepare the formwork for the climbing operation.

2nd casting section

Hanging the working platform into place on the suspension points:

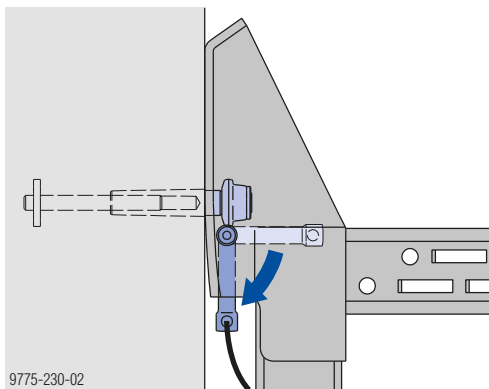
- Prepare the suspension points.
- Raise the prepared working platform with the crane lifting tackle and hook it into the suspension points.



- Secure the working platform with fastening pins.



The fastening pin must be pointing vertically downward!

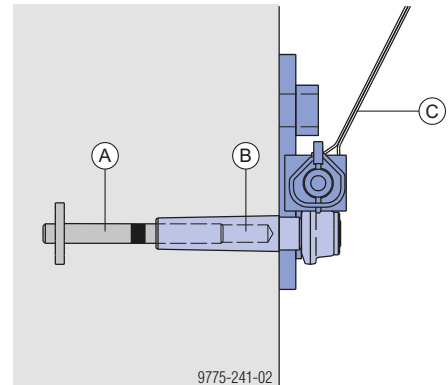


- Tighten the fixing-nuts of the climbing cones using a Reversible ratchet 1/2" and Box spanner 41.

Wind bracing (if necessary):

- Attach a Wind bracing MF/150F/K 6.00m to the Climbing bracket 150 F with a d25/151 head bolt and a linch pin.

- Fasten the tensioning unit of the Wind bracing MF/150F/K 6.00m to the structure, i.e. to the positioning point prepared with a climbing cone.



- A Stop anchor 15.0
- B Climbing cone 15.0 5cm
- C Wind bracing MF/150F/K 6.00m

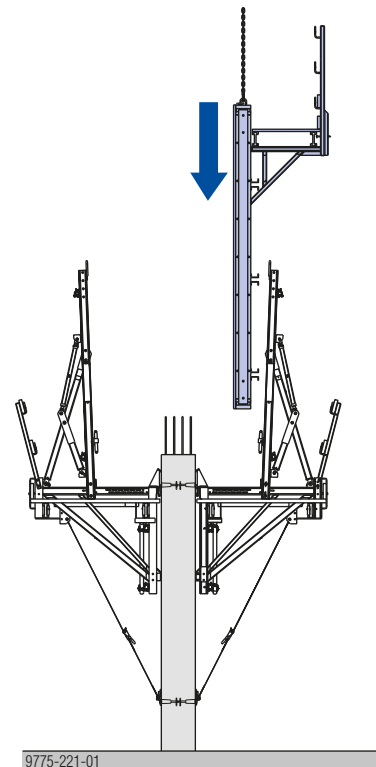
- Tighten the Wind bracing MF/150F/K 6.00m.

Wind bracing MF/150F/K 6.00m
Permitted tensile force: 25 kN

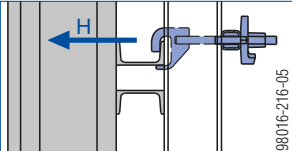
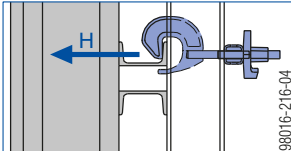
Wind bracing MF 6.00m
Permitted tensile force: 15 kN

Formwork:

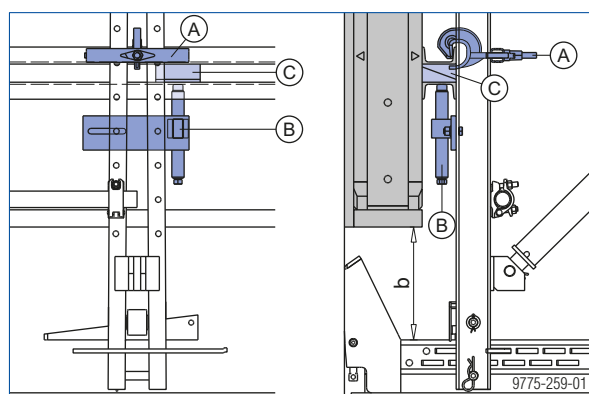
- Attach the crane lifting tackle to the lifting brackets on the pre-assembled formwork.
- Crane-lift the formwork to the working platform.



- Fix the pre-assembled formwork to the vertical walings with waling-to-bracket holders.

Waling-to-bracket holder	Waling-to-bracket holder 9-15cm
H ... permitted horizontal load: 11 kN	H ... permitted horizontal load: 22 kN
	

- Fix timber wedges in the multi-purpose walings (for better load-transfer in the area around the adjusting spindles).
- Adjust dimension 'b' as per shop drawing / assembly plan, using the adjusting spindle (see the section headed 'Plumbing & aligning the formwork').

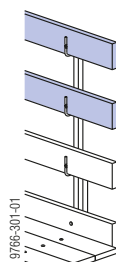


A Waling-to-bracket holder 9-15cm

B Height-adjusting spindle

C Timber wedges

- Insert guardrail boards and use nails to secure them to the handrail-post plates.

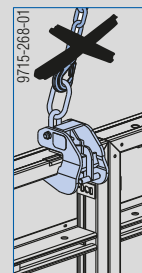
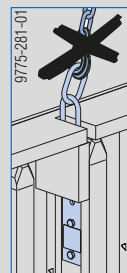


Add provisions to safeguard improper lifting and repositioning of the unit as one piece.

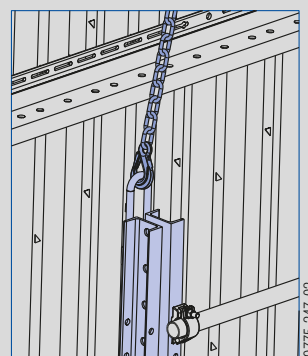


WARNING

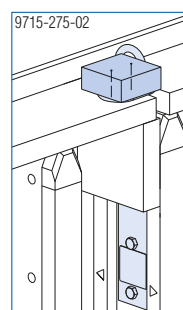
- Any **lifting brackets** on the formwork panels, or **Framax lifting hooks**, must **not** be used for lifting the unit as a whole.



- Attach the crane lifting tackle to the lifting brackets of the vertical waling.

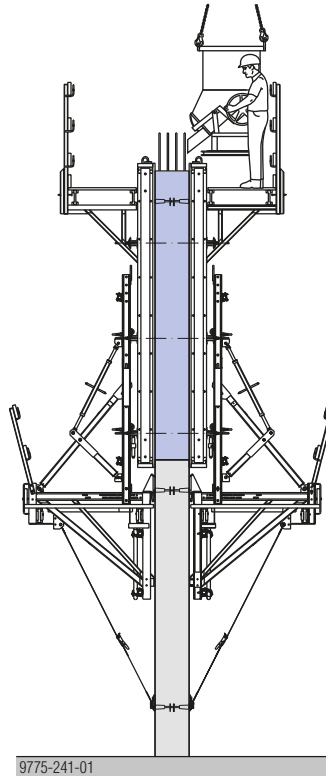


- e.g. nail on a board in such a way that the crane lifting tackle cannot be hung into place in the lifting bracket.



Formwork set-up and pouring

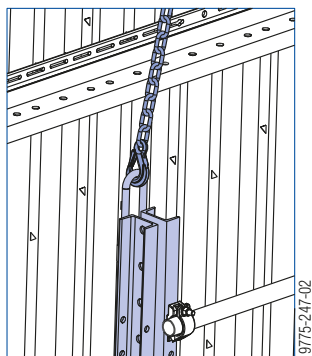
- ▶ Apply concrete release agent and set up one side of the formwork.
- ▶ Mount the positioning points.
- ▶ Place the reinforcement.
- ▶ Close the formwork and tie it.
- ▶ Pour the 2nd section.



- ▶ Strike the formwork.
- ▶ Clean the formwork.

3rd casting section

- Prepare the suspension points.
- Dismount the 'Wind bracing'.
- Attach the lifting chain to the lifting-brackets of the Vertical waling.

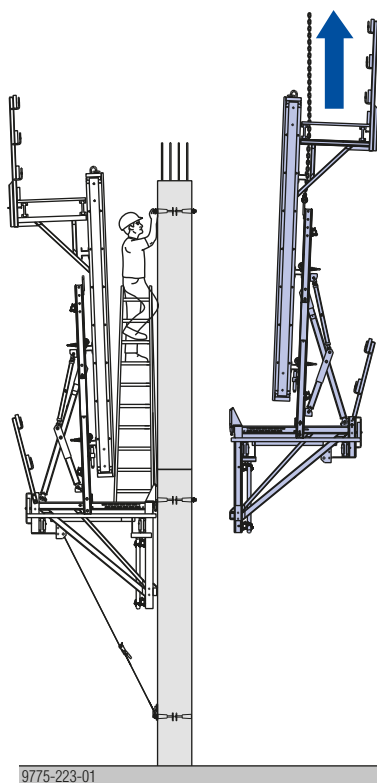


- Remove the fastening bolts (= lift-out guard) from the suspension points.

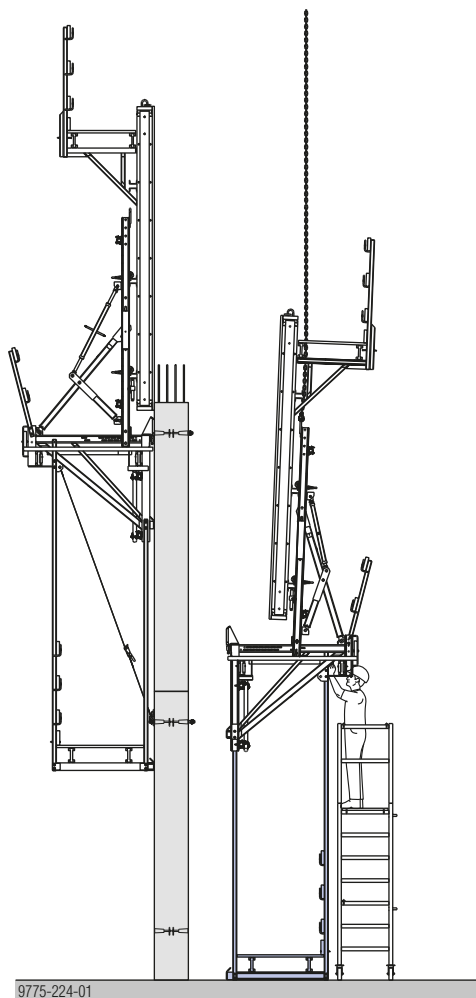


NOTICE

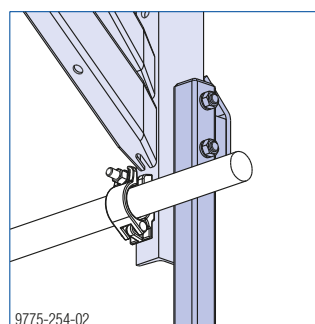
- When loosening the fixing-nuts, take care not to undo the climbing cone itself.
- Loosen the fixing-nuts of the climbing cones using a Reversible ratchet 1/2" and Box spanner 41.
- Lift the working platform to the pre-assembled suspended platforms.



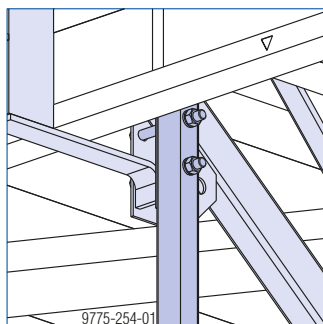
- Mount the suspended platform, working from a mobile scaffold tower.



- Bolt on the inside suspension tube with an M 16x120 hexagon bolt.



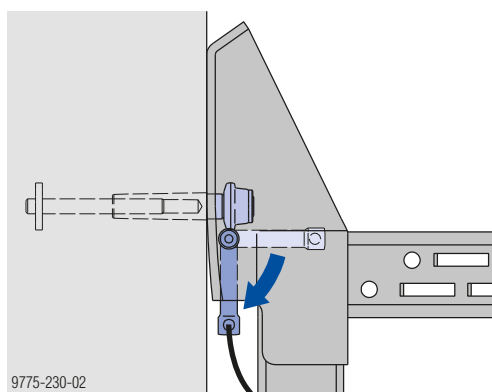
- ▶ Bolt on the outside suspension tube with an M 16x140 hexagon bolt.



- ▶ Lift the entire unit by crane and hang it into place in the suspension point.
- ▶ Secure the climbing formwork to the suspension points with fastening bolts.



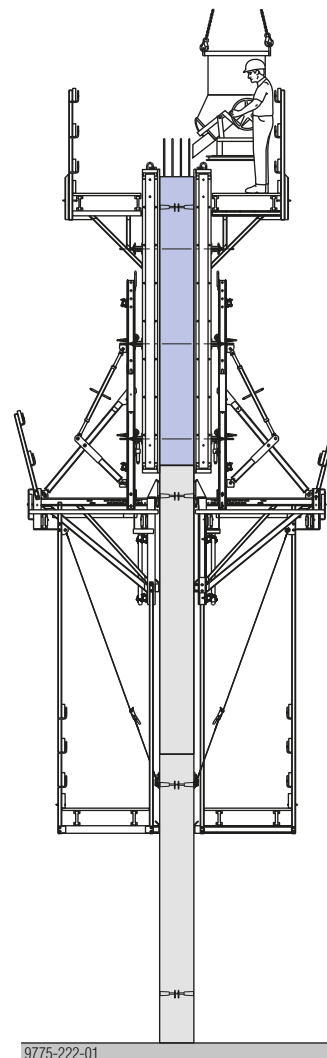
The fastening bolt must be pointing vertically downward!



- ▶ Tighten the fixing-nuts of the climbing cones using a Reversible ratchet 1/2" and Box spanner 41.
- ▶ If necessary, mount a "Wind bracing".

Formwork set-up and pouring

- ▶ Apply concrete release agent and set up one side of the formwork.
- ▶ Mount the positioning points.
- ▶ Place the reinforcement.
- ▶ Close the formwork and tie it.
- ▶ Pour the 3rd section.

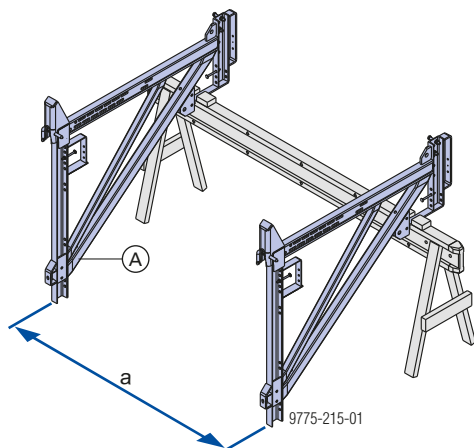


Assembly

Assembling the working platform

Aligning the Climbing brackets

- Set down the Climbing brackets on an assembling trestle, spaced apart by the exact centre-to-centre distance.

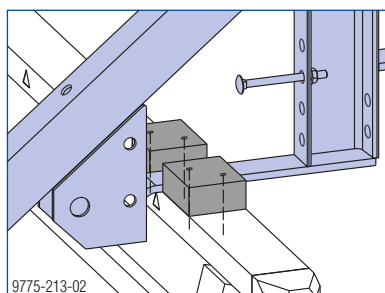


a ... centre-to-centre distance

A Climbing bracket 150F



Nail on stop-blocks to ensure constant centre-to-centre distances.

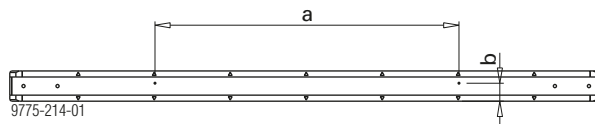


Mounting the decking supports

Note:

The choice of decking support depends on the project. The following configuration is shown with Doka beams H20.

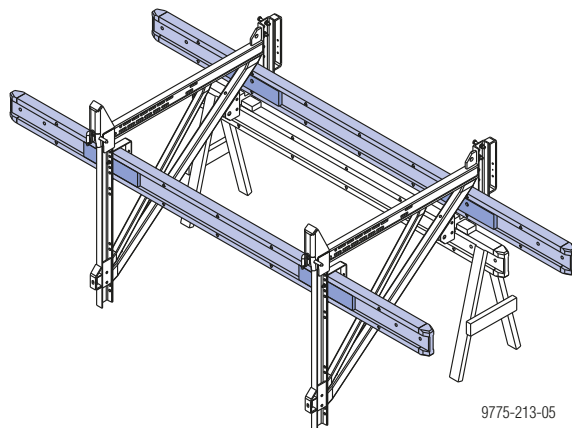
- Pre-drill the platform beams. Hole diameter 10 mm



a ... centre-to-centre distance

b ... 120 mm

- Bolt the Doka beams H20 to the climbing brackets.



Attachment scheme at front	Attachment scheme at rear
<p>Bolts required for each connection: (included in scope of supply of Climbing bracket 150 F).</p> <ul style="list-style-type: none"> ▪ 1 x square bolt M10x120 + hexagon nut M10 + washer 13 	

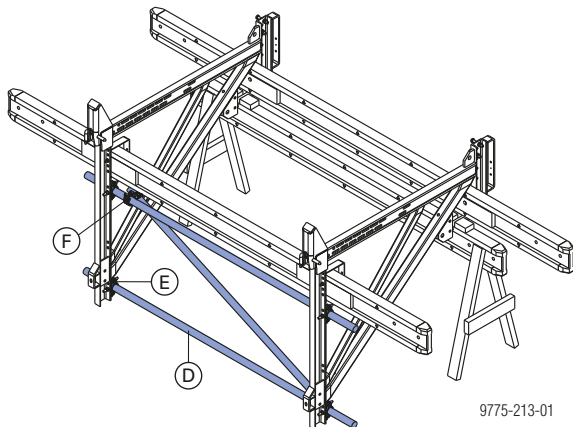
Dimensions

Type of beam	Wooden spacer [mm]	
	(B)	(C)
H20 P	min. 35 x 120	29 x 120
H20 N	min. 30 x 120	24.2 x 120

Length of wooden spacers approx. 50 cm.

Fitting the bracing

- Attach bracing (scaffolding tubes).
Distance between screw-on coupler and swivel coupler: max. 160 mm.



- D Scaffold tube 48.3mm
- E Screw-on coupler 48mm 50
- F Swivel coupler 48mm

Tightening torque of the couplers for the bracing tubes:
50 Nm

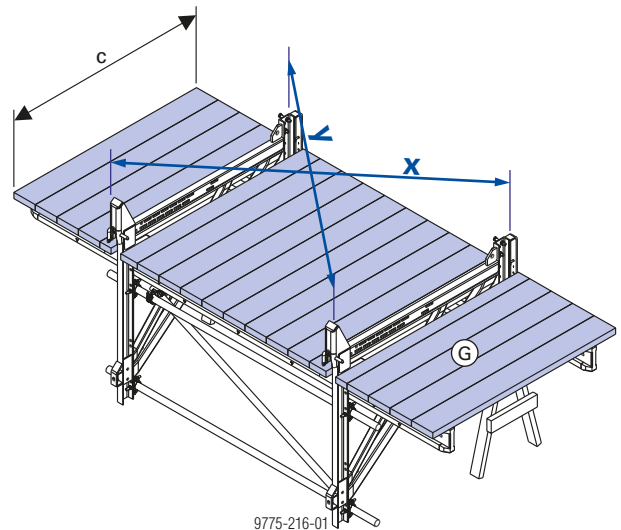
Mounting the deck-boards

- Arrange the climbing brackets so that both diagonals are the same.
- Lay deck-boards **flush** to either side of each Climbing bracket.
- Fasten deck-boards to the Doka beams with Torx TG 6x90 A2 universal countersunk screws.



Every deck-board must be fixed with 4 screws!

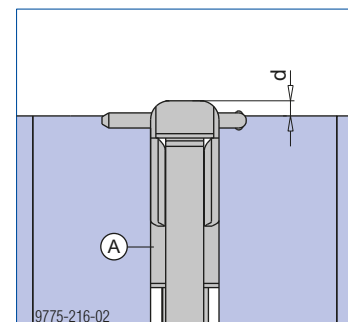
Do a sight-check to make sure that the deck-boards have been fixed properly!



c ... 1700 mm
x = y ... diagonals

G e.g. plank 5/20 cm

Platform decking on the suspension-point side:



d ... 20 mm

A Climbing bracket 150F

Note:

The plank and board thicknesses stated comply with the EN 338 C24 timber.

Observe all national regulations applying to deck and guardrail boards.

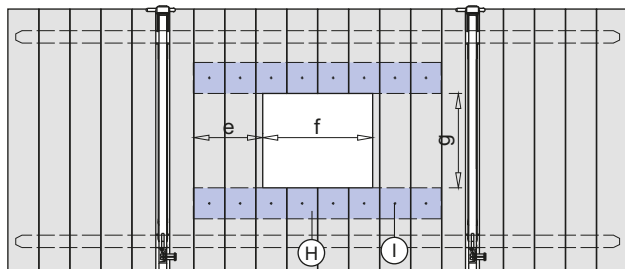
Fitting a manhole

- Screw planks to the underside of the deck-boards to distribute the loads.



Every deck-board must be fixed with a square bolt M10 and a hexagon nut M10!
Do a sight-check to make sure that the deck-boards have been fixed properly!

- Cut out the opening for the manhole.



9775-272-01

e ... minimum overlap: 2 whole deck-boards

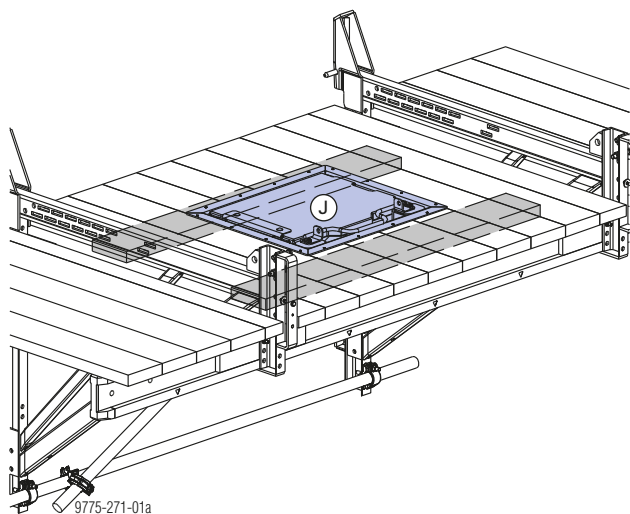
f ... 710 mm

g ... 610 mm

H e.g. plank, 5x20 cm

I Square bolt M10 + washer R11 + hexagon nut M10

- Screw the Manhole B 70/60cm onto the deck-boards with universal countersunk screws 5x50.

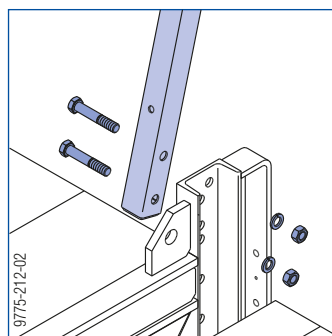


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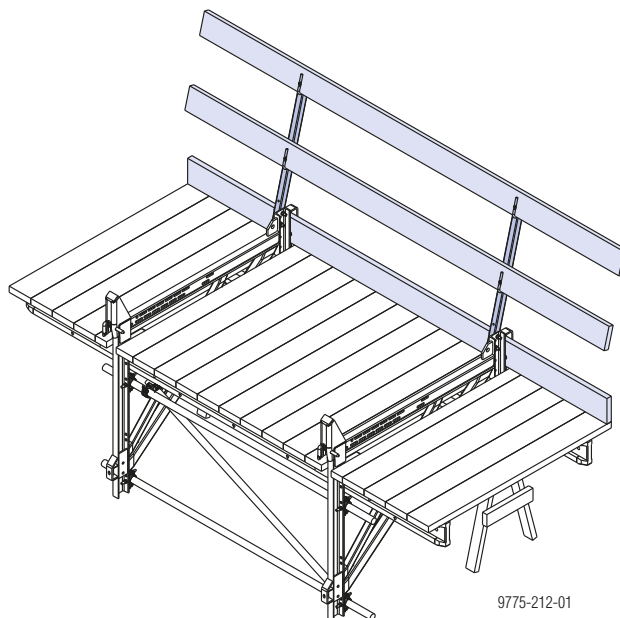
H Manhole B 70/60cm

Mounting the railing

- Bolt handrail-post uprights onto the Climbing bracket with M16 nuts & bolts.



- Attach a toeboard (min. 15x3 cm) to the Climbing bracket with a square bolt M10.
- Insert guard-rail boards and use nails to secure them to the handrail post plates.



9775-212-01

Bolting-items needed for each handrail-post upright:

- 1 square bolt M10x60
- 1 washer A10
- 1 hexagon nut M10

Note:

The plank and board thicknesses given here comply with the C24 category of EN 338.

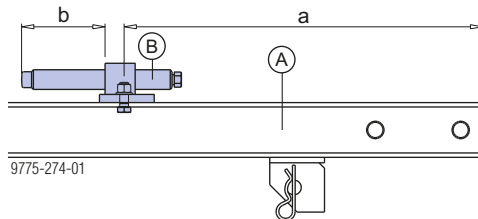
Observe all national regulations applying to deck-boards and guard-rail boards.

Mounting the Vertical waling and scissor-action spindle

Setting the adjusting spindle

Tools needed:

- Reversible ratchet 1/2"
 - Box nut 24 and
 - Fork wrench 22/24 (for the threaded joins on the adjusting spindle)
- Adjust dimension "b" as shown in the shop drawing / assembly plan, using the adjusting spindle.



A Vertical waling 3.00m

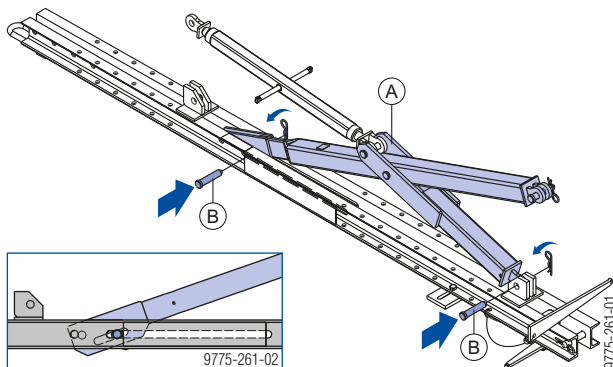
B Adjusting spindle



Check position "a" of the adjusting spindle on the vertical waling and change this if necessary.

Mounting the scissor-action spindle

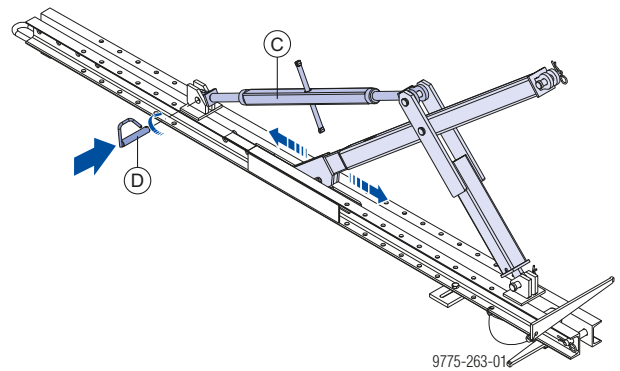
- Bolt the scissor-action spindle to the Vertical waling 3.00m with a D25/120 head bolt and secure this with a Spring cotter 5mm.



A Scissor-action spindle

B D25/120 head bolt

- Pin the spindle tube onto the Vertical waling 3.00m with the handle-bolt.

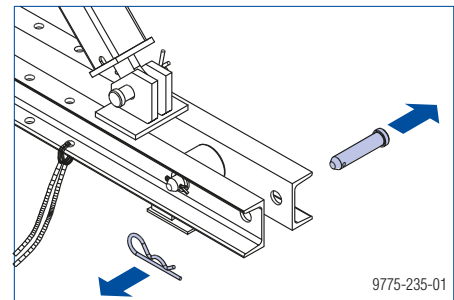


C Spindle tube

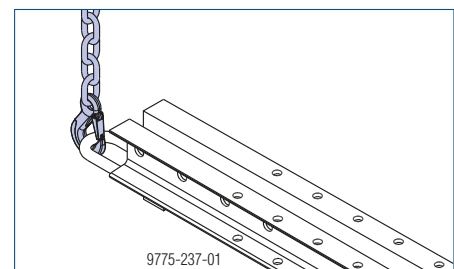
D Handle-bolt

Mounting the Vertical waling

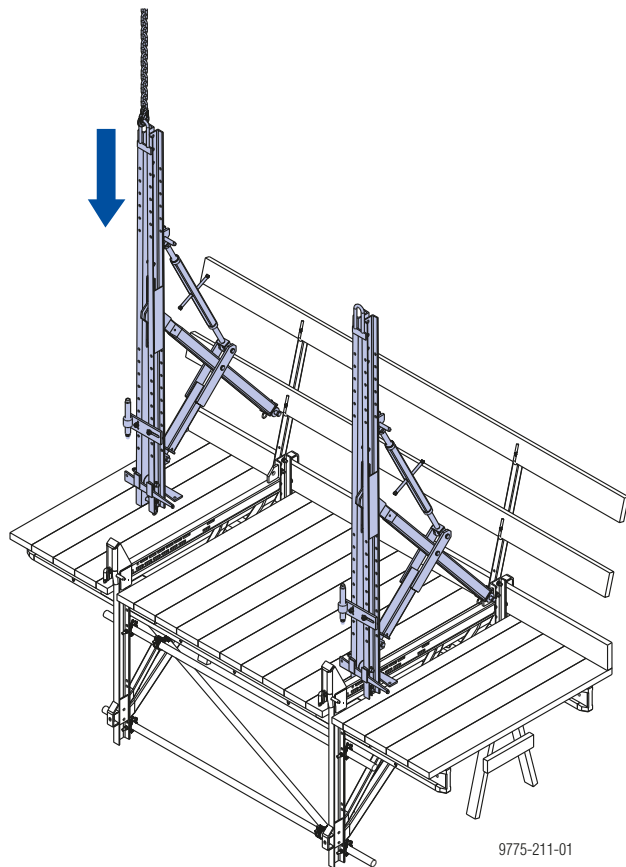
- Remove the D25/120 head bolt from the bottom hole of the Vertical waling.



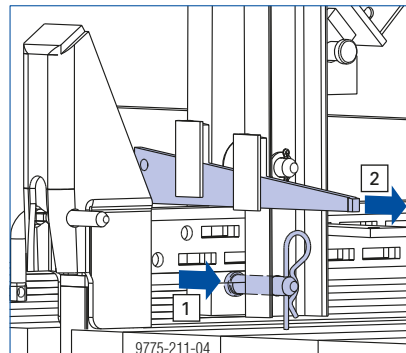
- Attach the lifting chain to the lifting-brackets of the Vertical waling and raise this pre-assembled unit.



- Lower the pre-assembled unit onto the Climbing bracket by crane.



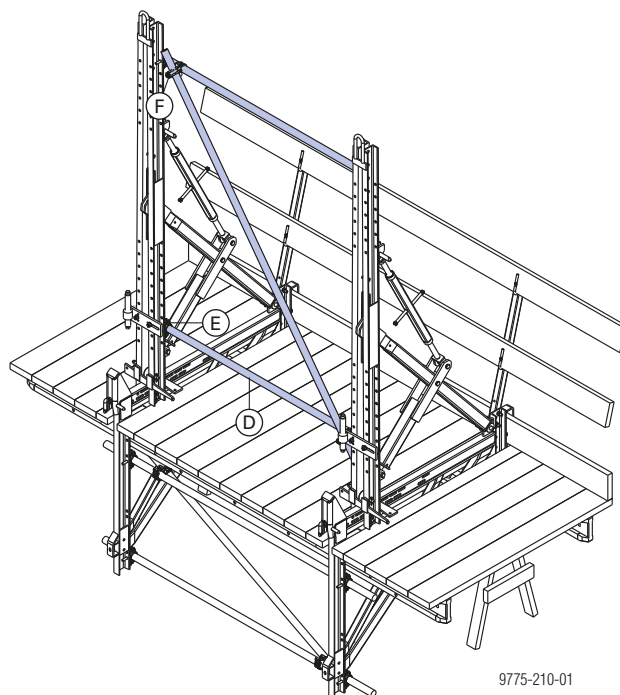
- 2) Knock the fixing-wedge into place. This fixes the Vertical waling to the Climbing bracket.



- Detach the lifting chain from the Vertical waling.

Fitting the bracing

- Move both Vertical walings 3.00m into the same position by turning the screwjack mechanism on the scissor-action spindles.
- Attach bracing (scaffolding tubes). Distance between screw-on coupler and swivel coupler: max. 160 mm.



D Scaffold tube 48.3mm

E Screw-on coupler 48mm 50

F Swivel coupler 48mm

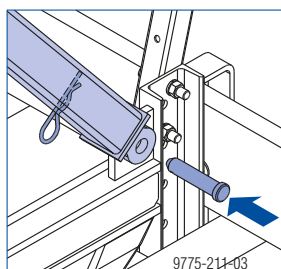
Tightening torque of the couplers for the bracing tubes:
50 Nm

CAUTION

- Do not detach the lifting chain from the Vertical waling until the unit has been properly connected to the Climbing bracket as described below.

On the side nearest the railings:

- Bolt the scissor-action spindle to the rear connector plate of the Climbing bracket with a D25/120 head bolt and secure this with a Spring cotter 5mm.



On the side nearest the formwork:

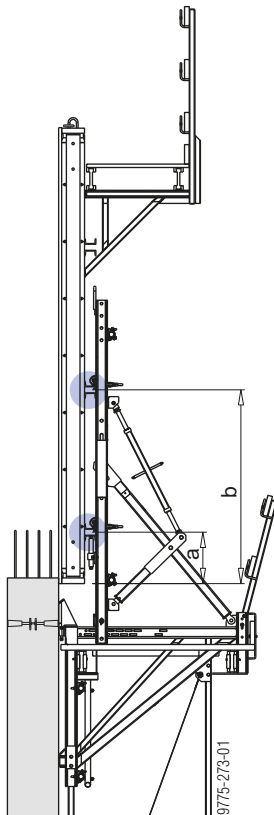
- 1) Fix a D25/120 head bolt in the Vertical waling and secure it with a Spring cotter 5mm.

Mounting the formwork



NOTICE

It is not permitted to locate Multi-purpose walings anywhere in the range of travel of the scissor-action spindle.



Useable ranges for the Multi-purpose walings WS10:

- a ... 300 to 550 mm (1st Multi-purpose waling)
- b ... 1660 to 2270 mm (2nd Multi-purpose waling)

Necessary preconditions:

- Formwork overlap: 50 mm
- Distance between climbing cone and top of concrete: 400 mm

Timber-beam formwork

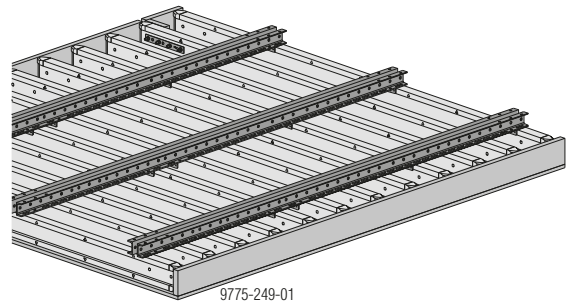
e.g. Large-area formwork Top 50



Follow the directions in the 'Large-area formwork Top 50' User Information booklet!

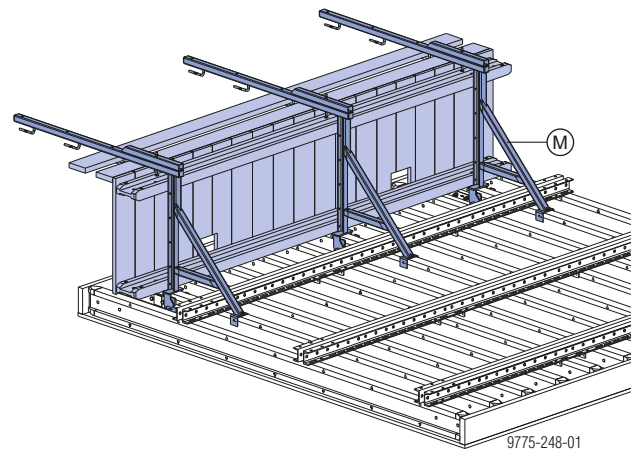
Preparing the formwork

- Set the formwork element down on a flat surface, with the form-ply facing downwards.



Mounting the pouring platform

- Attach Universal brackets and mount deck-boards.
- Also mount guard-rail boards, except where they would get in the way of the lifting chains when the gang-form is lifted into the upright.



M Universal bracket 90

Framed formwork

e.g. framed formwork Framax Xlife



Follow the directions in the "Framed formwork Framax Xlife" User Information booklet!

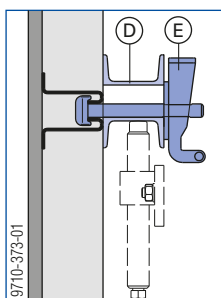
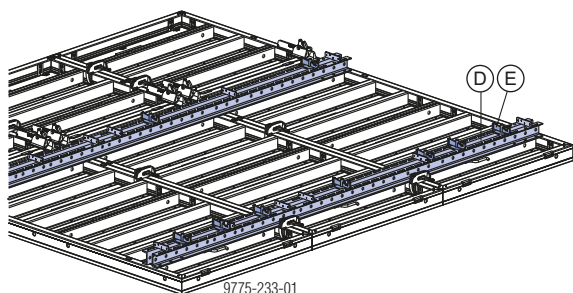
Preparing the formwork

- Set the gang-form down on a flat surface, with the form-ply facing downwards.
- Fix Multi-purpose walings WS10 Top50 in the waling profiles of the framed formwork panels, using Framax wedge clamps.



NOTICE

As an additional precaution, mount a wedge clamp at both ends of the adjusting spindle.



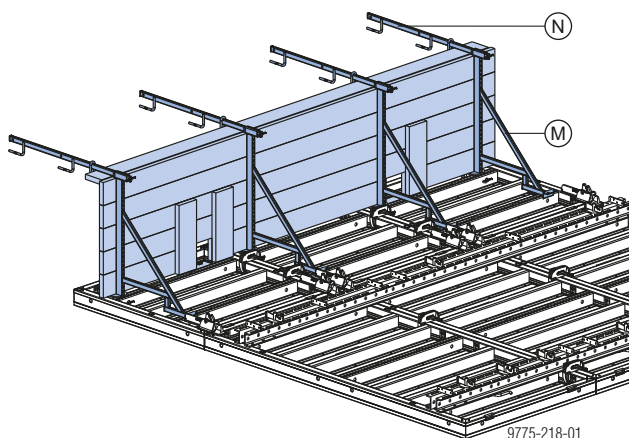
The length of the Multi-purpose waling WS10 Top50 will depend on the width of the gang-form.

D Multi-purpose waling WS10 Top50

E Framax wedge clamp

Mounting the pouring platform

- Secure the Framax brackets and install the deck-boards.
- Also install Handrail posts 1.00m and guardrail boards, except where they would get in the way of the lifting chains when the gang-form is lifted into the upright.



M Framax bracket 90 EP

N Handrail post 1.00m

Assembling the suspended platform

Note:

The plank and board thicknesses given here comply with the C24 category of EN 338.

Observe all national regulations applying to deck-boards and guard-rail boards.

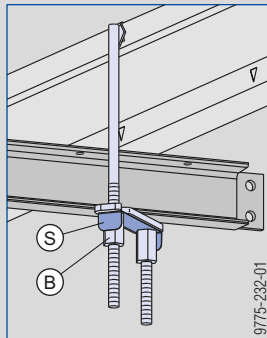
Mounting the decking supports



CAUTION

There is a risk of the hexagon nuts working loose on the Brace stirrup 8.

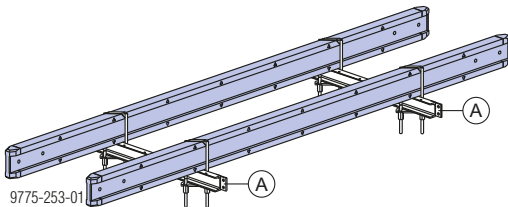
- Fix the hexagon nuts on the Brace stirrup 8 with a **Safety plate for brace stirrup 8**.



Always bend the anti-twisting plate over the flat side of the hexagon nut.

Use each anti-twisting plate once only.

- Mount Doka beams H20 to the platform profiles with e.g. Brace stirrups 8.



A Platform profile

B Brace stirrup 8

S Anti-twisting plate for Brace stirrup 8

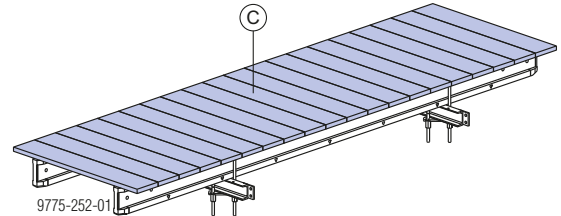
Mounting the deck-boards

- Fasten deck-boards to the Doka beams with Torx TG 6x90 A2 universal countersunk screws.



Every deck-board must be fixed with 4 screws!

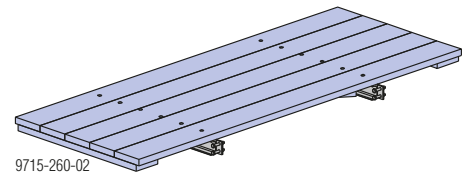
Do a sight-check to make sure that the deck-boards have been fixed properly!



C e.g. plank 5/20 cm



On small platforms the deck-boards can be mounted directly to the platform profiles with M 10x70 square bolts. Do not exceed the permitted support centres of the deck-boards!

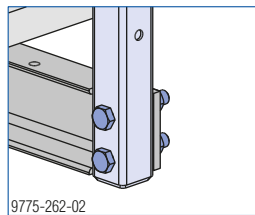
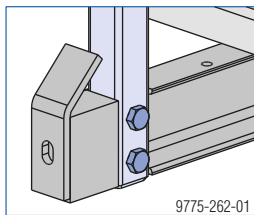
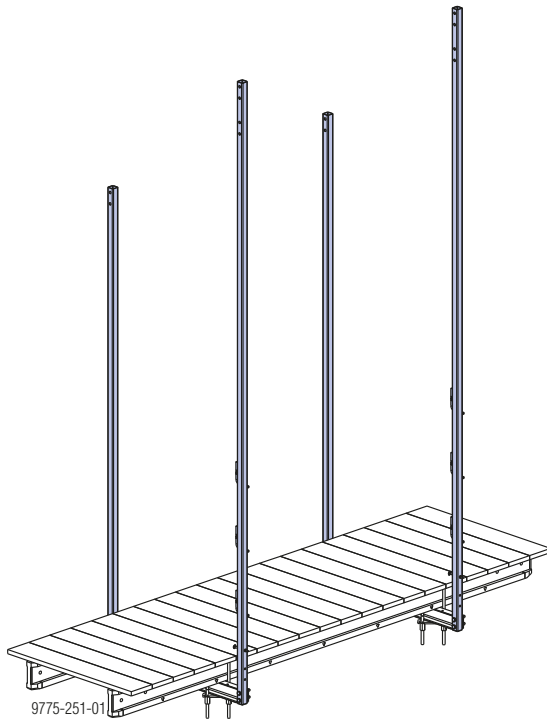


Note:

The choice of decking support depends on the project.

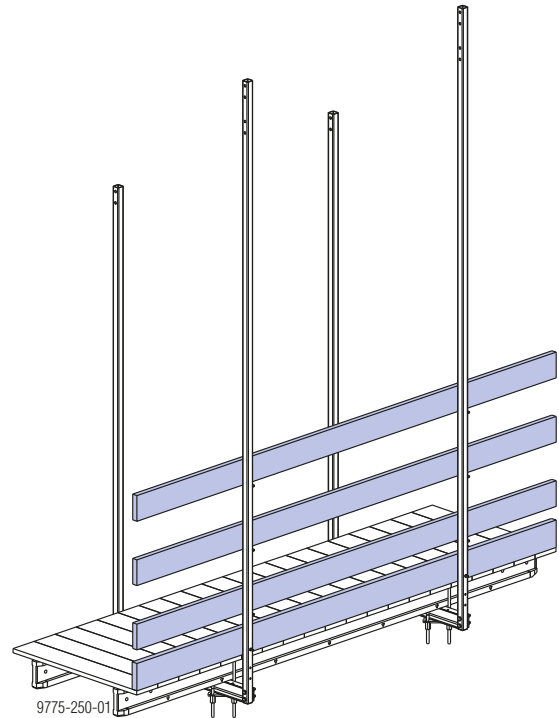
Mounting the suspension tubes

- Mount the suspension tubes to the platform profiles with two M16x90 hexagon bolts for each tube.



Mounting the guard-rail boards

- Attach a toeboard (min. 15x3 cm) to the Handrail-post upright with a square bolt M10.
- Insert guard-rail boards and use nails to secure them to the handrail post plates.



Bolting-items needed for each handrail-post upright:

- 1 square bolt M10x120
 - 1 washer A10
 - 1 hexagon nut M10
- (not included with product)

Sideguards on exposed platform-ends

Platform railings which do not extend all the way around the platform must be closed by attaching side railings, e.g. at

- **corner transitions**
- **exposed fall-hazard locations** which result from a climbing unit being repositioned



WARNING

Exposed fall-hazard location!

Danger to life from fatal falls!

- Use personal fall-arrest systems or install the sideguards at the same time as the platforms are assembled.

Note:

The plank and board thicknesses stated comply with the EN 338 C24 timber.

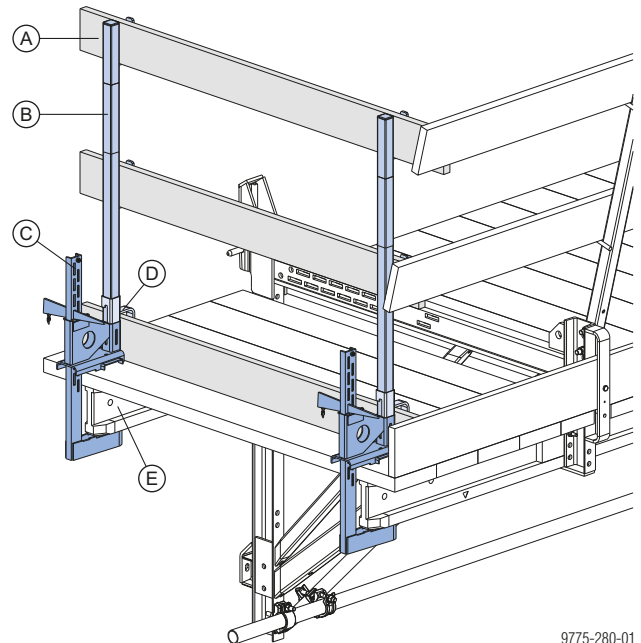
Observe all national regulations applying to deck and guardrail boards.

Handrail clamp S



Follow the directions in the 'Handrail clamp S' User Information booklet.

Edge protection system XP



9775-280-01

A Guardrail board min. 15/3 cm (site-provided)

B Handrail post XP 1.20m

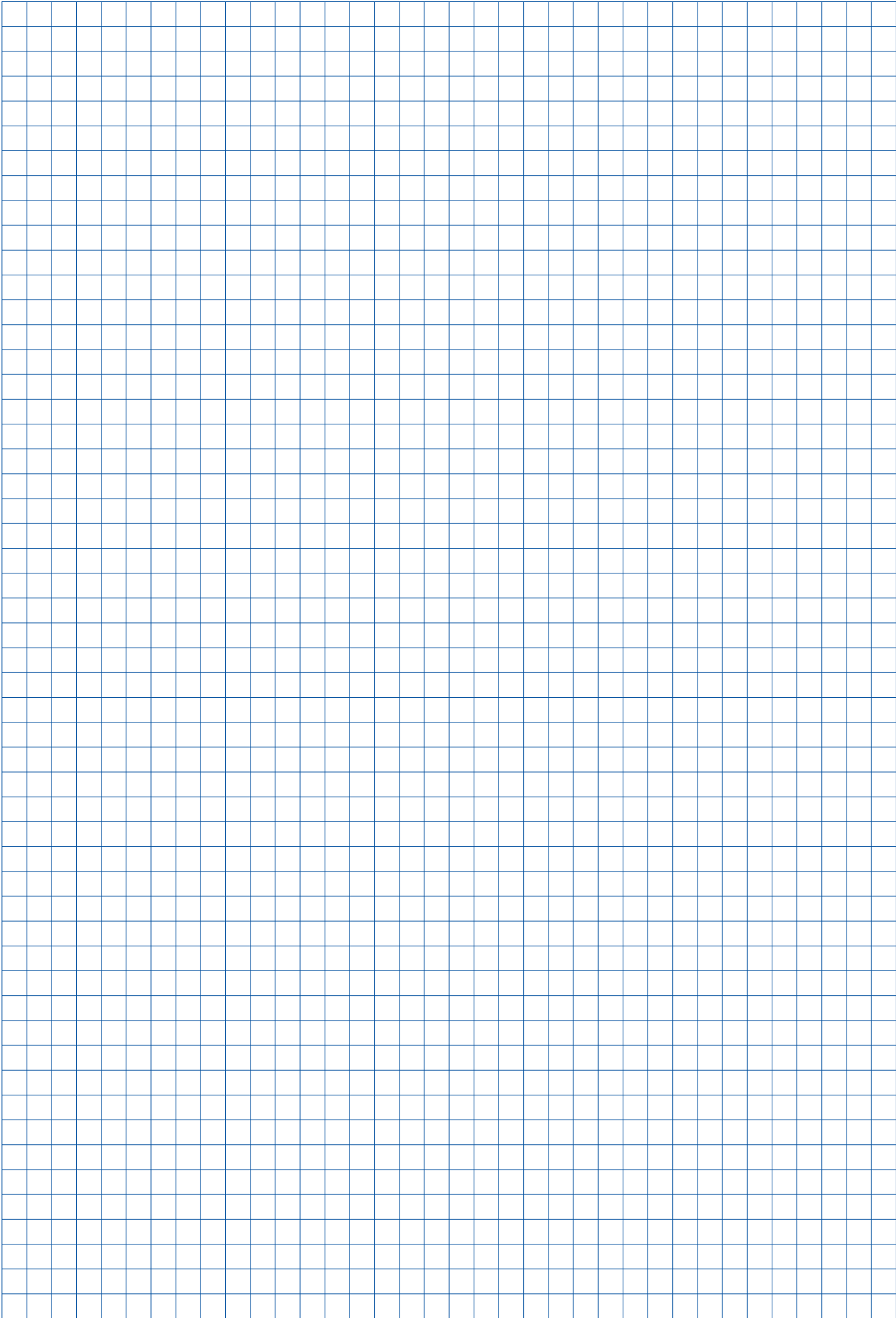
C Railing clamp XP 40cm

D Toeboard holder XP 1.20m

E Decking support

Installation:

- Wedge the Railing clamps XP firmly to the decking supports (clamping range 2 – 43 cm).
- Working from below, push a Toeboard holder XP 1.20m onto the Handrail post XP 1.20m.
- Push the Handrail post XP 1.20m into the post-holding fixture on the Railing clamps XP until the locking mechanism engages.
- Fix guardrail boards to the Handrail-post plates with nails (diam. 5 mm).



Dismantling



NOTICE

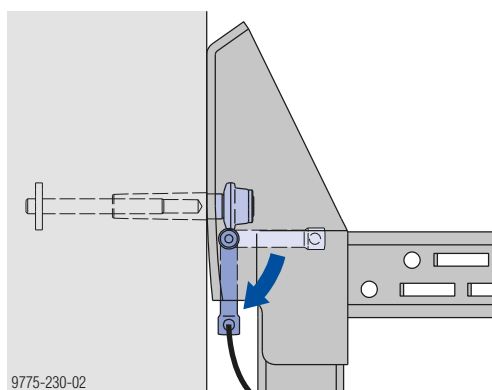
- A hard, flat, firm surface is needed!
- Provide a sufficiently large dismantling space.
- Read and observe the section headed "Resetting by crane".

Lifting the formwork off the climbing unit

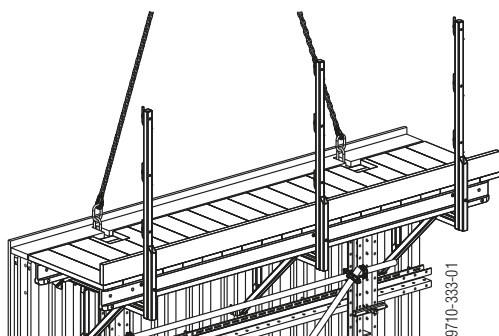
- Attach the lifting chain to the lifting brackets on the formwork gang.
- This protects the formwork against tipping over.



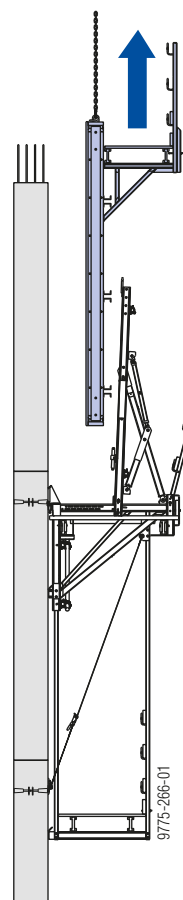
The fastening bolt must be pointing vertically downward!



- Remove the two top guard-rail boards from the pouring platform.



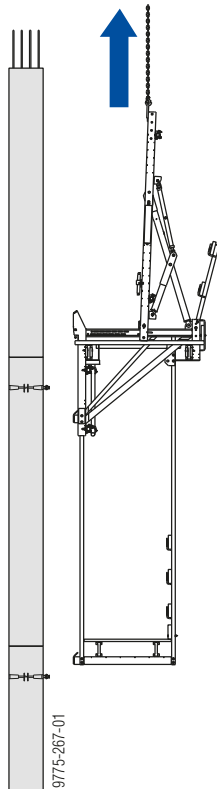
- Remove the waling-to-bracket holders and lift the formwork element or panel off the climbing unit.



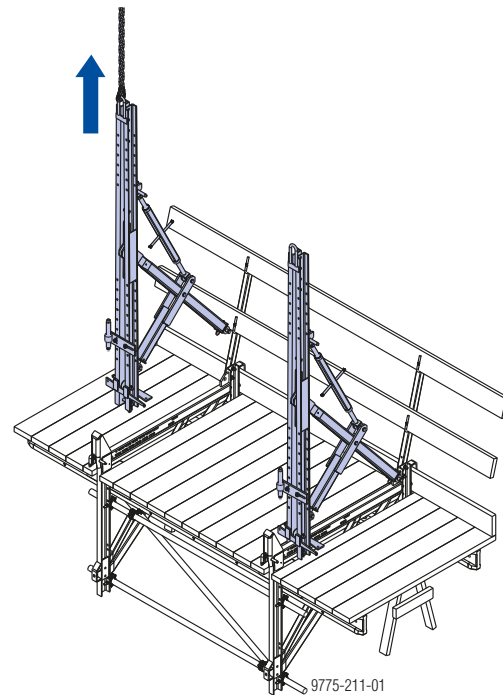
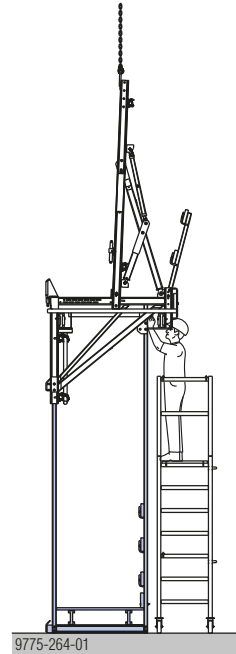
- Set down and dismantle the formwork element.

Lifting the climbing unit off the structure

- Attach the lifting chain to the lifting-brackets of the Vertical waling.
- Dismount the 'Wind bracing'.
- Remove the fastening bolts (= lift-out guard) from the suspension points.
- Gently raise the entire unit by crane, and move it away from the building.



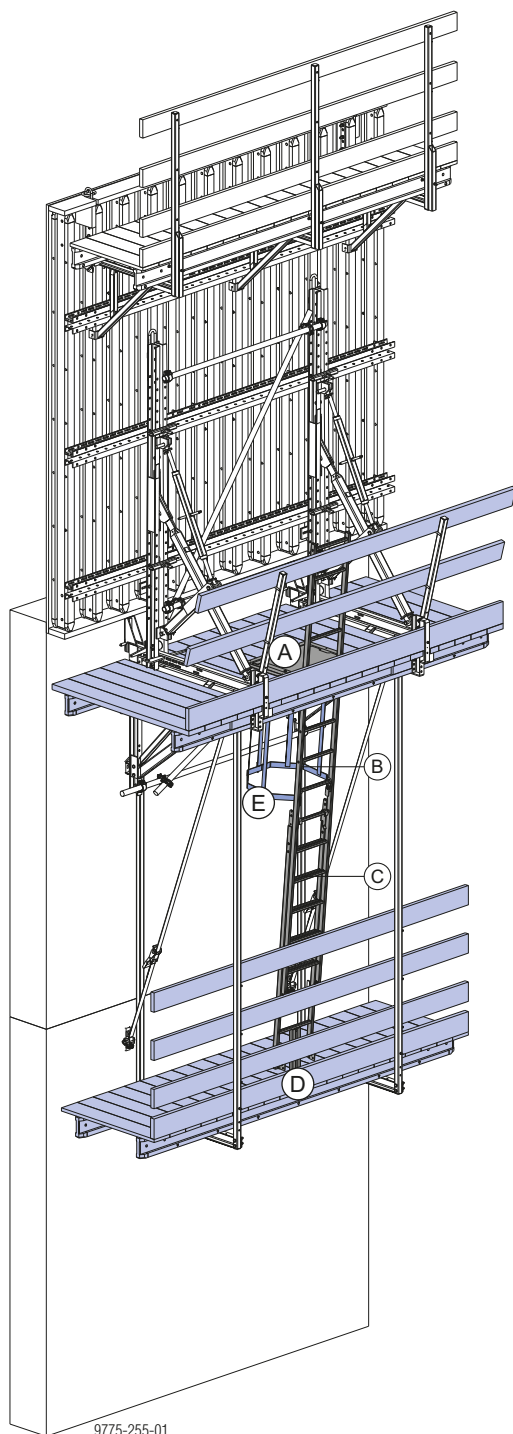
- All other dismantling steps are carried out on the ground, in the opposite order of steps from those in which the equipment was assembled.



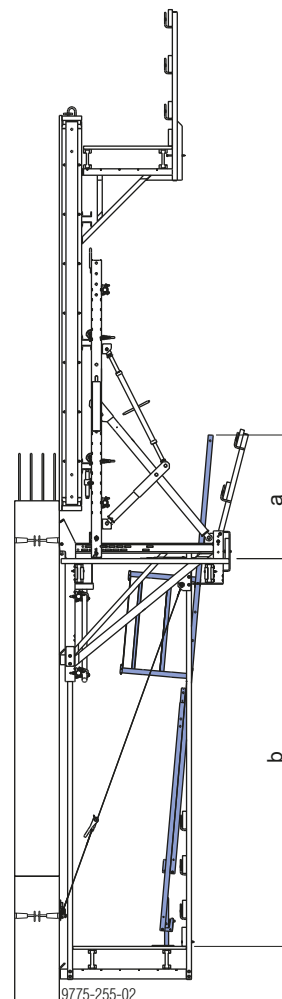
General

Ladder system

For safe up-and-down access between platforms.



- A Manhole B 70/60cm
- B System ladder XS 4.40m
- C Ladder extension XS 2.30m
- D Ladder adapter XS
- E Ladder cage XS



a ... min. 1 m
b ... height of casting section

Note:

The Ladder system XS must be implemented in such a way that all national regulations are complied with. Put up safety netting in the ladder and manhole zone, as required by the applicable regulations.



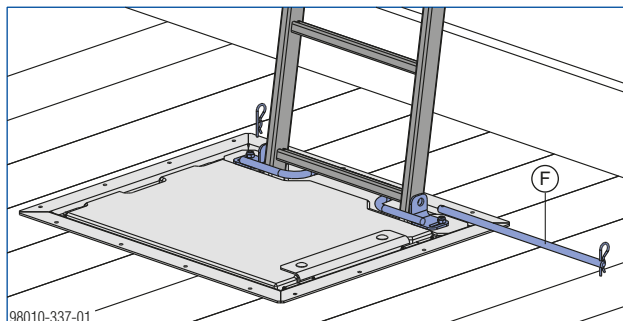
WARNING

► The Ladders XS may only be used as part of the XS system, and must NOT be used separately (as "lean-to" ladders).

Attaching the ladders

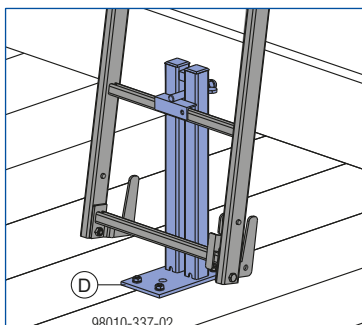
Manhole B 70/60cm

- Fix the System ladder XS 4.40m to the manhole with a ladder stirrup.
- Insert a Ladder bolt XS through the rung of the ladder and secure it on both sides with a d4 spring cotter.



F Ladder bolt XS

- Screw the Ladder adapter XS to the platform decking.
- Fix the bottom of the ladder to the Ladder adapter XS.

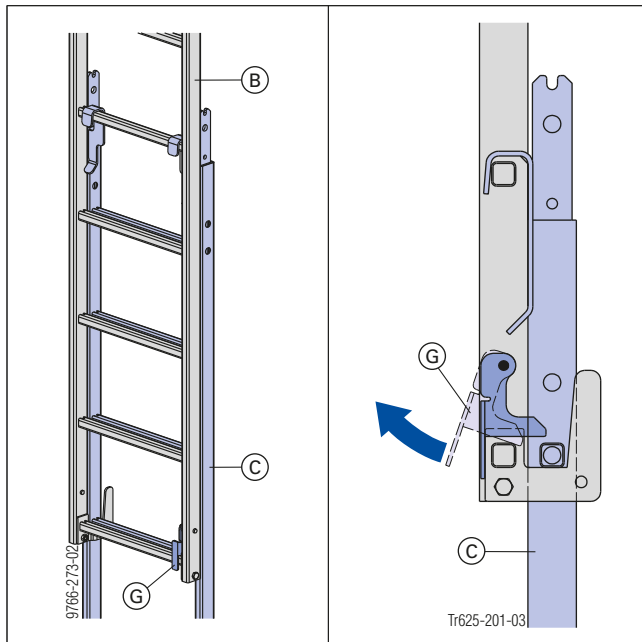


D Ladder adapter XS

Lengthening the ladder

Telescoping ladder extension (for adjusting to ground level)

- To telescope the ladders past one another, lift the safety latch on the ladder and fix the Ladder extension XS 2.30m onto the desired rung of the other ladder.



B System ladder XS 4.40m

C Ladder extension XS 2.30m

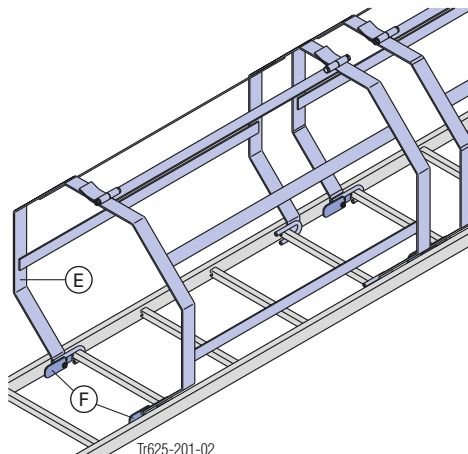
G Safety latch

Ladder cage



NOTICE

- Always observe all relevant safety regulations applying to the use of the Ladder cage XS in the country in which you are operating (e.g. in Germany: BGV D 36).
- Fix the Ladder cage XS 1.00m (E) onto the next available rung. The safety latches (F) prevent the cage being accidentally lifted out. Add further Ladder cages XS 1.00m, in each case fixing them onto the next available rung.



Transporting, stacking and storing

The following instructions must be complied with when storing and transporting separate parts or assemblies. This ensures careful, safe treatment of the equipment:

- The parts must be unloaded and off-loaded, transported and stacked in such a way that it is not possible for them to fall off, tip over or slide apart.
- Only set down the parts or assembly units on flat, firm, clean surfaces.
- Spread-angle β of slinging chains: max. 30° .
- Do not detach parts from the lifting straps until they have been safely set down.
- When transporting the equipment by truck, bundle the components or otherwise secure them against slippage, or else transport them in suitable containers.
- Protect all components against soiling, as this prolongs their service life.
- Clearly arranged, logical storage arrangements reduce the time needed for assembly.
- Using intermediate packing timbers during storage and transport lessens the risk of damage.

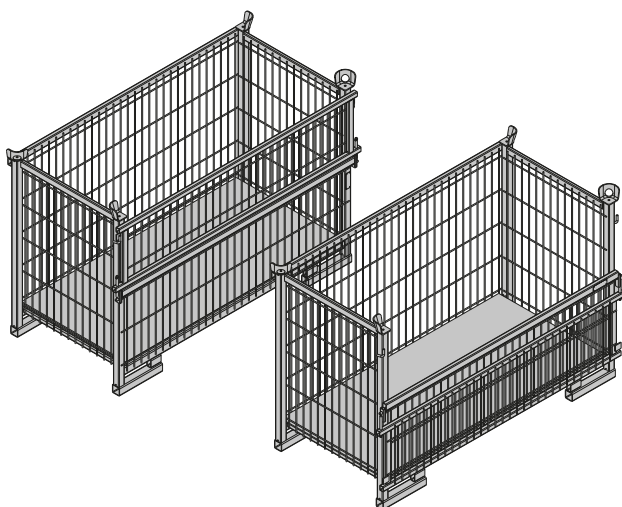
Please co-ordinate arrangements for return delivery of the equipment with the Doka branch responsible.

Utilise the benefits of Doka multi-trip packaging on your site.

Multi-trip packaging such as containers, stacking pallets and skeleton transport boxes keep everything in place on the site, minimise time wasted searching for parts, and streamline the storage and transport of system components, small items and accessories.

Doka skeleton transport box 1.70x0.80m

Storage and transport device for small items



Max. load-bearing capacity: 700 kg (1540 lbs)
Permitted imposed load: 3150 kg (6950 lbs)

To make the Doka skeleton transport box easier to load and unload, one of its sidewalls can be opened.

Using Doka skeleton transport boxes 1.70x0.80m as storage units

Max. n° of units on top of one another

Outdoors (on the site) Floor gradients up to 3%	Indoors Floor gradients up to 1%
2	5
It is not allowed to stack empty pallets on top of one another!	



NOTICE

Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

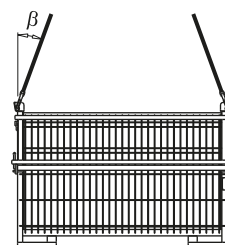
Using Doka skeleton transport boxes 1.70x0.80m as transport devices

Lifting by crane



NOTICE

- Multi-trip packaging items may only be lifted one at a time.
- Only lift the boxes when their sidewalls are closed!
- Use a suitable crane suspension tackle (e.g. Doka 4-part chain 3.20m).
Do not exceed the permitted load-bearing capacity.
- Spread angle β max. 30° !



9234-203-01

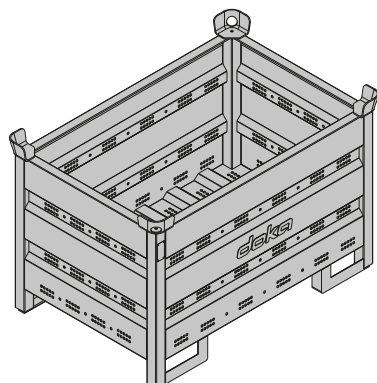
Repositioning by forklift truck or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

Doka multi-trip transport box

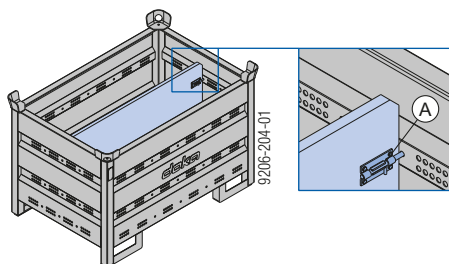
Storage and transport device for small items

Doka multi-trip transport box 1.20x0.80m



Max. carrying capacity: 1500 kg (3300 lbs)
Permitted imposed load: 7850 kg (17300 lbs)

Different items in the Doka multi-trip transport box can be kept separate with the **Multi-trip transport box partitions 1.20m or 0.80m**.

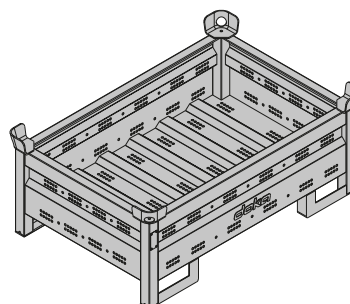


A Slide-bolt for fixing the partition

Possible ways of dividing the box

Multi-trip transport box partition	in the longitudinal direction	in the transverse direction
1.20m	max. 3 partitions	-
0.80m	-	max. 3 partitions
	9206-204-02	9206-204-03

Doka multi-trip transport box 1.20x0.80mx0.41m



Max. carrying capacity: 750 kg (1650 lbs)
Permitted imposed load: 7200 kg (15870 lbs)

Using Doka multi-trip transport boxes as storage units

Max. n° of units on top of one another

Outdoors (on the site)		Indoors	
Floor gradients up to 3%		Floor gradients up to 1%	
Doka multi-trip transport box 1.20x0.80m	Doka multi-trip transport box 1.20x0.80x0.41m	Doka multi-trip transport box 1.20x0.80m	Doka multi-trip transport box 1.20x0.80x0.41m
3	5	6	10
It is not allowed to stack empty pallets on top of one another!			



NOTICE

Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

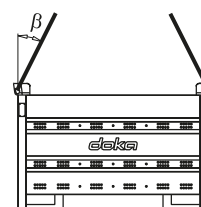
Using Doka multi-trip transport boxes as transport devices

Lifting by crane



NOTICE

- Multi-trip packaging items must be lifted individually.
- Use a suitable crane lifting tackle (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread angle β max. 30°!



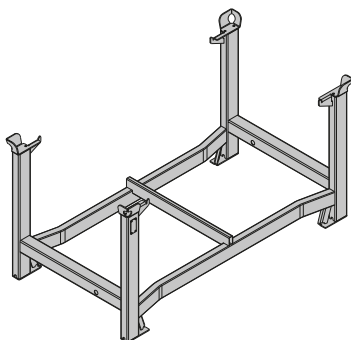
9206-202-01

Repositioning by forklift truck or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

Doka stacking pallet 1.55x0.85m and 1.20x0.80m

Storage and transport devices for long items.



Max. carrying capacity: 1100 kg (2420 lbs)
Permitted imposed load: 5900 kg (12980 lbs)

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

Outdoors (on the site) Floor gradients up to 3%	Indoors Floor gradients up to 1%
2	6
It is not allowed to stack empty pallets on top of one another!	



NOTICE

- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- How to use with Bolt-on castor set B:**
 - Always apply the fixing brake when the container is "parked".
 - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.

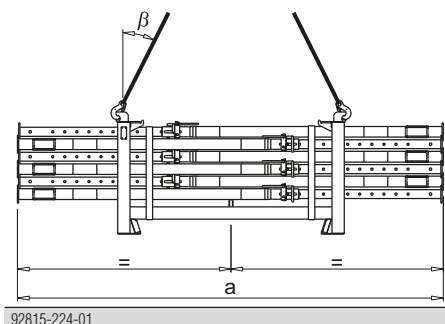
Using Doka stacking pallets as transport devices

Lifting by crane



NOTICE

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable crane suspension tackle (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Load the items centrally.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.
- Spread angle β max. 30°!



	a
Doka stacking pallet 1.55x0.85m	max. 4.5 m
Doka stacking pallet 1.20x0.80m	max. 3.0 m

Repositioning by forklift truck or pallet stacking truck

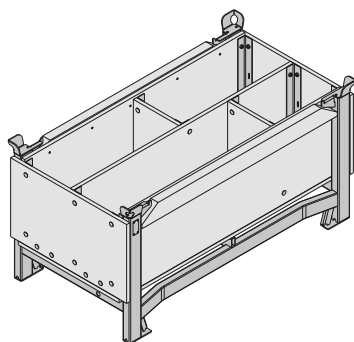


NOTICE

- Load the items centrally.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.

Doka accessory box

Storage and transport device for small items



Max. carrying capacity: 1000 kg (2200 lbs)
Permitted imposed load: 5530 kg (12191 lbs)

Doka accessory boxes as storage units

Max. n° of units on top of one another

Outdoors (on the site) Floor gradients up to 3%	Indoors Floor gradients up to 1%
3	6
It is not allowed to stack empty pallets on top of one another!	



NOTICE

- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- How to use with Bolt-on castor set B:**
 - Always apply the fixing brake when the container is "parked".
 - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.

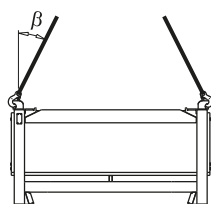
Doka accessory box as transport devices

Lifting by crane



NOTICE

- Multi-trip packaging items must be lifted individually.
- Use a suitable crane lifting tackle (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread angle β max. 30°!



92816-206-01

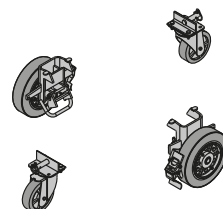
Repositioning by forklift truck or pallet stacking truck

The forks can be inserted under either the broadside or the narrow side of the containers.

Bolt-on castor set B

The Bolt-on caster set B turns the stacking pallet into a fast and manoeuvrable transport device.

Suitable for drive-through access openings > 90 cm.



The Bolt-on caster set B can be mounted to the following multi-trip packaging items:

- Doka accessory box
- Doka stacking pallets

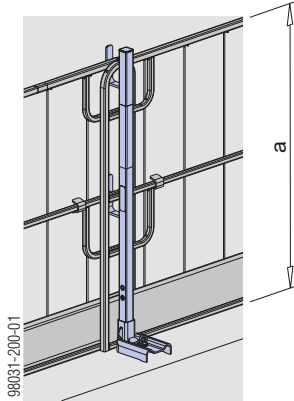


Follow the directions in the 'Bolt-on castor set B' Operating Instructions!

Fall-arrest systems on the structure

Handrail post XP 1.20m

- Attached with Screw-on shoe XP, railing clamp, Handrail-post shoe or Step bracket XP
- Protective grating XP, guard-rail boards or scaffold tubes can be used as the safety barrier



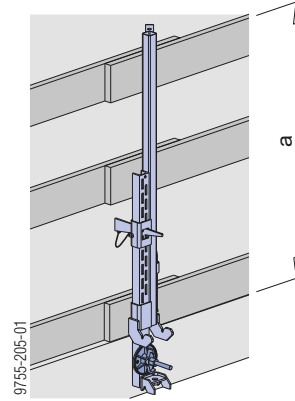
a ... > 1.00 m



Follow the directions in the 'Edge protection system XP' User Information booklet!

Handrail clamp T

- Fixed in embedded anchoring components or reinforcement hoops
- Guard-rail boards or scaffold tubes can be used as the safety barrier



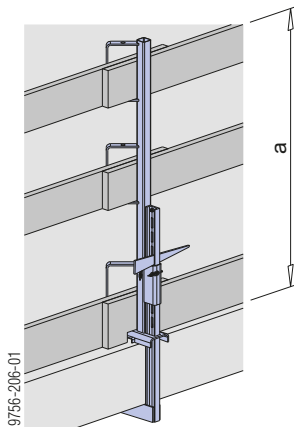
a ... > 1.00 m



Follow the directions in the 'Handrail clamp T' User Information!

Handrail clamp S

- Attached with integral clamp
- Guard-rail boards or scaffold tubes can be used as the safety barrier



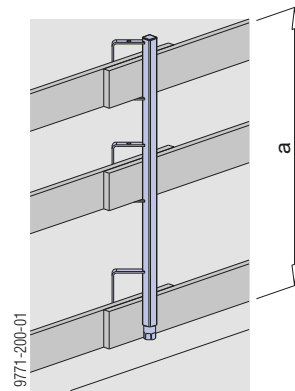
a ... > 1.00 m



Follow the directions in the "Handrail clamp S" User information!

Handrail post 1.10m

- Fixed in a Screw sleeve 20.0 or Attachable sleeve 24mm
- Guard-rail boards or scaffold tubes can be used as the safety barrier

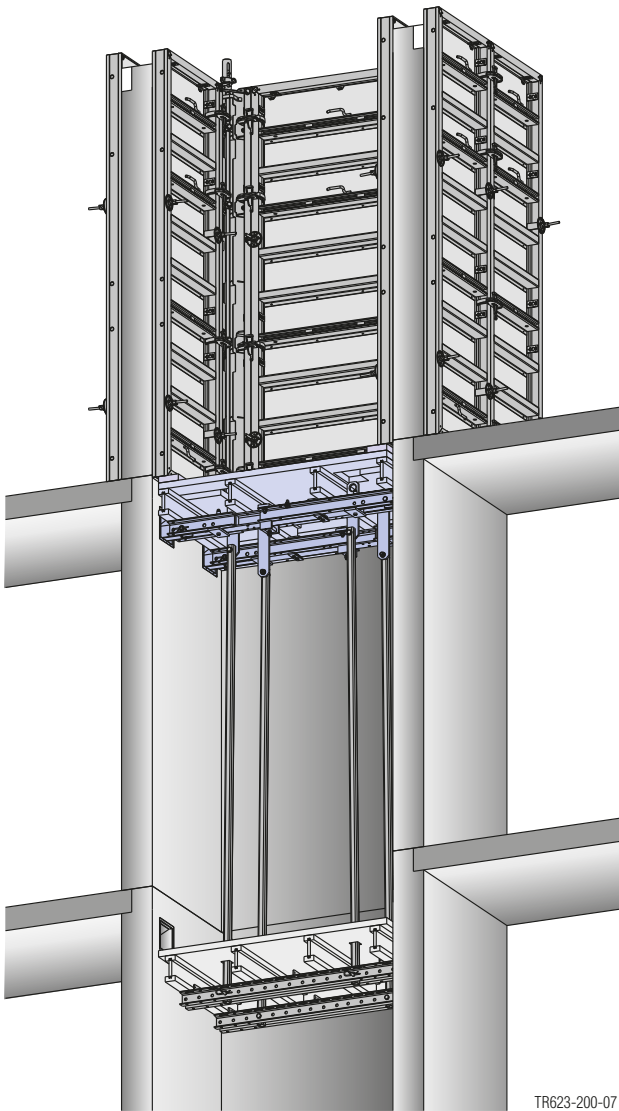


a ... > 1.00 m



Follow the directions in the 'Handrail post 1.10m' User Information!

Doka shaft platform



The climbing formwork for inside-shafts

Doka shaft platforms permit quick and easy repositioning in just one crane cycle. This makes them a cost-saving system for forming inside-shafts.

Ingenious modular system

- uses telescopic shaft beams for easy accommodation to any structure plan
- makes the system quick and easy to assemble
- facilitates attaching a follow-up platform

Easy to operate

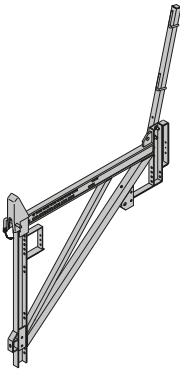
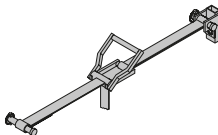
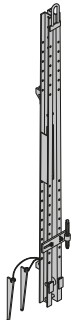

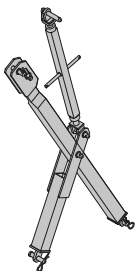
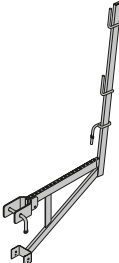
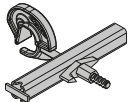
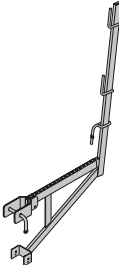
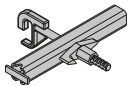
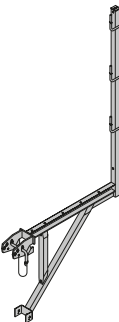
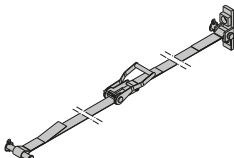
- formwork can be set up and struck quickly with no need for a crane
- cuts back on crane time by enabling fast repositioning of the entire unit (platform plus shaft formwork)

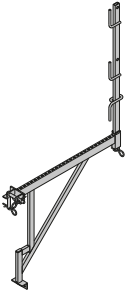

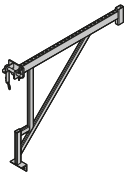
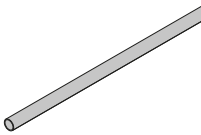


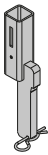
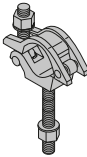
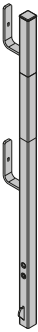



Easy mounting-system

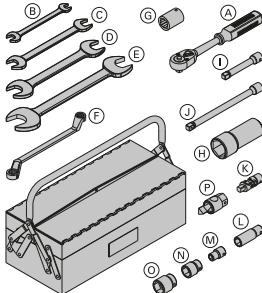
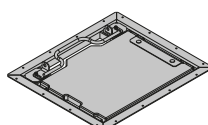
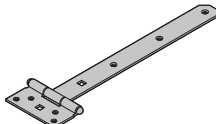
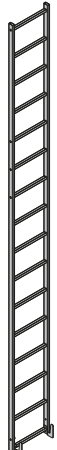


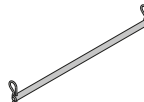
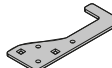
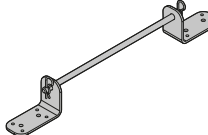
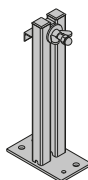
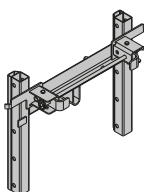
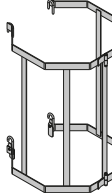
- provides maximum safety
- with either Main beam head or pawl

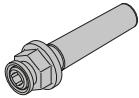

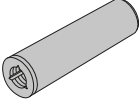
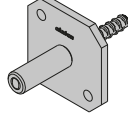


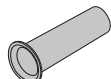

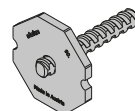
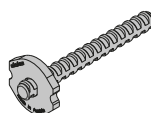

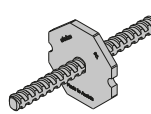
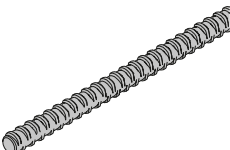

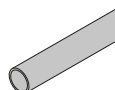




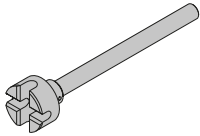
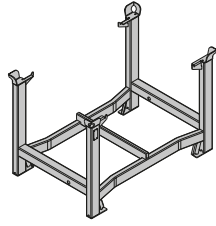
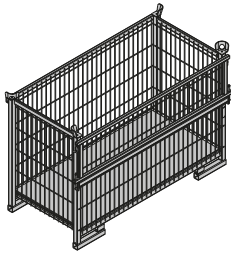
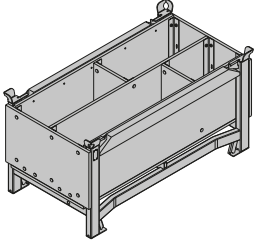
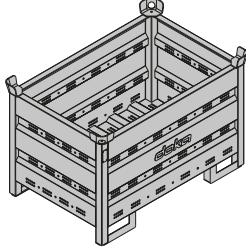
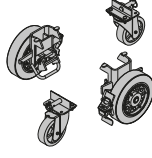
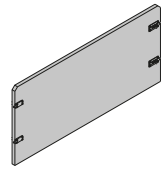
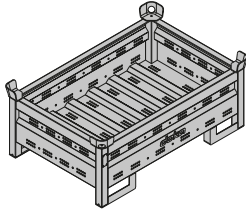
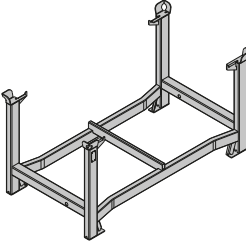
Follow the directions in the 'Shaft platform' User Information booklet.

	[kg]	Article N°		[kg]	Article N°
Climbing bracket 150 F Kletterkonsole 150 F  Galvanised Width: 173 cm Height: 255 cm	97.0	580401000	Wind bracing MF 6.00m Windabspannung MF 6,00m  Galvanised	4.3	580677000
Vertical waling 3.00m Fahrriegel 3,00m  Galvanised	84.5	580446000	Suspended platform 120 3.30m Suspended platform 120 4.30m Hängebühne 120  Galvanised Delivery condition: separate parts	44.0 52.6	580411000 580412000
Scissor-action spindle Scherenspindel  Galvanised	50.5	580455000	Top scaffold bracket L Betonierkonsole L  Galvanised Length: 101 cm Height: 159 cm	12.6	587153500
Waling-to-bracket holder 9-15cm Riegelhalter 9-15cm  Galvanised	2.7	580625000	Top scaffold bracket L painted Betonierkonsole L lackiert  Painted blue Length: 101 cm Height: 159 cm	12.0	587153000
Waling-to-bracket holder Keilriegelhalter  Galvanised Length: 26 cm Height: 31 cm	2.5	580526000	Universal bracket 90 Universal-Konsole 90  Galvanised Length: 121 cm Height: 235 cm	30.4	580476000
Wind bracing MF/150F/K 6.00m Windabspannung MF/150F/K 6,00m  Galvanised	4.7	580665000			

	[kg]	Article N°		[kg]	Article N°
Framax bracket 90 Framax-Konsole 90  <p>Galvanised Length: 103 cm Height: 185 cm Delivery condition: railing included</p>	12.5	588167000	Universal railing shackle Universal-Geländerbügel  <p>Galvanised Height: 20 cm</p>	3.0	580478000
Framax bracket 90 EP Framax-Konsole 90 EP  <p>Galvanised Length: 103 cm Height: 84 cm</p>	9.0	588979000	Scaffold tube 48.3mm 0.50m Scaffold tube 48.3mm 1.00m Scaffold tube 48.3mm 1.50m Scaffold tube 48.3mm 2.00m Scaffold tube 48.3mm 2.50m Scaffold tube 48.3mm 3.00m Scaffold tube 48.3mm 3.50m Scaffold tube 48.3mm 4.00m Scaffold tube 48.3mm 4.50m Scaffold tube 48.3mm 5.00m Scaffold tube 48.3mm 5.50m Scaffold tube 48.3mm 6.00m Scaffold tube 48.3mmm Gerüstrohr 48,3mm  <p>Galvanised</p>	1.7 3.6 5.4 7.2 9.0 10.8 12.6 14.4 16.2 18.0 19.8 21.6 3.6	682026000 682014000 682015000 682016000 682017000 682018000 682019000 682021000 682022000 682023000 682024000 682025000 682001000
Handrail post 1.00m Geländer 1,00m  <p>Galvanised Length: 124 cm</p>	3.8	584335000	Scaffold tube connection Gerüstrohranschluss  <p>Galvanised Height: 7 cm</p>	0.27	584375000
Bracket adapter XP FRR 50/30 Konsolenadapter XP FRR 50/30  <p>Galvanised Height: 32 cm</p>	2.4	586486000	Screw-on coupler 48mm 50 Screw-on coupler 48mm 95 Anschraubkupplung  <p>Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!</p>	0.84 0.88	682002000 586013000
Handrail post XP 1.20m Geländersteher XP 1,20m  <p>Galvanised Height: 118 cm</p>	4.1	586460000	Swivel coupler 48mm Drehkupplung 48mm  <p>Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!</p>	1.5	582560000
Handrail clamp S Schutzgeländerzwinge S  <p>Galvanised Height: 123 - 171 cm</p>	11.5	580470000	Warning sign "No entry" 300x300mm Verbotsschild "Zutritt Verboten" 300x300mm 	0.70	581575000

	[kg]	Article N°		[kg]	Article N°
Universal tool box 15.0 Universal-Werkzeugbox 15,0 included in scope of supply: (A) Reversible ratchet 1/2" Galvanised Length: 30 cm (B) Fork wrench 13/17 (C) Fork wrench 22/24 (D) Fork wrench 30/32 (E) Fork wrench 36/41 (F) Ring spanner 17/19 (G) Square nut 22 (H) Box spanner 41 (I) Extension 11cm 1/2" (J) Extension 22cm 1/2" (K) Universal joint coupling 1/2" (L) Box nut 19 1/2" L (M) Box nut 13 1/2" (N) Box nut 24 1/2" (O) Box nut 30 1/2" (P) Positioning cone spanner 15.0 DK Galvanised Length: 8 cm Width-across: 30 mm	9.1	580392000			
	0.73	580580000			
	0.08	580577000			
	0.22	580587000			
	0.80	580897000			
	1.0	580586000			
	0.27	580590000			
	0.31	580589000			
	0.99	580585000			
	0.20	580581000			
	0.31	580582000			
	0.16	580583000			
	0.16	580598000			
	0.06	580576000			
	0.12	580584000			
	0.20	580575000			
	0.30	580579000			
Ladder system XS					
Manhole B 70/60cm Bühnendurchstieg B 70/60cm  Steel parts galvanised Timber parts varnished yellow Length: 81 cm Width: 71 cm	22.0	581530000			
Cover hinge SK 35cm Deckelscharnier SK 35cm  Galvanised	0.30	581533000			
System ladder XS 4.40m System-Leiter XS 4,40m  Galvanised	33.2	588640000			
			Ladder extension XS 2.30m Leiternverlängerung XS 2,30m  Galvanised	19.1	588641000
			Ladder clamp SK Leiternklemme SK  Galvanised Length: 8 cm	0.23	581239000
			Ladder bolt XS Leiternbolzen XS  Galvanised Length: 51 cm	0.85	581561000
			Ladder holder SK Leiternhalter SK  Galvanised	0.36	581532000
			Ladder adapter SK Leiternfuß SK  Galvanised	2.3	581531000
			Ladder adapter XS Leiternfuß XS  Galvanised Height: 50 cm	5.0	588673000
			Connector XS Wall formwork Anschluss XS Wandschalung  Galvanised Width: 89 cm Height: 63 cm	20.8	588662000
			Ladder cage XS 1.00m Ladder cage XS 0.25m Rückenschutz XS  Galvanised	16.5 10.5	588643000 588670000

	[kg]	Article N°		[kg]	Article N°
Tie rod system 15.0					
Climbing cone 15.0 5cm Kletterkonus 15,0 5cm	0.97	581980000		Pigtail anchor 15.0 Wellenanker 15,0	0.92 581984000
			Galvanised Length: 17 cm Diameter: 6 cm Width-across: 41 mm Follow the directions in the "Fitting instructions"!		Non-treated Length: 67 cm
Positioning cone 15.0 5cm Vorlaufkonus 15,0 5cm	0.43	581969000		Wall anchor 15.0 15cm Wandanker 15,0 15cm	1.5 581893000
			Galvanised Length: 11 cm Diameter: 3 cm Follow the directions in the "Fitting instructions"!		Galvanised
Sealing sleeve 15.0 5cm Dichtungshülse 15,0 5cm	0.008	581990000		<div><div><div></div><div>DIN</div><div>18216</div></div><div><div></div><div>DIN</div><div>18216</div></div></div>	
			Orange Length: 10 cm Diameter: 3 cm		
Cantilever positioning cone 15.0 5cm Sperrenvorlauf 15,0 5cm	0.45	581699000			
			Length: 11 cm Diameter: 5 cm Follow the directions in the "Fitting instructions"!		
Sealing sleeve S 15.0 5cm Dichtungshülse S 15,0 5cm	0.009	581697000			
			Orange Length: 11 cm Diameter: 4.7 cm		
Fixing plate 15.0 Nagelblech 15,0	0.15	581692000			
			Galvanised Diameter: 10 cm		
Stop anchor 15.0 B11 Sperranker 15,0 B11	0.55	581868000			
			Non-treated		
Stop anchor 15.0 A16 Sperranker 15,0 A16	0.38	581997000			
			Non-treated		
Stop anchor 15.0 A40 Sperranker 15,0 A40	0.71	581999000			
			Non-treated		
Stop anchor double-ended 15.0 K20 Sperranker beidseitig 15,0 K20	0.76	581820000			
			Non-treated Custom lengths can be ordered under the special-component Art.n° 580100000, quoting the designation and the desired length in mm.		
			Tie rod 15.0mm galvanised 0.50m	0.72	581821000
			Tie rod 15.0mm galvanised 0.75m	1.1	581822000
			Tie rod 15.0mm galvanised 1.00m	1.4	581823000
			Tie rod 15.0mm galvanised 1.25m	1.8	581826000
			Tie rod 15.0mm galvanised 1.50m	2.2	581827000
			Tie rod 15.0mm galvanised 1.75m	2.5	581828000
			Tie rod 15.0mm galvanised 2.00m	2.9	581829000
			Tie rod 15.0mm galvanised 2.50m	3.6	581852000
			Tie rod 15.0mm galvanisedm	1.4	581824000
			Tie rod 15.0mm non-treated 0.50m	0.73	581870000
			Tie rod 15.0mm non-treated 0.75m	1.1	581871000
			Tie rod 15.0mm non-treated 1.00m	1.4	581874000
			Tie rod 15.0mm non-treated 1.25m	1.8	581886000
			Tie rod 15.0mm non-treated 1.50m	2.1	581876000
			Tie rod 15.0mm non-treated 1.75m	2.5	581887000
			Tie rod 15.0mm non-treated 2.00m	2.9	581875000
			Tie rod 15.0mm non-treated 2.50m	3.6	581877000
			Tie rod 15.0mm non-treated 3.00m	4.3	581878000
			Tie rod 15.0mm non-treated 3.50m	5.0	581888000
			Tie rod 15.0mm non-treated 4.00m	5.7	581879000
			Tie rod 15.0mm non-treated 5.00m	7.2	581880000
			Tie rod 15.0mm non-treated 6.00m	8.6	581881000
			Tie rod 15.0mm non-treated 7.50m	10.7	581882000
			Tie rod 15.0mm non-treatedm	1.4	581873000
			Ankerstab 15,0mm		
					
			Super plate 15.0 Superplatte 15,0	1.1	581966000
				Galvanised Height: 6 cm Diameter: 12 cm Width-across: 27 mm	
			Plastic tube 22mm 2.50m Kunststoffrohr 22mm 2,50m	0.45	581951000
				PVC Grey Diameter: 2.6 cm	
			Universal cone 22mm Universal-Konus 22mm	0.005	581995000
				Grey Diameter: 4 cm	
			Protective cap 15.0/20.0 Schutzkappe 15,0/20,0	0.03	581858000
				Yellow Length: 6 cm Diameter: 6.7 cm	

	[kg]	Article N°		[kg]	Article N°
Tie-rod wrench 15.0/20.0 Ankerstabschlüssel 15,0/20,0  <p>Galvanised Length: 37 cm Diameter: 8 cm</p>	1.9	580594000	Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m  <p>Galvanised Height: 77 cm</p>	38.0	583016000
Multi-trip packaging					
Doka skeleton transport box 1.70x0.80m Doka-Gitterbox 1,70x0,80m  <p>Galvanised Height: 113 cm</p>	87.0	583012000	Doka accessory box Doka-Kleinteilebox  <p>Timber parts varnished yellow Steel parts galvanised Length: 154 cm Width: 83 cm Height: 77 cm</p>	106.4	583010000
Doka multi-trip transport box 1.20x0.80m Doka-Mehrwegcontainer 1,20x0,80m  <p>Galvanised Height: 78 cm</p>	70.0	583011000	Bolt-on castor set B Anklemm-Radsatz B  <p>Painted blue</p>	33.6	586168000
Multi-trip transport box partition 0.80m Multi-trip transport box partition 1.20m Mehrwegcontainer Unterteilung  <p>Steel parts galvanised Timber parts varnished yellow</p>	3.7 5.5	583018000 583017000			
Doka multi-trip transport box 1.20x0.80x0.41m Doka-Mehrwegcontainer 1,20x0,80x0,41m  <p>Galvanised</p>	42.5	583009000			
Doka stacking pallet 1.55x0.85m Doka-Stapelpalette 1,55x0,85m  <p>Galvanised Height: 77 cm</p>	41.0	586151000			



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