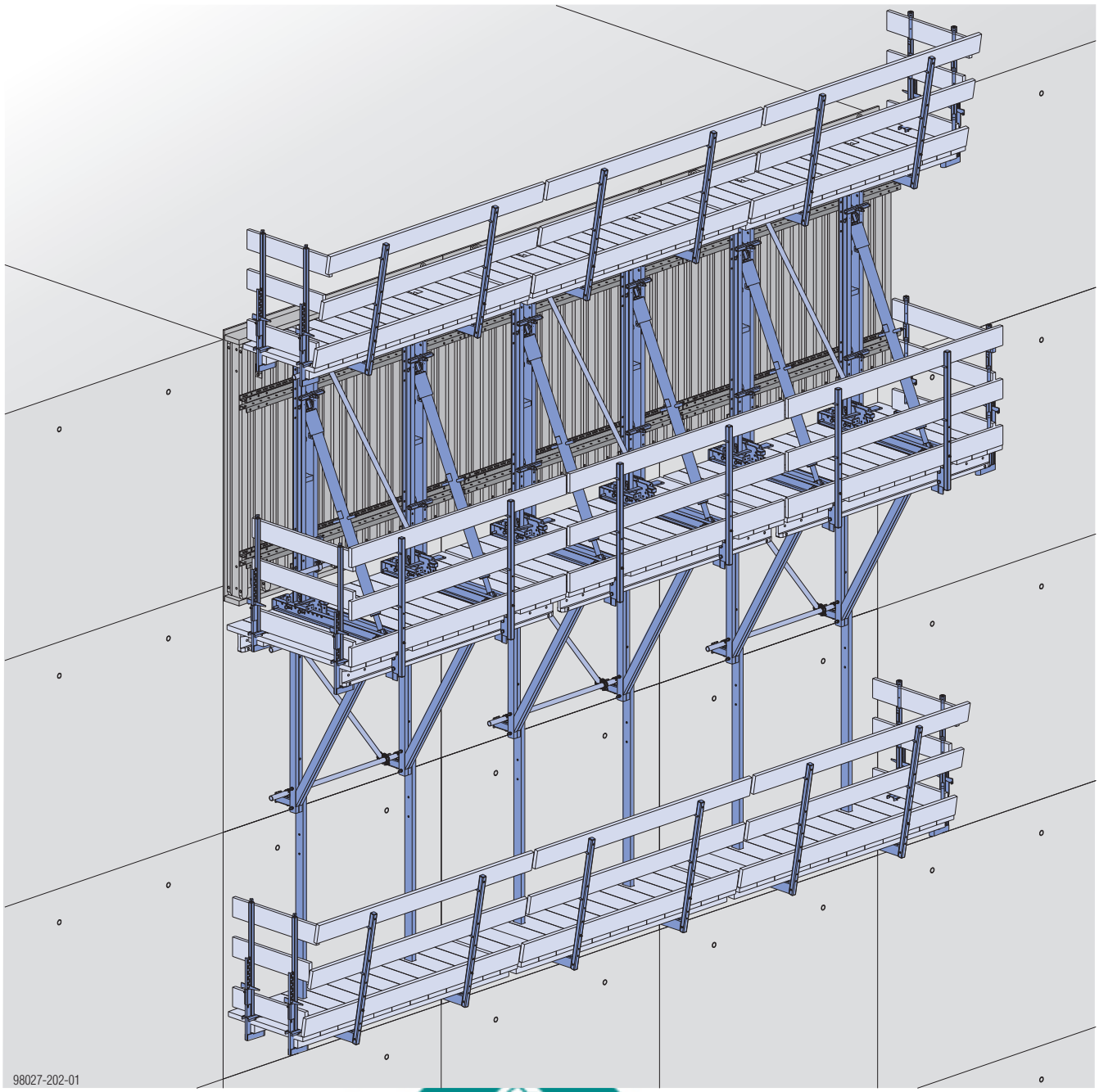
The Formwork Experts.

Dam formwork D15

User Information

Instructions for assembly and use (Method statement)



Contents

Elementary safety warnings

User target groups

- This manual 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 manual 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 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 rules 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 document 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.

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.**

Remarks on this document

- This manual can also be used as a generic method statement or incorporated with a site-specific method statement.
- **Many of the illustrations in this booklet show the situation during formwork assembly and are therefore not always complete from the safety point of view.**
  Any safety accessories not shown in these illustrations must still be used by the customer, in accordance with the applicable rules and regulations.
- **Further safety instructions, especially warnings, will be found in the individual sections of this document!**

Symbols used

The following symbols are used in this booklet:

Important note
Failure to observe this may lead to malfunction or damage.

CAUTION / WARNING / DANGER
Failure to observe this may lead to material damage, and to injury to health which may range up to the severe or even life-threatening.

Instruction
This symbol indicates that actions need to be taken 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
Refers to other documents and materials.

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 of all components and units must be ensured during all phases of the construction work!
- The functional/technical instructions, safety warnings and loading data must all be strictly observed and complied with. Failure to do so can cause accidents and severe (even life-threatening) damage to health, as well as very great material damage.
- Fire-sources are not permitted anywhere near the formwork. Heating appliances are only allowed if properly and expertly used, and set up a safe distance away from the formwork.
- The work must take account of the weather conditions (e.g. risk of slippage). In extreme weather, steps must be taken in good time to safeguard the equipment, and the immediate vicinity of the equipment, and to protect employees.
- All connections must be checked regularly to ensure that they still fit properly and are functioning correctly.
  It is very important to check all screw-type connections and wedge-clamped joins whenever the construction operations require (particularly after exceptional events such as storms), and to tighten them if necessary.

Assembly

- The equipment/system must be inspected by the customer before use, to ensure that it is in suitable condition. Steps must be taken to rule out the use of any components that are damaged, deformed, or weakened due to wear, corrosion or rot.
- Combining our formwork systems with those of other manufacturers could be dangerous, risking damage to both health and property. If you intend to combine different systems, please contact Doka for advice first.
- The equipment/system must be assembled and erected in accordance with the applicable laws, Standards and rules by suitably skilled personnel of the customer's, having regard to any and all required safety inspections.
- It is not permitted to modify Doka products; any such modifications constitute a safety risk.

Erecting 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.

Striking the formwork

- Do not strike the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be struck!
- When striking 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 striking 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 regulations applying to the handling of formwork and scaffolding. In addition, the Doka slinging means must be used - this is a mandatory requirement.
- Remove any loose parts or fix them in place so that they cannot be dislodged or fall free!
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this manual!

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.

Maintenance

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

Miscellaneous

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

Eurocodes at Doka

In Europe, a uniform series of Standards known as **Eurocodes** (EC) was developed for the construction field by the end of 2007. These are intended to provide a uniform basis, valid throughout Europe, for product specifications, tenders and mathematical verification.

The EC are the world's most highly developed Standards in the construction field.

In the Doka Group, the EC are to be used as standard from the end of 2008. They will thus supersede the DIN norms as the "Doka standard" for product design.

The widely used "Permissible stress design" (comparing the actual stresses with the permissible stresses) has been superseded by a new safety concept in the EC.

The EC contrast the actions (loads) with the resistance (capacity). The previous safety factor in the permissible stresses is now divided into several partial factors. The safety level remains the same!

$$E_d \leq R_d$$

E_d **Design value of effect of actions**
(E ... effect; d ... design)
Internal forces from action F_d
(V_{Ed}, N_{Ed}, M_{Ed})

F_d **Design value of an action**
$F_d = \gamma_F \cdot F_k$
(F ... force)

F_k **Characteristic value of an action**
"actual load", service load
(k ... characteristic)
e.g. dead weight, live load, concrete pressure, wind

γ_F **Partial factor for actions**
(in terms of load; F ... force)
e.g. for dead weight, live load, concrete pressure, wind
Values from EN 12812

R_d **Design value of the resistance**
(R ... resistance; d ... design)
Design capacity of cross-section
(V_{Rd}, N_{Rd}, M_{Rd})

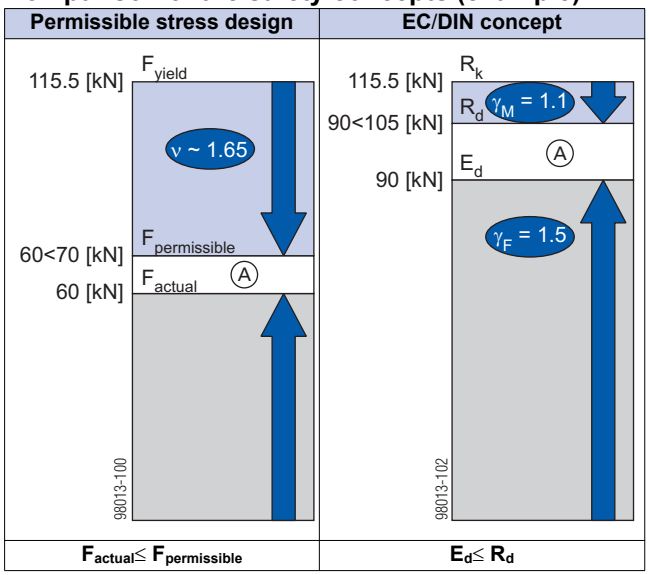
Steel: $R_d = \frac{R_k}{\gamma_M}$ Timber: $R_d = k_{mod} \cdot \frac{R_k}{\gamma_M}$

R_k **Characteristic value of the resistance**
e.g. moment resistance to yield stress

γ_M **Partial factor for a material property**
(in terms of material; M...material)
e.g. for steel or timber
Values from EN 12812

k_{mod} **Modification factor** (only for timber – to take account of the moisture and the duration of load action)
e.g. for Doka beam H20
Values as given in EN 1995-1-1 and EN 13377

Comparison of the safety concepts (example)



A Utilisation factor

The "permissible values" communicated in Doka documents (e.g.: $Q_{permissible}$ = 70 kN) do not correspond to the design values (e.g.: V_{Rd} = 105 kN)!

- Avoid any confusion between the two!
- Our documents will continue to state the permissible values.

Allowance has been made for the following partial factors:
$\gamma_F = 1.5$
$\gamma_{M,\ timber} = 1.3$
$\gamma_{M,\ steel} = 1.1$
$k_{mod} = 0.9$

In this way, all the design values needed in an EC design calculation can be ascertained from the permissible values.

Doka services

Support in every stage of the project

Doka offers a broad spectrum of services, all with a single aim: to help you succeed on the site.

Every project is unique. Nevertheless, there is one thing that all construction projects have in common – and that is a basic structure with five stages. We at Doka know our clients' varying requirements. With our consulting, planning and other services, we help you achieve effective implementation of your formwork assignment using our formwork products – in every one of these stages.

Project Development Stage

Taking well-founded decisions thanks to professional advice and consulting

Find precisely the right formwork solutions, with the aid of

- help with the bid invitation
- in-depth analysis of the initial situation
- objective evaluation of the planning, execution, and time-risks

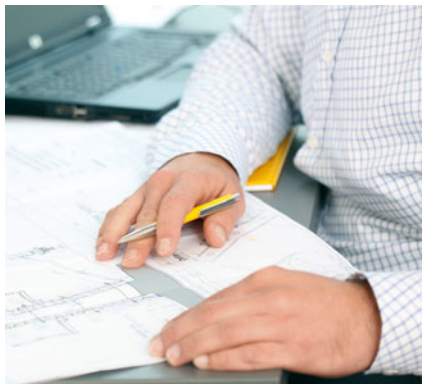
Bidding Stage

Optimising the preliminary work with Doka as an experienced partner

Draw up potentially winning bids, by

- basing them on realistically calculated guideline prices
- making the right formwork choices
- having an optimum time-calculation basis

Project Management Planning Stage



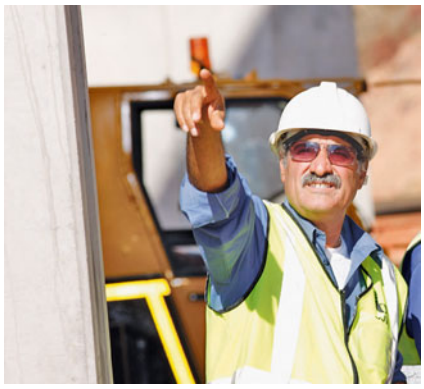
Controlled, regular forming operations, for greater efficiency resulting from realistically calculated formwork concepts

Plan cost-effectively right from the outset, thanks to

- detailed offers
- determination of the commissioning quantities
- co-ordination of lead-times and handover deadlines

4

Concrete Construction Stage



Optimum resource utilisation
with assistance from the Doka Formwork Experts

Workflow optimisation, thanks to
- thorough utilisation planning
- internationally experienced project technicians
- appropriate transport logistics
- on-site support

5

Project Close-out Stage

Seeing things through to a positive conclusion
with professional support

Doka Services are a byword for transparency and efficiency here, offering
- jointly handled return of rented formwork
- professional dismantling
- efficient cleaning and reconditioning using special equipment

The advantages for you
thanks to professional advice and consulting

- **Cost savings and time gains**
  When we advise and support you right from the word "go", we can make sure that the right formwork systems are chosen and then used as planned. This lets you achieve optimum utilisation of the formwork equipment, and effective forming operations because your workflows will be correct.
- **Maximised workplace safety**
  The advice and support we can give you in how to use the equipment correctly, and as planned, leads to greater safety on the job.
- **Transparency**
  Because our services and costs are completely transparent, there is no need for improvisation during the project – and no unpleasant surprises at the end of it.
- **Reduced close-out costs**
  Our professional advice on the selection, quality and correct use of the equipment helps you avoid damage, and minimise wear-and-tear.

System description

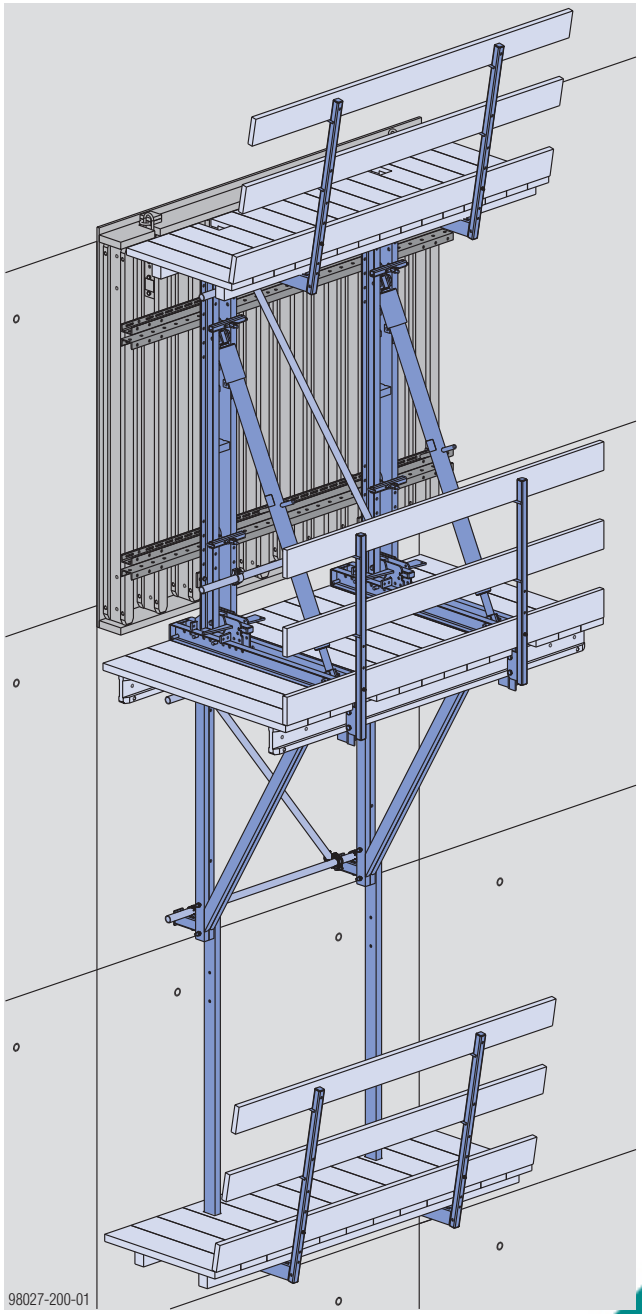
Dam formwork D15

On mass concrete structures, it is not normally feasible to place form-ties through to the opposing formwork. For this reason, the pressure of the fresh concrete has to be transferred into the previous concrete block. Doka dam formwork ensures that the forces which occur here are transferred safely and reliably.

This dam formwork system adapts easily to **inclined wall zones** and to **kinks in the walls**.

The formwork and the dam scaffold are raised jointly from one casting section to the next.

The Doka dam formwork system is extremely flexible. For this reason, detailed planning and static calculations are required for every single project.



Product features

- anchor tensile force: 150 kN
- easy to anchor
- formwork elements are freely selectable
- easy angle adjustment
- accurate, easy-to-use height adjustment
- pre-assembly of platform decking is possible
- generously sized workspace and access passage
- formwork is pressed onto the previous casting section quickly and securely
- only a small number of different parts

2 versions

Dam formwork D15 K

When tilted backwards, the formwork leaves plenty of space for preparing the suspension points. The platform is wide enough to make it easy to operate the spindle strut. There is also enough space for operators to pass behind the spindle strut.

- optimised for a block height of 2.5 m
- platform width 1.7 m
- formwork is tiltable

Dam formwork D15/3

The Dam formwork D15/3 system is the optimum dam scaffold for **block heights of 3.0 m**. The extra-wide platform gives the crew plenty of room to move.

The Dam formwork D15/3 can easily be modified to equip it with a travelling unit. This makes the formwork retractable as well.

- optimised for a block height of 3.0 m
- platform width 2.2 m
- formwork is tiltable, and can also be modified to make it retractable

Areas of use

- River dams and barrages
- River power plants
- Locks
- Piers and pylons
- Single-sided walls

Other dam formwork systems

For optimum adaptation to every construction project, Doka offers several different dam formwork systems, all of which always use the same method of working:

Dam formwork D12

- anchor tensile force: 120 kN
- block heights of up to 2.0 m
  block heights of up to 2.70 m where the RCC method is used
- formwork is tiltable

Dam formwork D22

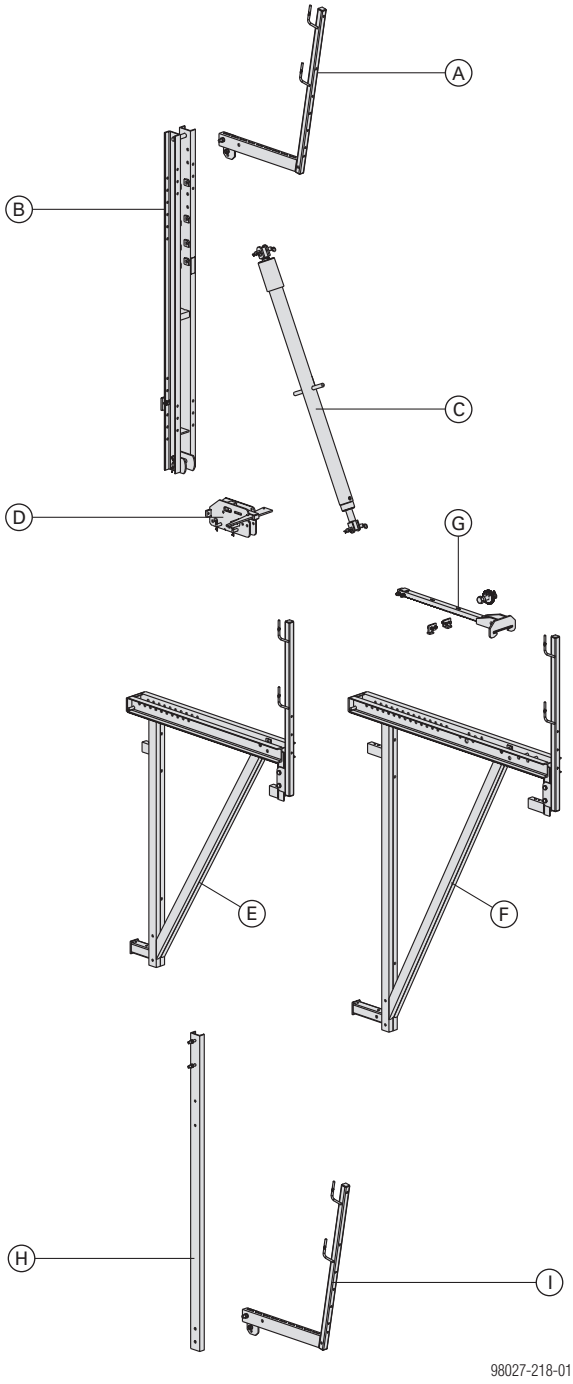
- anchor tensile force: 220 kN
- block heights of up to 4.0 m
- formwork is tiltable or retractable

Dam formwork D35

- anchor tensile force: 350 kN
- block heights of up to 5.0 m
- formwork is tiltable

Follow the directions in the relevant User Information booklet!

System overview



A	Screw-on access bracket MF75 or the platform system of the formwork being used
B	Vertical waling D15 3.00m U120 or Vertical waling D15 3.50m U140
C	Spindle strut D15 3.00m
D	Swivel bearing plate D15 or Swivel bearing plate D15 S
E	Cantilever bracket D15 K
F	Cantilever bracket D15/3
G	Retraction set D15
H	Suspension profile D15/D22
I	Screw-on access bracket MF75

Pouring platform

There are 2 options to choose from:

- **Screw-on access bracket MF75 (A)**
  - The Screw-on access bracket MF75 is mounted directly to the Vertical waling.
  - On sloping walls, the inclination of the platform can be adjusted with the Swivel plate MF.
- **The platform system of the formwork being used**

Vertical-waling unit

- **Vertical waling D15 3.00m U120** or **3.50m U140 (B)**
  The vertical waling is for holding and adjusting the formwork element, and for transferring the concrete forces into the cantilever bracket.
- **Spindle strut D15 3.00m (C)**
  This is bolted in between the cantilever bracket and the vertical waling. It has the job of transferring the concrete forces, and is also used for plumbing and striking the formwork elements.
- **Swivel bearing plate D15** or **D15 S (D)**
  The Swivel bearing plate makes it possible to connect the Vertical waling to the Cantilever bracket with a rigid, force-transmitting join. The articulated joint makes it possible to incline the Vertical waling forward and back.
  - **D15**: for use with timber-beam and framed formwork systems
  - **D15 S**: for use with framed and steel formwork systems

Working platform

The **Cantilever bracket** is used for constructing the main working platform, and carries the formwork element or panel.

The pressure of the fresh concrete is transferred by way of the suspension point and the pressure-brace.

- **Cantilever bracket D15 K (E)**
  - optimised for a block height of 2.5 m
- **Cantilever bracket D15/3 (F)**
  - optimised for a block height of 3.0 m

Suspended platform

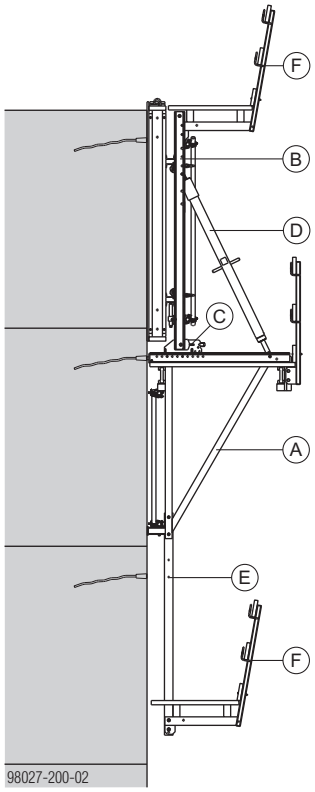
Consisting of:

- **Suspension profile D15/D22 (H)**
- **Screw-on access bracket MF75 (I)**

Areas of use

The flexibility of Doka dam formwork D15 gives it a very wide spectrum of use. It can master all manner of different wall sequences:

Straight walls

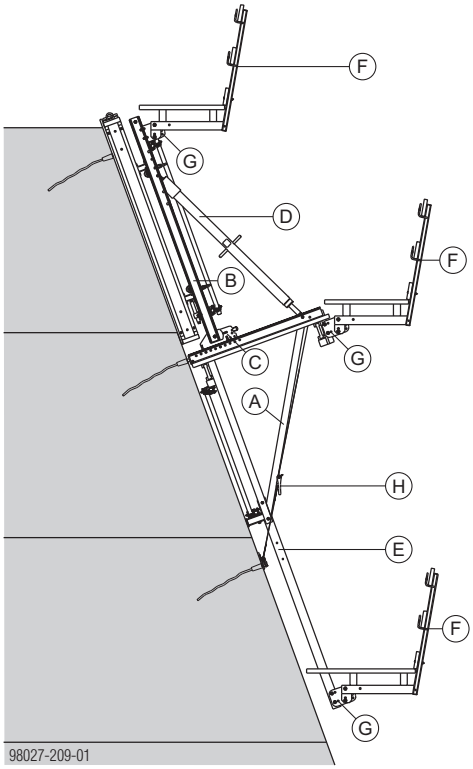


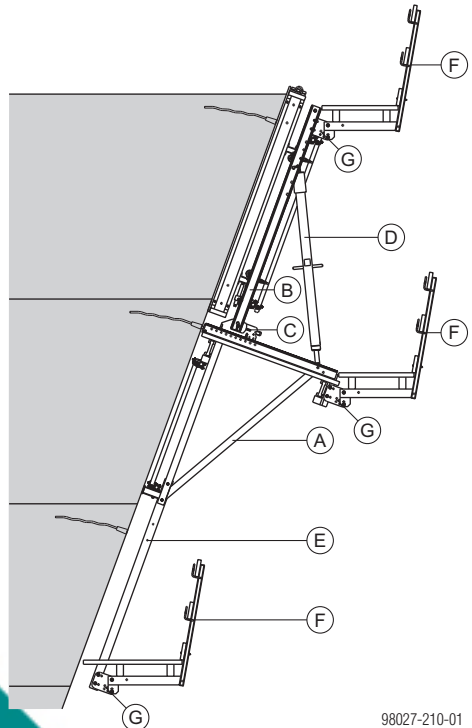
A	Cantilever bracket D15
B	Vertical waling D15
C	Swivel bearing plate D15
D	Spindle strut D15 3.00m
E	Suspension profile D15/D22
F	Screw-on access bracket MF75
G	Swivel plate MF
H	Tension-rod brace (a project-specific check must be made to determine whether this is needed)

Inclined wall

Important note:

- The diagrams shown in the 'Structural design' chapter are not valid for inclined usage situations. In these cases, revised static verification is required.
- If it is intended to use a retractable formwork unit on inclined walls, this must be reviewed separately.





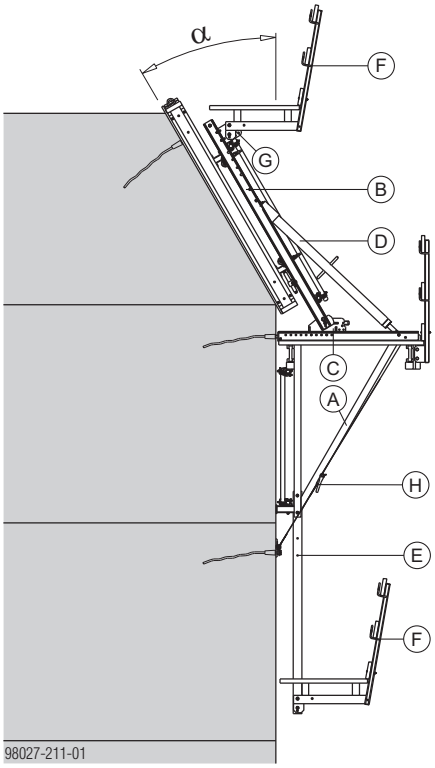
Kink in wall

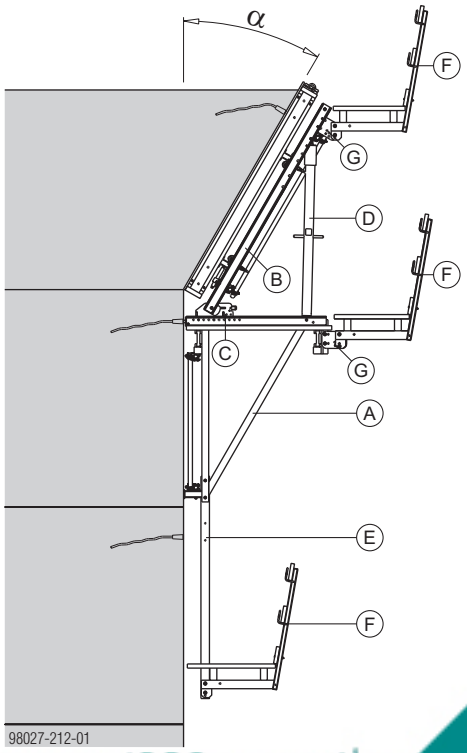
Important note:

The diagrams shown in the 'Structural design' chapter are not valid for inclined usage situations. In these cases, revised static verification is required.

Note:

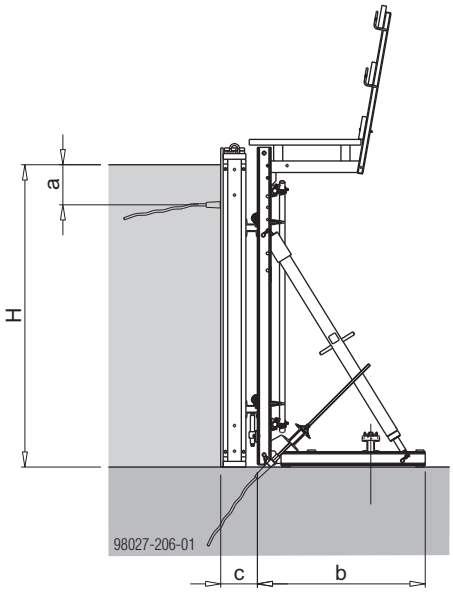
The max. angle of inclination α will depend on the project, and in particular on the constructional height of the formwork system that is being used.





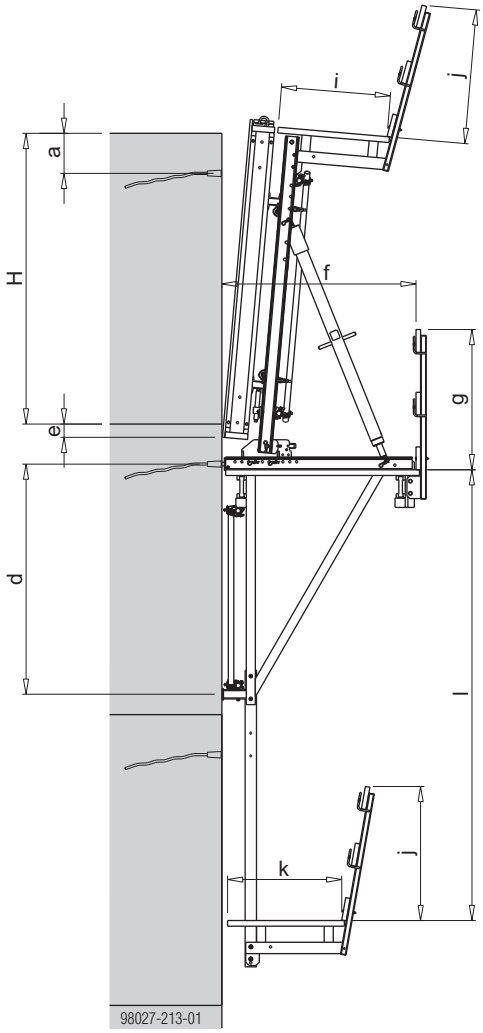
System dimensions

Starter-block formwork



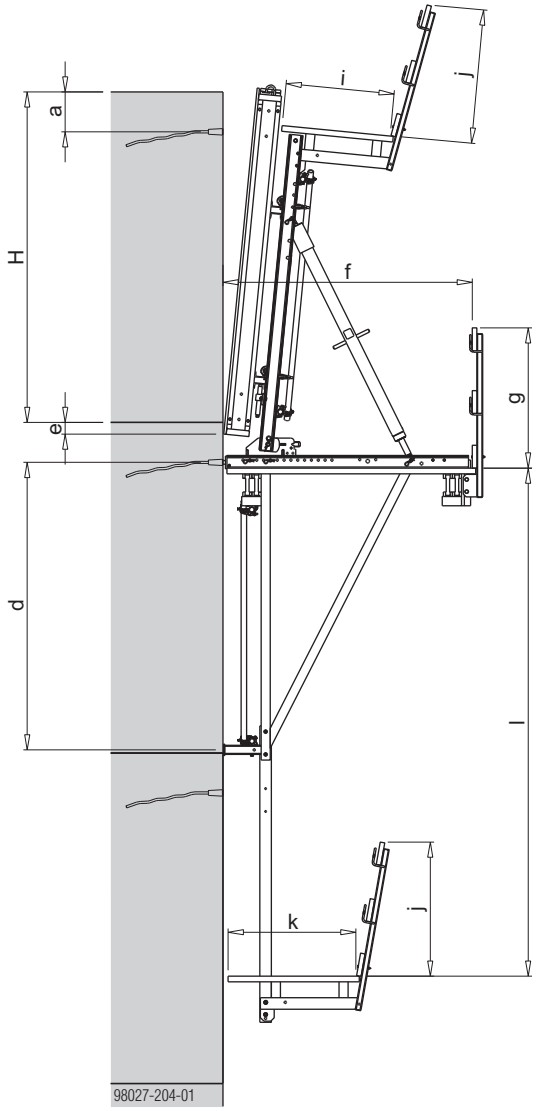
Dam formwork D15 K

The formwork can be tilted back to leave plenty of space for preparing the suspension point.



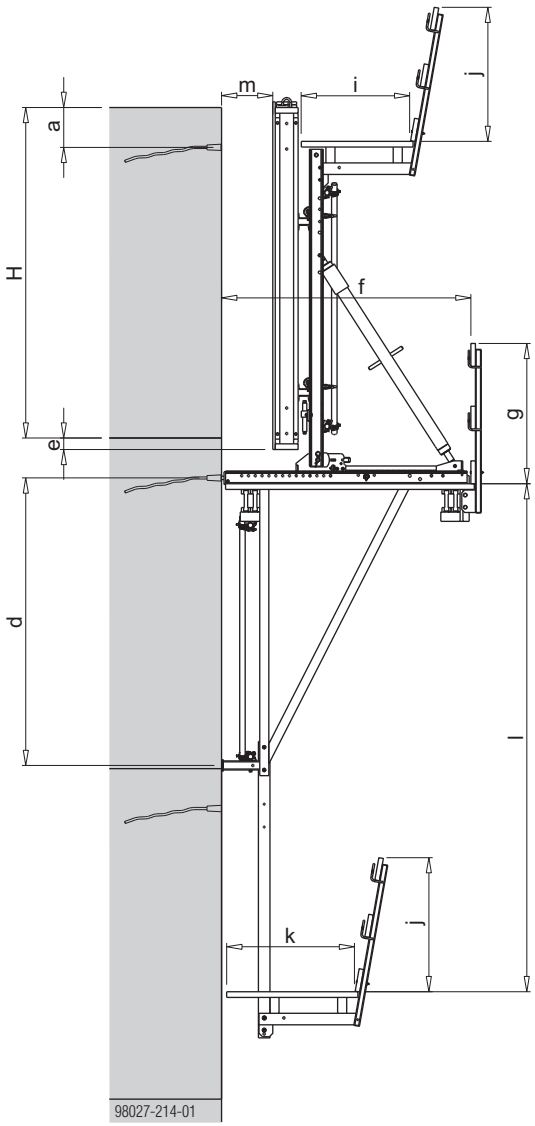
Dam formwork D15/3 - tiltable

The formwork can be tilted back to leave plenty of space for preparing the suspension point.



Dam formwork D15/3 - retractable

The D15/3 is tiltable as standard. The Dam formwork D15/3 can easily be modified to equip it with a travelling unit. This makes the formwork retractable as well.



System dimensions [mm]

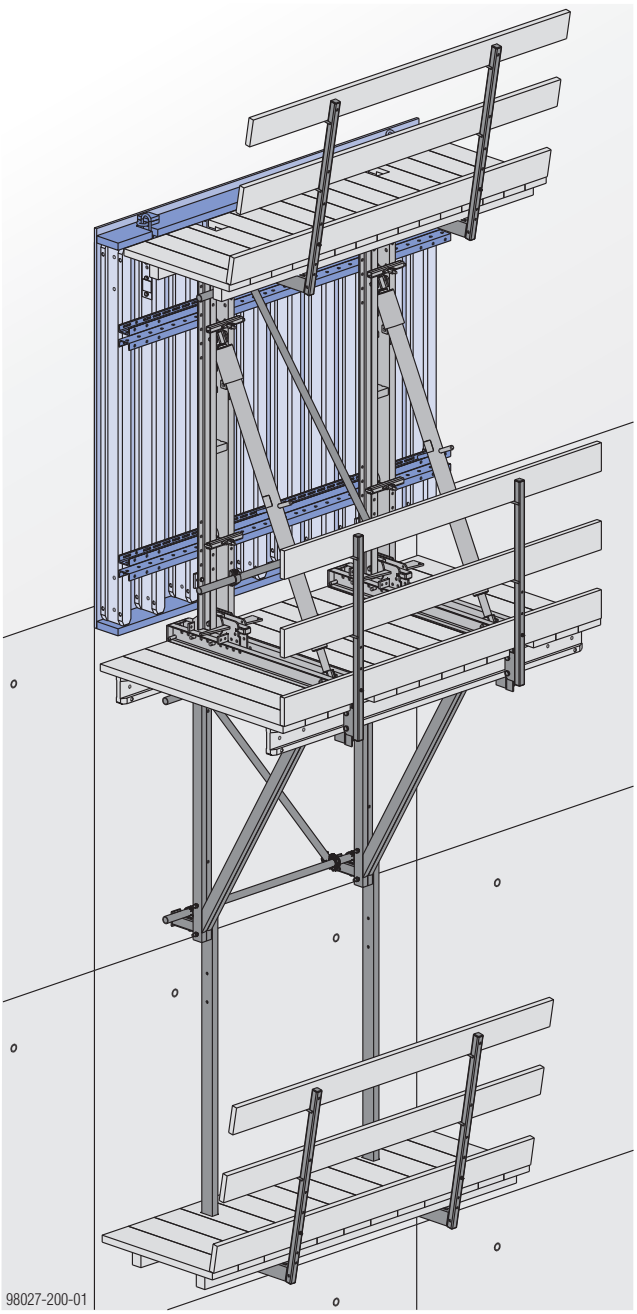
		Type of bracket		
		D15 K	D15/3 - tiltable	D15/3 - retractable
H	Block height	2500	3000	
a	Distance between top of poured concrete and anchoring point	350		
b	Width of Starter-block unit + Vertical waling	1470		
c	Constructional height of formwork	321 [1] / 223 [2]		
d	Distance between suspension point and pressure strut	2020	2520	
e	Formwork overlap	100		
f	Width of bracket	1700	2190	
g	Height of railings on bracket	1230		
i	Width of pouring platform	950		
j	Height of railings on pouring platform / suspended platform	1170		
k	Width of suspended platform	1000	1130	
l	Distance between bracket and suspended platform	Either 3450 or 3950	Either 3950 or 4450	
m	Distance between formwork and concrete	---	---	max. 450 [1] / 550 [2]

[1] with Large-area formwork Top 50
[2] with Framed formwork Framax Xlife

Possible formwork systems

Timber-beam formwork

e.g. Large-area formwork Top 50



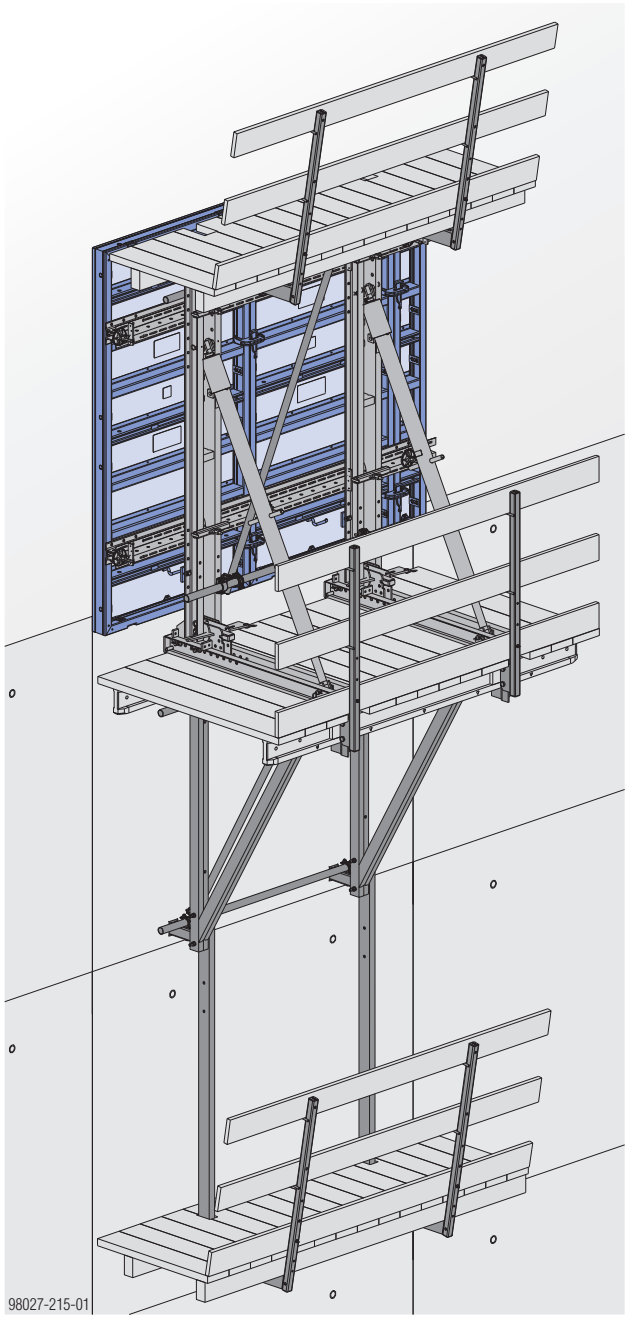
For more information, see the 'Timber-beam formwork Top 50' User Information booklet.

Steel formwork

Steel formwork must always be planned and dimensioned on a project-specific basis.

Framed formwork

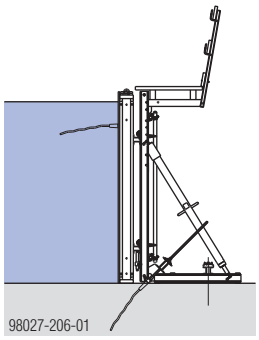
e.g. framed formwork Framax Xlife



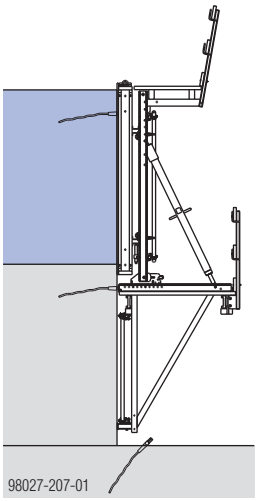
For more information, see the 'Framed formwork Framax Xlife' User Information booklet.

Schematic workflow of climbing phases

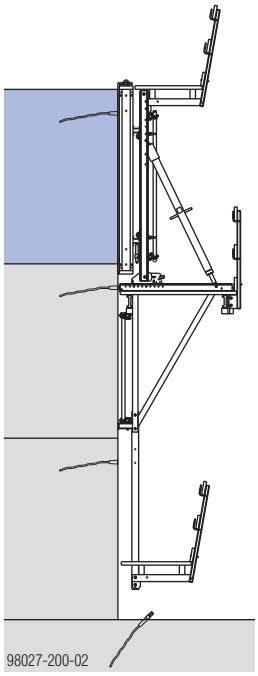
Start-up phases



The 1st casting section is poured using Starter-block units or with Doka supporting construction frames.

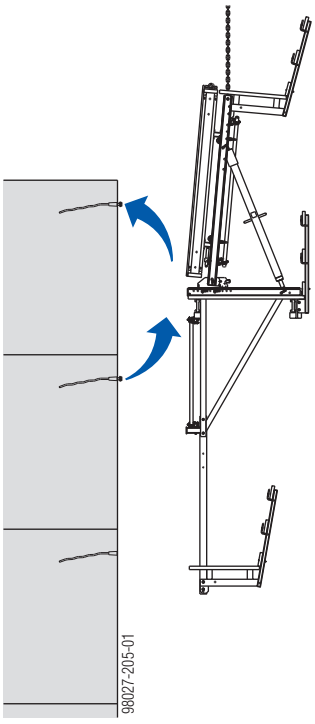


The 2nd casting section (and all further sections) are poured using the climbing scaffold.

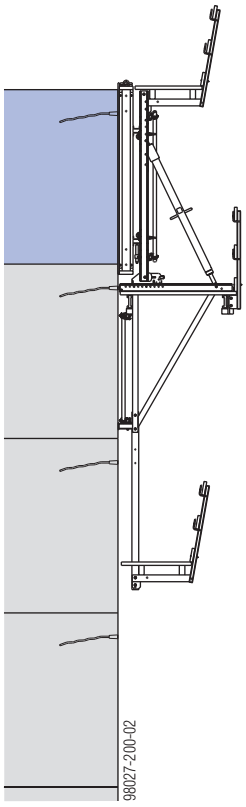


The suspended platforms are mounted, and then the 3rd section is poured.

Typical phases



The climbing scaffold is raised to the next casting section.

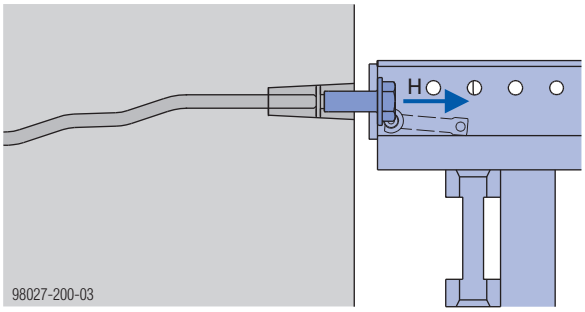


The next casting section is poured.

Structural design

Loading data

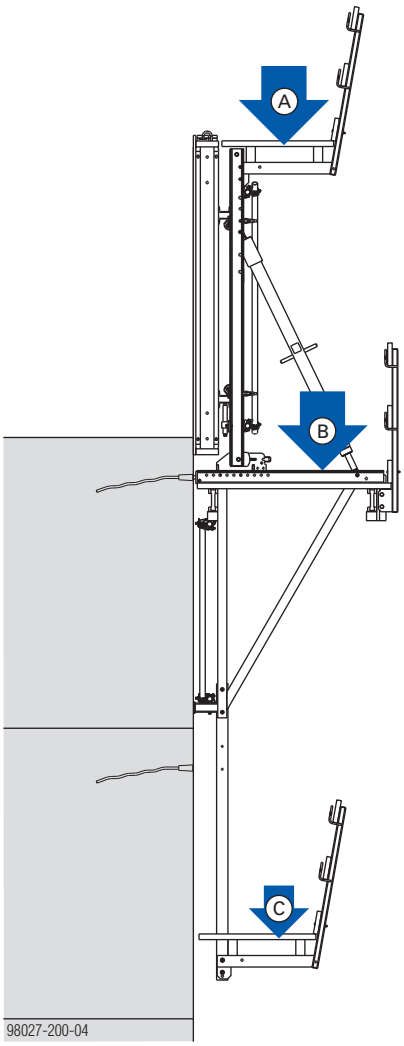
Imposed loads



H ... permitted horizontal load: 150 kN

In standard applications with the dam formwork, the vertical loads occurring at the suspension point are very small and so do not need to be taken into consideration.

Service loads



A	150 kg/m²
B	150 kg/m²
C	75 kg/m²

Structural design

The distances between the brackets and Starter-block units are calculated from various different influences:

- Pressure of fresh concrete
- Block height
- Angle of inclination of formwork
- Wind loads

This is why dam formwork must always be dimensioned on a project-specific basis.

Allow for the following when performing the structural design calculations:

The formwork used must be dimensioned as necessitated by the centre-distance of the brackets (e.g. the correct multipurpose walings must be selected).

Max. service load of the working platform: 1.5 kN/m² (incl. loads occurring as a result of pouring)

When determining the pressure of the fresh concrete, allow for the following:

- Additional loads from concrete spreading devices (e.g. caterpillar concrete spreader).
- Slow setting of the concrete (fly-ash))
- Low concrete temperature (cooled concrete)
- Low proportion of cement in the concrete

CAUTION

There is a risk of the formwork tipping over **in high winds**.

➤ If high wind speeds 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:

Wedge the formwork against the concrete.

For more information (wind loads etc.) see the section headed 'Vertical and horizontal loads' in the Calculation Guide 'Doka formwork engineering'.

Important note:

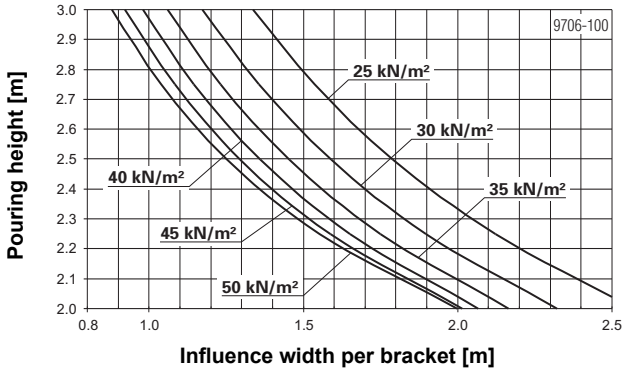
The diagrams given here are for preliminary dimensioning only, and only apply to standard assignments on straight walls.

The Cantilever bracket, Vertical waling and Spindle strut must be reviewed separately for each project.

Dam formwork D15 K

Anchor tensile force: 150 kN

- **Tie-rod system 20.0:**
  2.3 : 1 factor of safety against steel failure
- **Tie-rod system 26.5:**
  3.7 : 1 factor of safety against steel failure

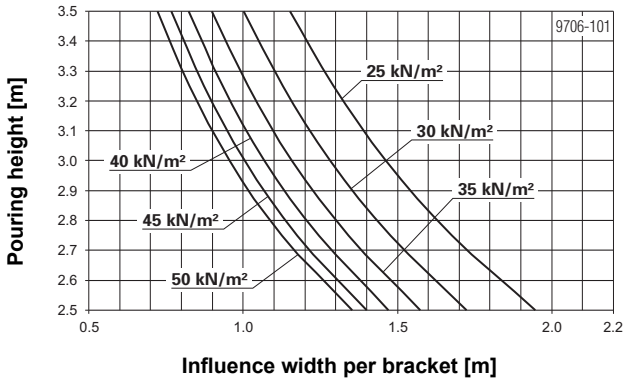


The values in the diagram apply for a distance of 350 mm between the top of the concrete and the anchoring point.

Dam formwork D15/3

Anchor tensile force: 150 kN

- **Tie-rod system 20.0:**
  2.3 : 1 factor of safety against steel failure
- **Tie-rod system 26.5:**
  3.7 : 1 factor of safety against steel failure



The values in the diagram apply for a distance of 350 mm between the top of the concrete and the anchoring point.

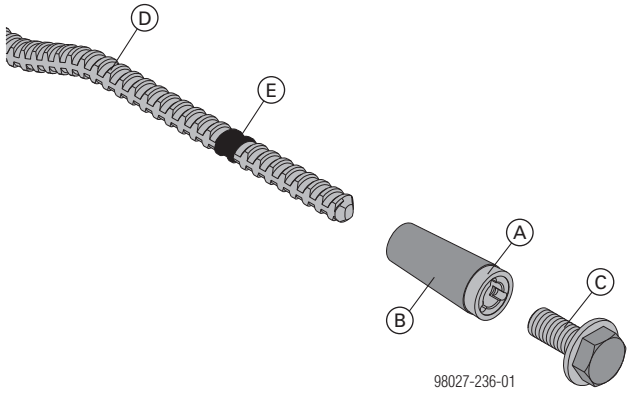
Anchoring on the structure

Positioning point and suspension point

Important note:

ONLY use 'Tie-rod system 20.0' or 'Tie-rod system 26.5'!

Due to the high loads imposed on the suspension points by dam formworks, the 'Tie-rod system 15.0' is not suitable!



A	Universal climbing cone
B	Sealing sleeve K (expendable anchoring component)
C	Cone screw B 7cm
D	Pigtail anchor (expendable anchoring component)
E	Depth mark

- **Universal climbing cone**
  - The positioning point and the suspension point are both prepared using this one single type of cone
- **Pigtail anchor**
  - Expendable anchoring component for anchoring the Universal climbing cone (and thus the climbing unit) in the concrete from one side.
- **Cone screw B 7cm**
  - On the positioning point - for fastening the Universal climbing cone.
  - On the suspension point – as a safe means of suspending the climbing unit.

Ideally, **pigtail anchors** are used, or – depending on the characteristics of the structure – **stop-anchors**.

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:

- the tensile force actually occurring
- length of stop-anchor or pigtail anchor
- 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.

On dam projects using concretes that have been specifically tailored to the project, the required length of the pigtail anchors must be determined in on-site trials. In these trials, the boundary conditions (concrete strength, type of concrete, distance from edge etc.) must be complied with.

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

Preparing the positioning-point

Positioning point with Cone screw B 7cm (with hole drilled through form-ply)

WARNING

- Always screw the pigtail or stop-anchor into the Universal climbing cone until it fully engages (i.e. up to the depth mark). Not screwing the anchor sufficiently far into the cone may subsequently lead to reduced load-bearing capacity and to the failure of the suspension point – resulting in injury and damage.
- For the positioning point and suspension point, ONLY use Cone screws B 7 cm (head of screw is **red**, to indicate its high load-bearing capacity)!

WARNING

Sensitive rod steel!

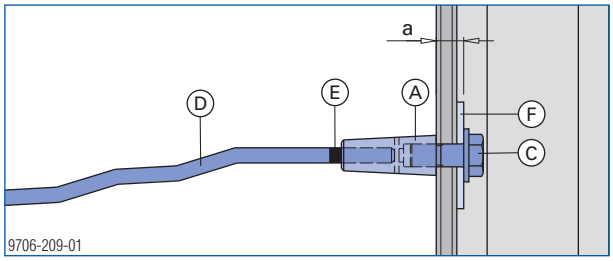
- Never weld or heat tie-rods.
- Tie rods that are damaged or have been weakened by corrosion or wear must be withdrawn from use.
- Only use approved tie-rods.

- The axis of the universal climbing cone must be at right-angles to the surface of the concrete – maximum angle of deviation: 2°.
- Tolerance for locating the positioning points and suspension points: ±5 mm in the horizontal and the vertical.
- Universal climbing cones are supplied with Sealing sleeves K. **Every time** the positioning cones are **re-used**, fit them with **new sealing sleeves** first.

How to mount:

- Fasten a packing plate (e.g. Dokaplex 15 mm) to the form-ply (position as per project plan).
- Drill a diam. 30 mm hole in the form-ply (position as shown in the project plan).
- Push the sealing sleeve all the way onto the Universal climbing cone.
- Push the Cone screw B 7cm through the form-facing, screw it into the Universal climbing cone and tighten it firmly.
- Screw the Pigtail anchor into the Universal climbing cone, until it engages (up to the depth mark).

The pigtail anchor must be facing downwards



a ... 35 - 45 mm

A	Universal climbing cone + Sealing sleeve K
C	Cone screw B 7cm
D	Pigtail anchor (expendable anchoring component)
E	Depth mark
F	Packing plate

Tools needed:

- Reversible ratchet 3/4"
- Spanner for Universal climbing cone 15.0/20.0
- Extension 20cm 3/4"
- Box nut 50 3/4" (for Cone screw B 7cm)

Important note:

The cone-fixing method that involves drilling through the form-ply is the one that is most suitable for the working conditions encountered on dam construction sites.

If the large size of the drilled hole makes it impracticable to use the Cone screw B 7cm for the positioning-point, (e.g. if the suspension points are often not in the same position as in the previous casting section), then the **Positioning clamp M30** must be used (**hole diam. = 9 mm**).

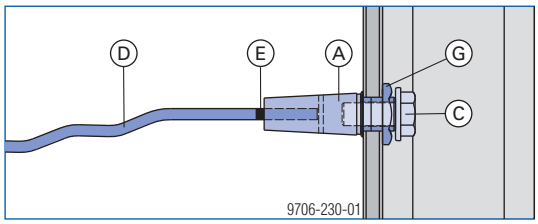
The cone should only be fixed with the **Positioning disc M30** in **exceptional situations**! However, in this case **additional precautions** must be taken to ensure that it is not dislodged from its exact installation location during pouring!

Form-ply protection

The Form-ply protector 32mm protects the form-ply from damage around the positioning-point. This is a particular advantage for formwork with high numbers of repeat uses.

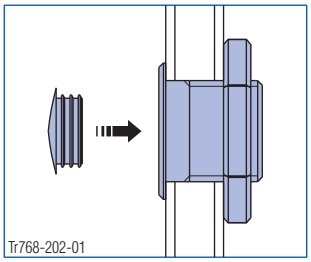
Possible thicknesses of form-ply: 18 - 27 mm

In order to fit the Form-ply protector, a 46 mm diam. hole must be drilled in the form-ply first.



A	Universal climbing cone + Sealing sleeve K
C	Cone screw B 7cm
D	Pigtail anchor (expendable anchoring component)
E	Depth mark
G	Form-ply protector 32mm (width-across 70 mm)

Where necessary, the Form-ply protector 32mm can be closed off with a Cover cap D35x3 (included with product).



Pouring

➤ Before pouring, check all positioning points and suspension points once again.

- The axis of the universal climbing cone must be at right-angles to the surface of the concrete – maximum angle of deviation: 2°.
- Tolerance for locating the positioning points and suspension points: ±5 mm in the horizontal and the vertical.
- The sealing sleeve must be completely pushed onto the Universal climbing cone.
- The depth mark on the pigtail anchor or stop-anchor must be right up against the Universal climbing cone = must be screwed in to the full depth.

Make marks on the top edge of the formwork so that you can easily see where the anchoring points are during pouring.

➤ Do not place concrete directly above the pigtail or stop-anchors.

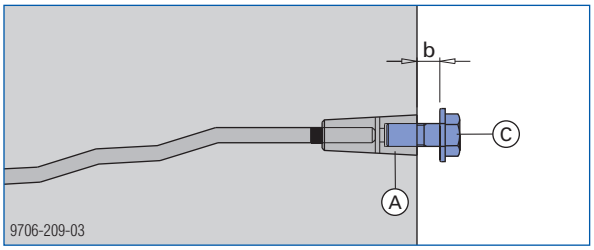
➤ Do not allow the vibrator to touch the pigtail or stop-anchors.

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

Preparing the suspension point

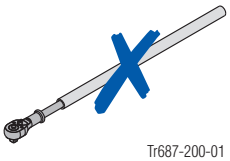
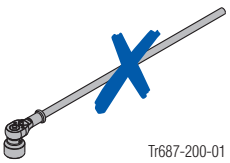
➤ Screw the Cone screw B 7cm into the Universal climbing cone until it engages, and tighten it firmly. A tightening torque of 100 Nm (20 kg, assuming a ratchet-length of approx. 50 cm) is sufficient.

Ensure that control-dimension b = 30 mm!



A Universal climbing cone
C Cone screw B 7cm

The only tool allowed to be used for screwing in and fixing the Cone screw B 7cm in the Universal climbing cone is the Reversible ratchet 3/4".

Reversible ratchet 3/4"	Reversible ratchet 3/4" with extension	Ratchet MF 3/4" SW 50
 Tr687-200-01	 Tr687-200-01	 Tr687-200-01

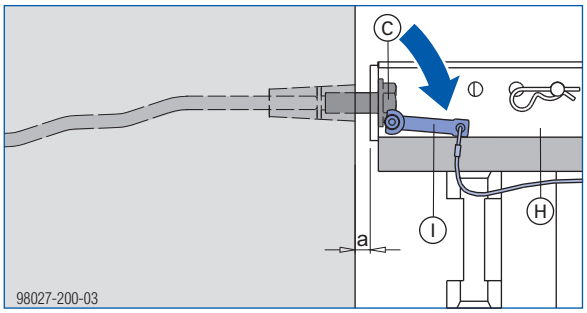
Suspending and securing the cantilever bracket

➤ Suspend the Cantilever bracket from the Cone screw B 7cm of the finished suspension point.

➤ Push the fastening bolt into the Cantilever bracket, at 90° to the platform decking, until it engages.

➤ Tilt the fastening bolt down onto the platform decking.
The cantilever bracket is now secured against accidental lift-out.

The connection bolt must be in the horizontal!



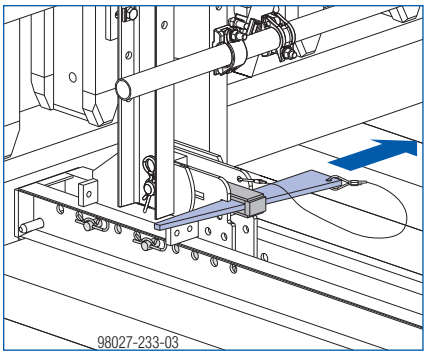
a ... play: approx. 18 mm

C Cone screw B 7cm
H Cantilever bracket D15
I Fastening bolt

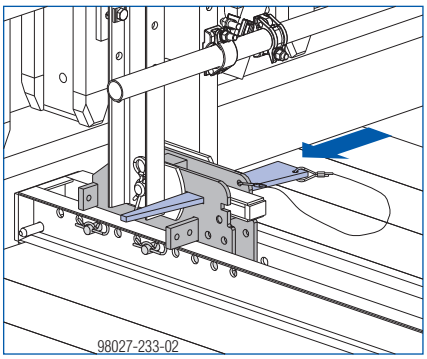
Operating the formwork

Closing the formwork

➤ Remove the wedge from the release position.



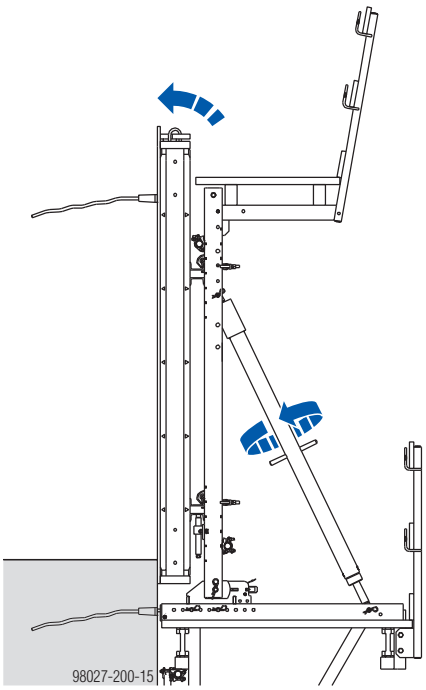
➤ Hammer the wedge into the press-tight position with a gentle blow of the hammer.



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

➤ Plumb and align the formwork element with the Spindle struts.

➤ Fasten positioning anchors to the formwork.



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

➤ After adjusting the formwork elements, hammer the wedges in once again.

Inclining the formwork forward

Important note:

Incline the formwork forward to compensate for deformation during pouring.

The extent of forward inclination (see shop drawing / assembly plan) will depend upon the following factors:

- Block height
- Pressure of fresh concrete
- Influence width of cantilever brackets
- Formwork solution

Possible incorrect usages

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

WARNING

It is not allowed to transfer any extra forces into the formwork!

➤ Do not use hoists or other such devices for positioning and re-adjusting the formwork.

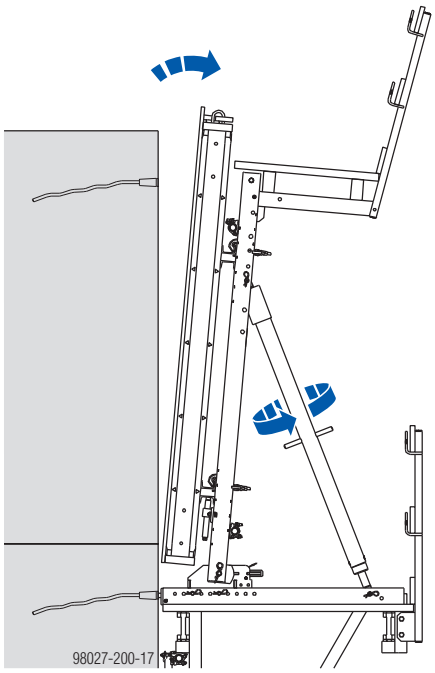
➤ Do not use the formwork to force incorrectly placed reinforcement steel into position.

➤ Press the formwork against the concrete without using any extra tools (e.g. extra screwjack mechanisms).

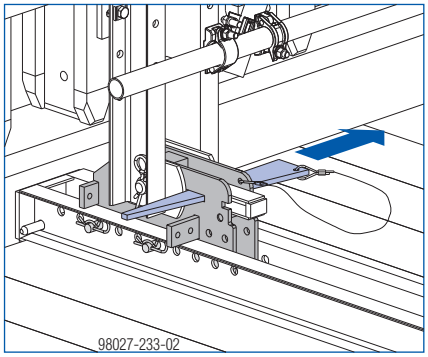
➤ Never use 'brute force' on the adjusting spindles (e.g. with tube-extensions).

Opening the formwork

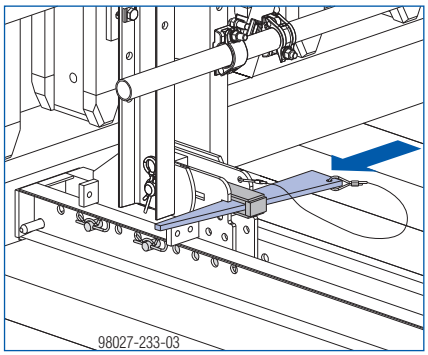
- Remove the Cone screw B 7cm from the positioning-point.
- Remove the connectors from the adjacent gang-forms.
- Detach the formwork element from the concrete by turning the Spindle struts, and tilt it back.



- Remove the wedge from the press-tight position.



- Hammer in the wedge in the release position.



- Screw a Cone screw B 7cm into the Universal climbing cone. The next suspension point is now ready for use.
- Remove the Universal climbing cone (working from the suspended platform).

Plumbing & aligning the formwork

Adjusting the formwork

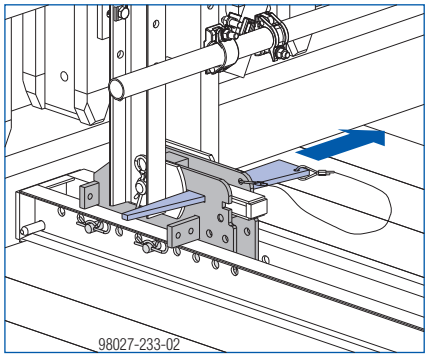
In order to permit exact adjustment of the formwork elements in relation to one another and to the structure, they are adjustable in both the vertical and the horizontal.

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)

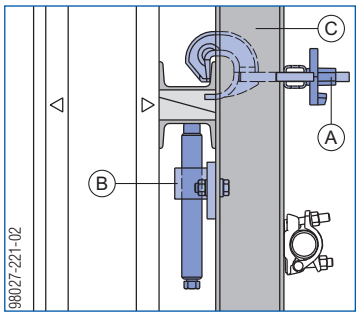
Preparing the adjusting operation

➤ Remove the wedge from the press-tight position.



➤ Loosen the **Waling-to-bracket holders** with a blow of the hammer.

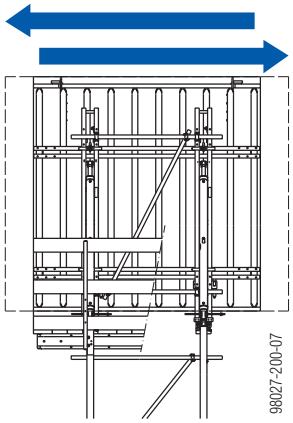
The **Adjusting spindles** permit a vertical adjustment range of approx. 150 mm. Also, the Adjusting spindles can be relocated in the hole-grid of the Vertical waling.



A	Waling-to-bracket holder
B	Adjusting spindle
C	Vertical waling D15

Length adjustment

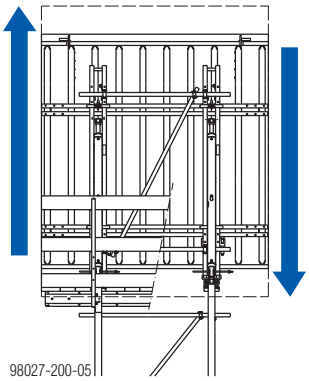
➤ Push the formwork to either side.



Height and angle adjustment

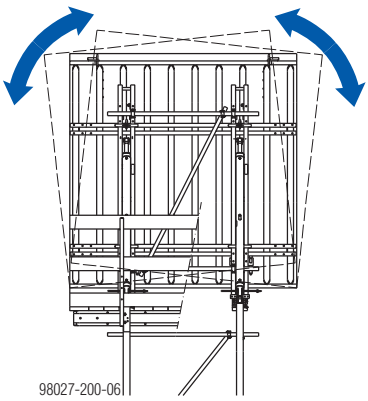
Height adjustment

➤ Turn both adjusting spindles.



Side angle adjustment

➤ Only turn one adjusting spindle.

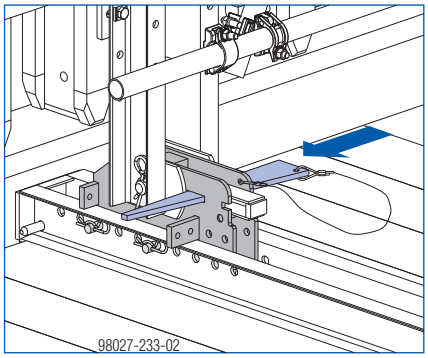


Ending the adjusting operation

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

Press the formwork to the concrete

➤ After adjusting the formwork elements, hammer the wedges into the press-tight position.



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

Repositioning

Lifting by crane

Instructions for safe resetting of the entire unit

Important note:

- **Before lifting:** 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.
- Angle of inclination 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!
- If lifting past sloping walls, fasten an overhanging lifting device to the vertical waling.

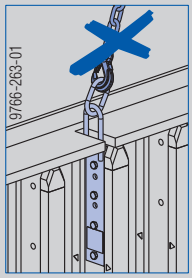
  Where the formwork is inclined forward, check whether a tension guy-bracing chain is needed.

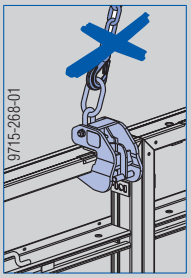
Length of chain = at least the space between the slinging points

This automatically leads to the required angle of inclinationβ.

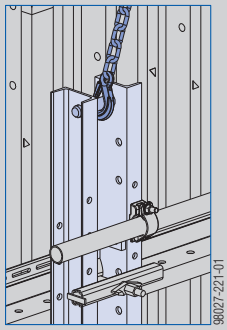
WARNING

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

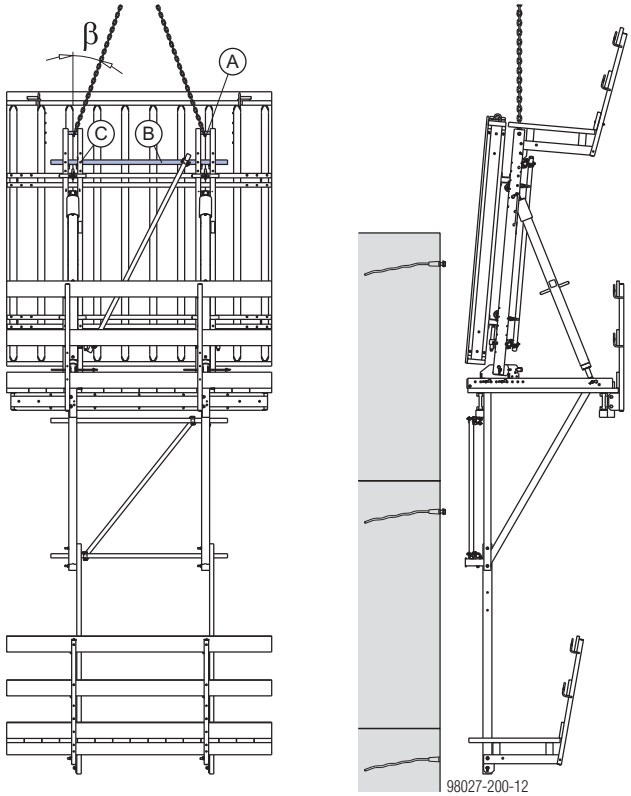




➤ Attach the lifting chain to the suspension bolts of the Vertical waling.



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



β ... max. 30°

A	Suspension bolt
B	Bracing against oblique pull (e.g. scaffolding tube)
C	Screw-on couplers

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 4000 kg	2

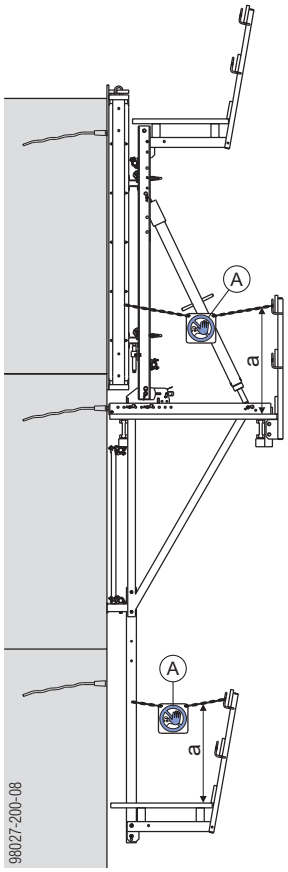
Important note:

If the unit to be lifted has a total weight of **over 4000 kg**, the **Lifting beam 110kN 6.00m** must be used.

Important note:

- When one climbing unit is lifted and repositioned, this opens up exposed fall-hazard locations on the remaining units. 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.

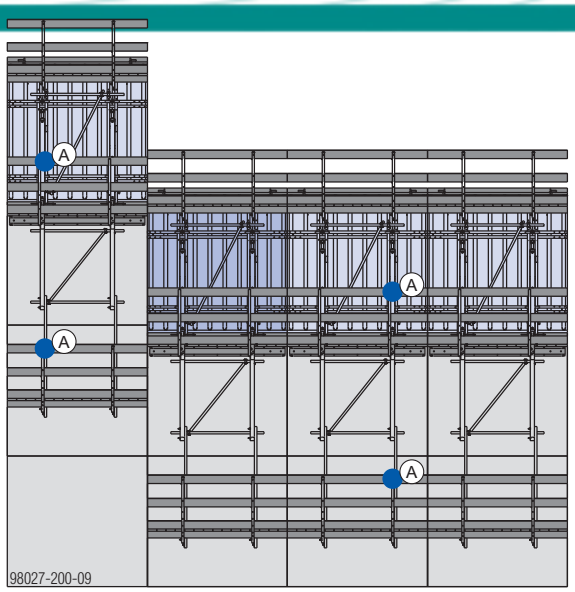
- The personnel in charge of the repositioning operation are responsible for positioning the access prohibition barriers correctly.
- During the lifting/repositioning cycle, no site personnel are allowed to be on the units to be climbed, or on adjacent units for repositioning.
- During the repositioning operation, the persons operating the climbing formwork must use personal protective equipment to guard against falls (e.g. Doka personal fall-arrest set).



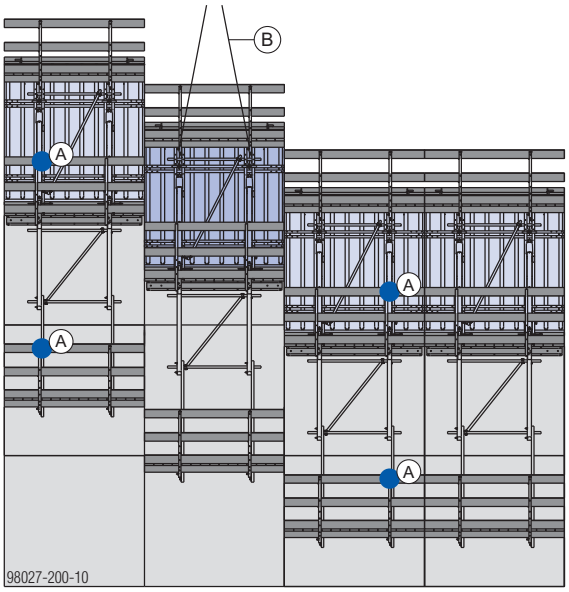
a ... 1.00 - 1.20 m

A "No entry" prohibition sign 300x300mm

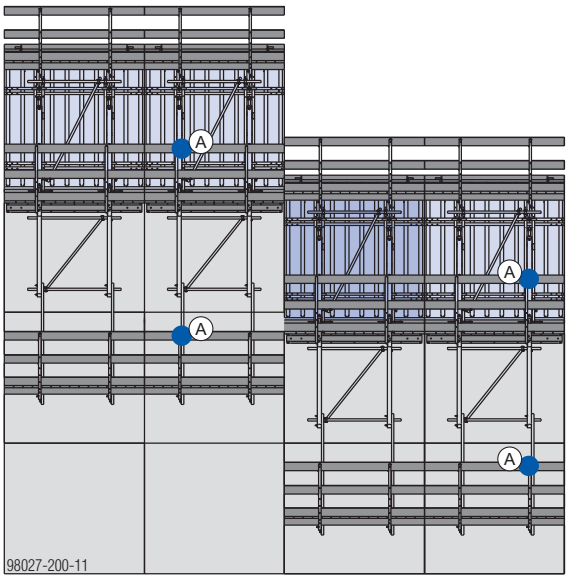
Initial situation



Hoist the unit for repositioning up to the next section.



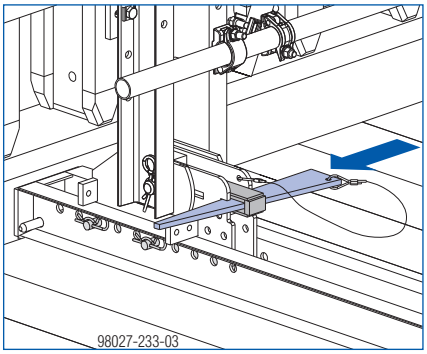
Horizontal repositioning of the barriers



A Warning sign "No entry" 300x300mm
B Crane suspension tackle

Repositioning the entire unit

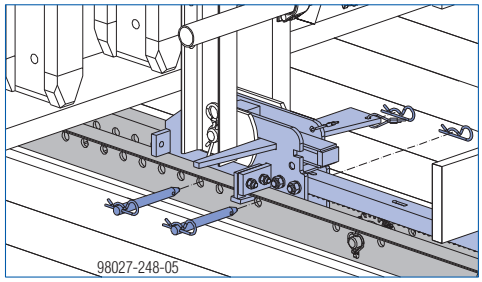
➤ Hammer in the wedge in the release position.



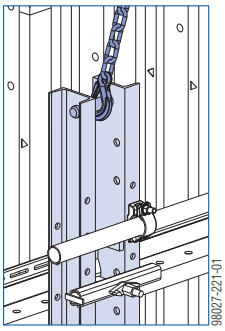
On retractable formwork:

➤ Check the Swivel bearing plate D15 before every repositioning operation.

- Pinned connections must be firmly pinned in place and secured.
- Wedges must be firmly hammered into the release position.

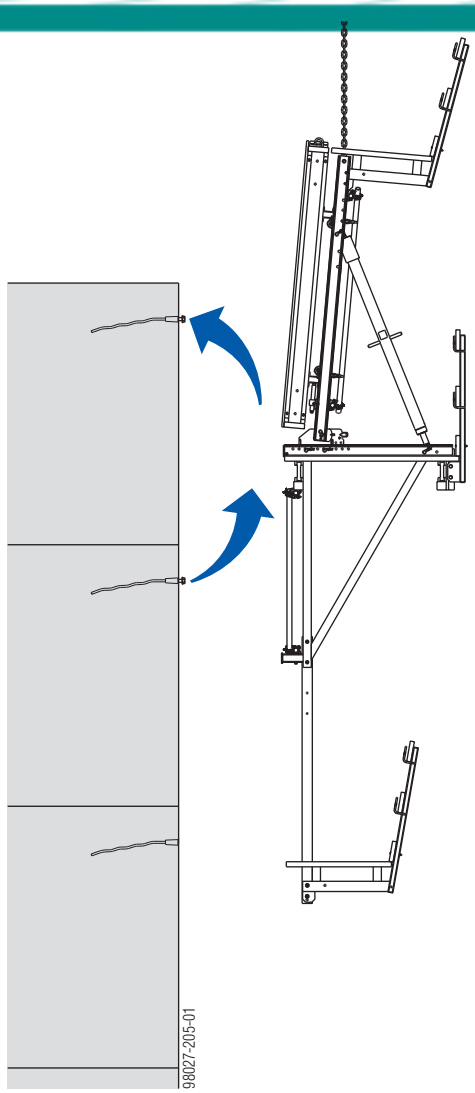


➤ Attach the lifting chain to the suspension bolts of the Vertical waling.



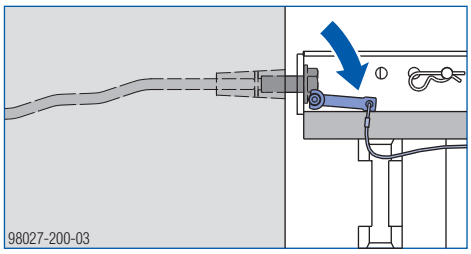
➤ Remove the fastening bolts (= lift-out guard) from the suspension points.

➤ Reposition the entire unit by crane.



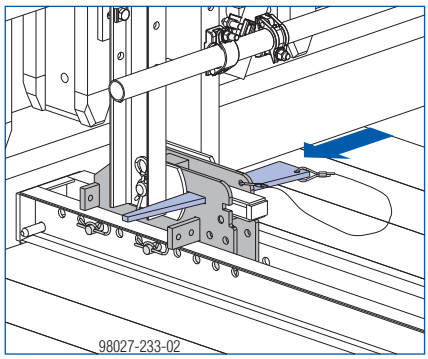
➤ Use connection bolts to secure the cantilever bracket against accidental lift-out.

The connection bolt must be in the horizontal!



➤ Detach the lifting chain from the climbing unit.

➤ After lifting, hammer the wedges into the press-tight position.

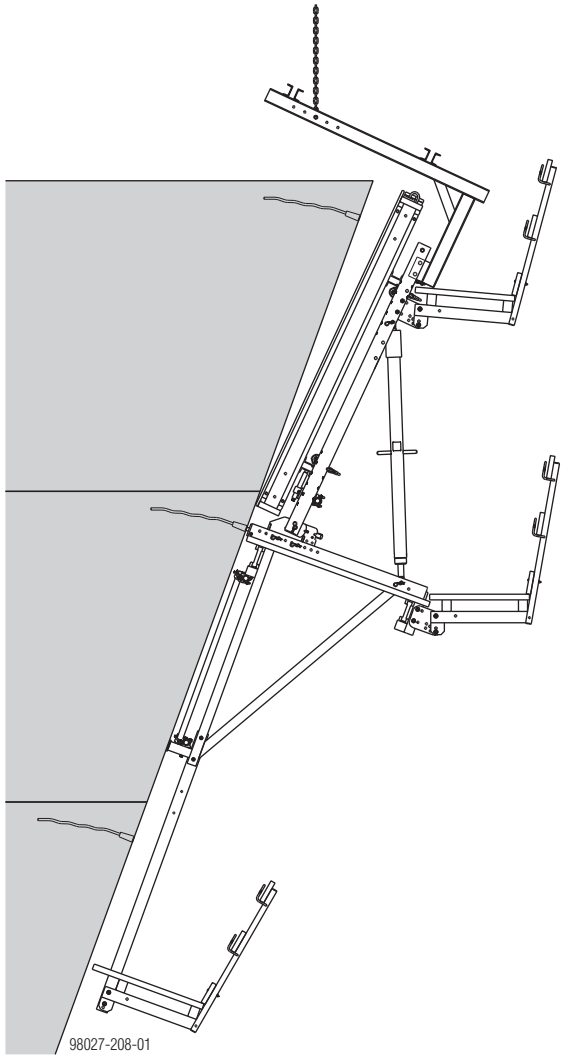


This presses the formwork element up against the previously cast section.

Lifting past overhanging surfaces

The (project-specific) overhanging lifting device makes it possible to lift and reposition dam formwork safely where overhanging concrete surfaces are being formed.

Variable hoisting points on the overhanging lifting device enable the entire unit to be held at the required angle during lifting.



Follow the directions in the 'Overhanging lifting device' Operating Instructions.

Operating the climbing formwork

Starting up

The modular design of the Dam formwork system means that many different combinations are possible.
Depending on the project, the actual design may thus differ very greatly from the basic type described here.

➤ In these cases, you should discuss the assembly procedure with your Doka technician.

➤ Follow the shop drawing / assembly plan.

Important note:

- A hard, flat, firm surface is needed!
- Prepare a sufficiently large assembly area.
- Tightening torque of the couplers for the bracing tubes: 50 Nm

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 "Anchoring on the structure").
- Closing the formwork (see 'Closing the formwork').
- Striking (see 'Opening the formwork').
- In addition, the following sections must also be observed:
  - Plumbing & aligning the formwork
  - Resetting 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 closed!

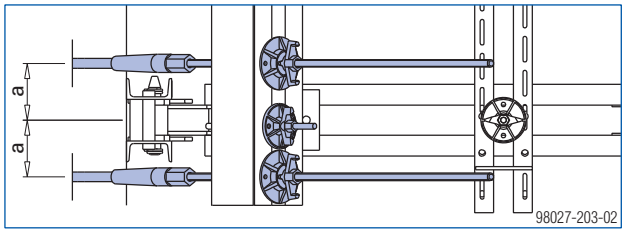
1st casting section

Anchoring in the base slab

Important note:

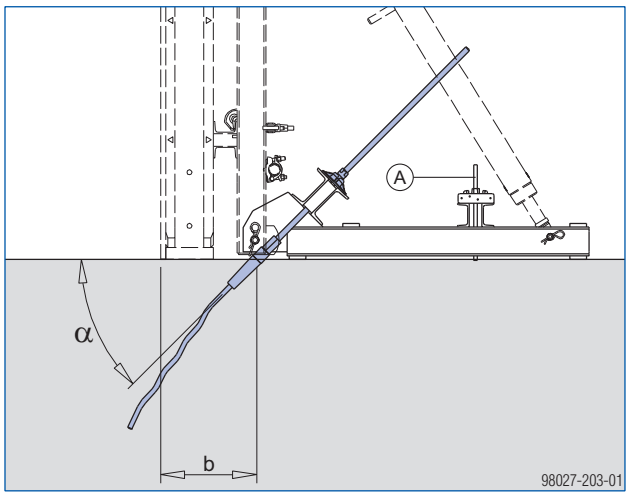
The anchoring arrangements for the Starter-block formwork are always dimensioned on a project-specific basis.

For each Starter-block unit, two diagonal anchors are each placed **150 mm** either side of the vertical axis of the Starter-block unit.



a ... 150 mm

Exception: If one diagonal anchor per Starter-block unit would have sufficient load-bearing capacity, then these diagonal anchors must be placed symmetrically with respect to each unit.



A Tension-rod brace

Formwork system	Dimension 'b'	Anchor inclination α
e.g. Large-area formwork Top50	40.7 cm	45°
e.g. Framed formwork Framax	30.6 cm	

Note:

The tension-rod brace makes it easier to adjust and align the formwork.

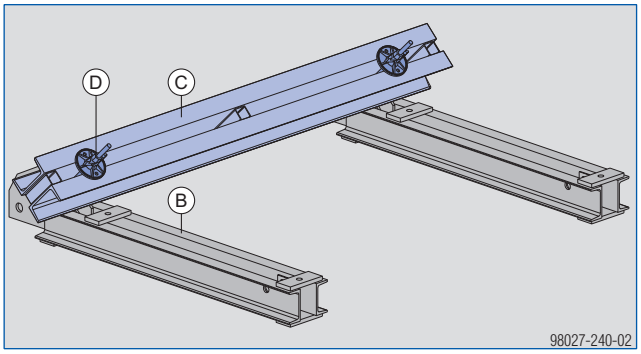
A project-specific check must be made to determine whether the tension-rod brace is also required for structural design reasons.

For more information on anchoring in the base slab, see the User Information booklet "Doka supporting construction frames".

In most cases, the starter-block formwork will have the same influence width as the brackets. Where the influence width is the same, the anchor tensile force for the Starter-block unit will always be lower than that for the bracket.

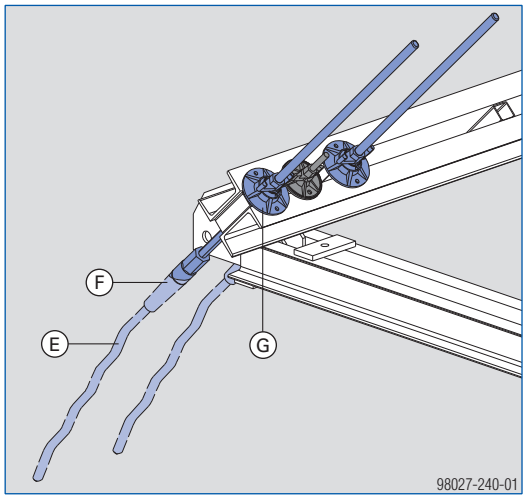
Assembling the starter-block formwork

- Lay down the Starter-block units, spaced apart by the exact centre-to-centre distance.
- Fix an Anchor waling to the Starter-block units with tie-rods and super-plates.



B Starter-block unit D15
C Anchor waling 1.95m or 2.95m
D Tie-rod 15.0mm + Super-plate 15.0

- Use she-bolts and super-plates to anchor the Anchor waling to the base slab.



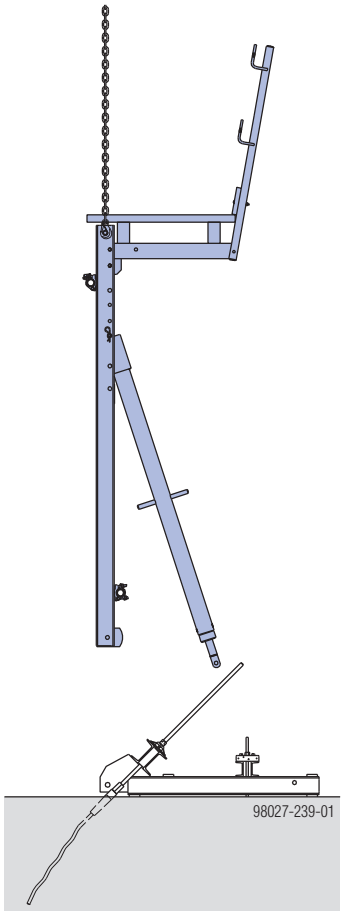
E Pigtail anchor
F She-bolt
G Super-plate

Instead of the starter-block unit it is also possible to use Doka supporting construction frames

Vertical-waling unit:

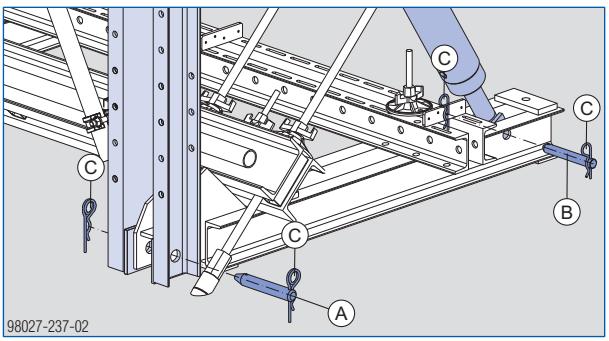
➤ Attach the lifting chain to the suspension bolts of the Vertical waling.

➤ Crane-lift the vertical-waling unit to the Starter-block unit.



➤ Pin the Vertical waling to the Starter-block unit with a Swivel bolt 208 and secure this with 2 spring cotters.

➤ Pin the Spindle strut to the Starter-block unit with a Swivel bolt 185 and secure this with 2 spring cotters.



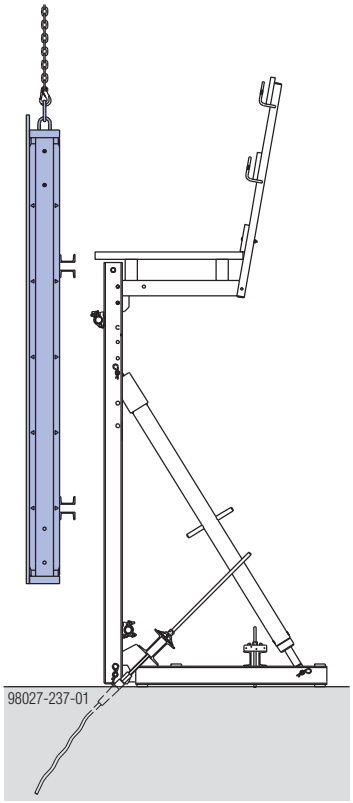
A Swivel bolt 208
B Swivel bolt 185
C Spring cotter

➤ Insert guard-rail boards and use nails to secure them to the handrail post plates.

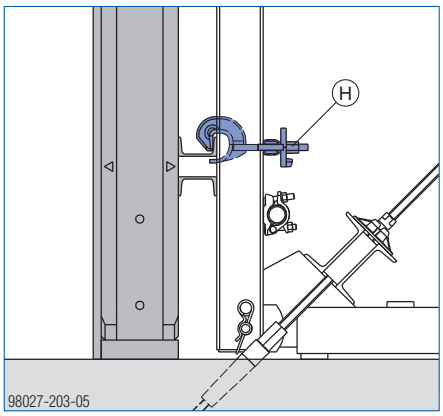
Formwork:

➤ Attach the lifting chain to the lifting-brackets on the pre-assembled formwork.

➤ Crane-lift the formwork to the vertical-waling unit.



➤ Fix the formwork to the Vertical walings with Waling-to-bracket holders.



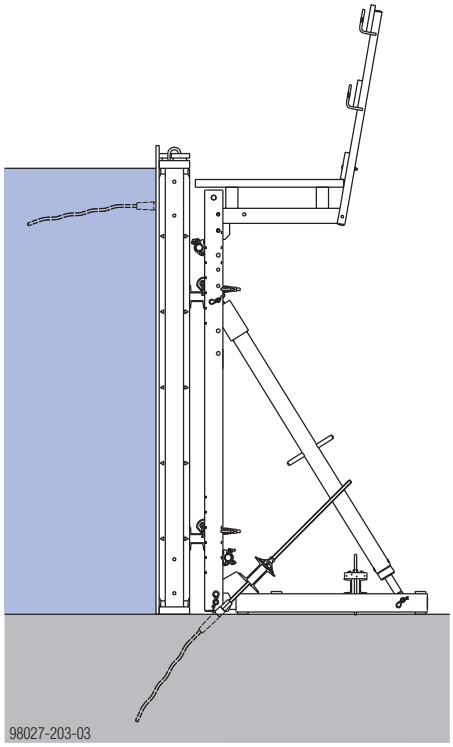
H Waling-to-bracket holder 9-15cm

If the Multipurpose waling collides with the Adjusting spindle:

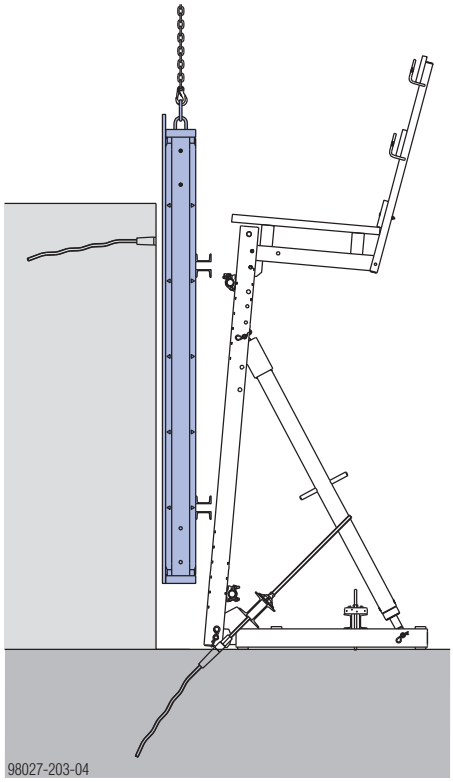
➤ Dismount the Adjusting spindle.
The Adjusting spindle is not needed until the formwork is deployed on the Cantilever bracket.

Closing / pouring / opening

- Plumb and align the formwork element with the Spindle struts.
- Fasten positioning anchors to the formwork.
- Apply concrete release-agent.
- Pour the 1st section.



- Striking (see the section headed 'Opening the formwork').
- Remove the Waling-to-bracket holders.
- Attach the lifting chain to the lifting brackets on the formwork gang.
- Lift the formwork element off the vertical-waling unit.

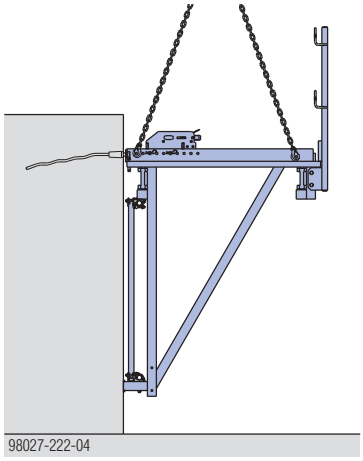


- Clean the formwork.
- Set the gang-form down on a flat surface, with the form-ply facing downwards.
- Attach the lifting chain to the suspension bolts of the Vertical waling.
- Undo the pinned connections between the vertical-waling unit and the Starter-block unit.
- Lift the vertical-waling unit out of the way and dismount the Starter-block unit.

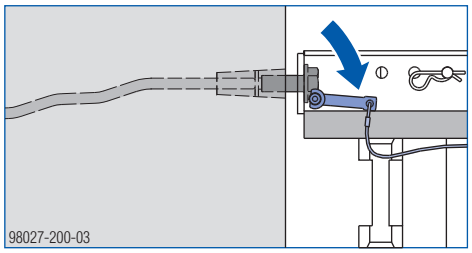
2nd casting section

Hanging the working platform into place on the suspension points

- Prepare the suspension points.
- Using a four-part lifting chain (e.g. Doka 4-part chain 3.20m), raise the prepared working platform and lower it into the suspension points.
- Secure the working platform with fastening bolts.



Do a sight-check to make sure that the fastening bolts are in the horizontal!



- Insert guard-rail boards and use nails to secure them to the handrail post plates
  or attach scaffolding tubes 48.3mm using Screw-on couplers 48mm 95.

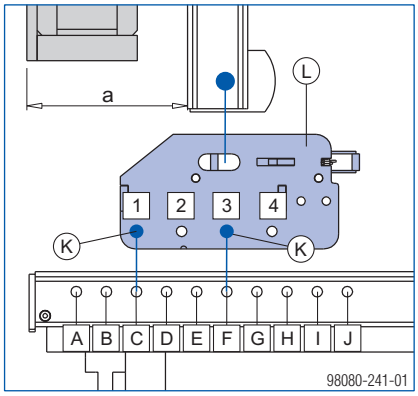
Positioning the Swivel bearing plate

The pinning position for the Swivel bearing plate depends on the constructional height of the formwork.

Swivel bearing plate D15

a ... Overall height of formwork [mm]		Pinning position	
min.	max.	1st pin	2nd pin
172	222	1 - A	3 - D
202	252	2 - C	4 - F
232	282	1 - B	3 - E
262	312	2 - D	4 - G
292	342	1 - C	3 - F
322	372	2 - E	4 - H
352	402	1 - D	3 - G
382	432	2 - F	4 - I
412	462	1 - E	3 - H
442	492	2 - G	4 - J
472	522	1 - F	3 - I
532	582	1 - G	3 - J

- Pin the Swivel bearing plate D15 into the Cantilever bracket with both Swivel bolts d20 and secure these with 2 Spring cotters 5mm.



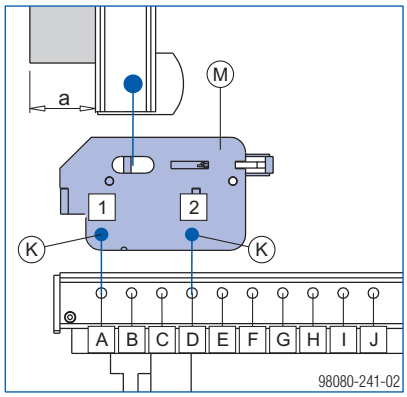
K Swivel bolt d20
L Swivel bearing plate D15

Example:
Overall height of formwork a = 321 mm
(Large-area formwork Top50)
Result:
- 1st pin: 1 - C
- 2nd pin: 3 - F

Swivel bearing plate D15 S

a ... Overall height of formwork [mm]		Pinning position	
min.	max.	1st pin	2nd pin
75	125	1 - A	2 - D

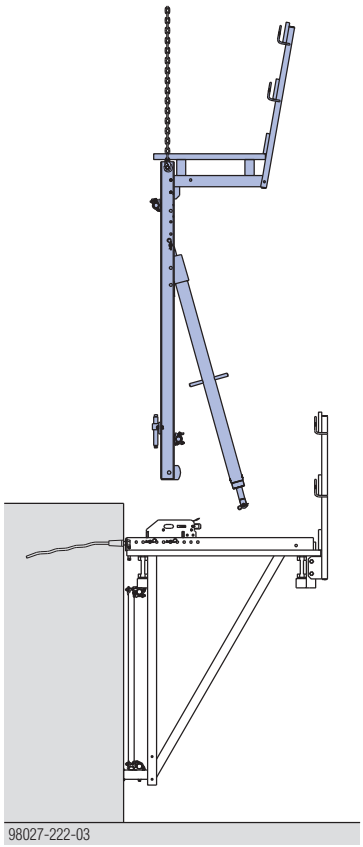
➤ Pin the Swivel bearing plate D15 S into the Cantilever bracket with both Swivel bolts d20 and secure these with 2 Spring cotters 5mm.



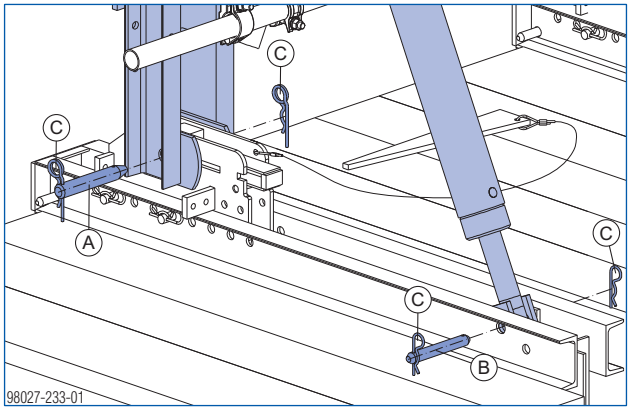
K Swivel bolt d20
M Swivel bearing plate D15 S

Mounting the vertical-waling unit to the working platform

➤ Bolt the Adjusting spindle onto the Vertical waling (position: see shop drawing / assembly plan).
➤ Set the length of the Spindle struts as shown in the shop drawing / assembly plan.
Make sure that the Plumbing spindles are extended the same distance at either end of each spindle.
➤ Attach the lifting chain to the suspension bolts of the Vertical waling.
➤ Crane-lift the vertical-waling unit to the working platform.

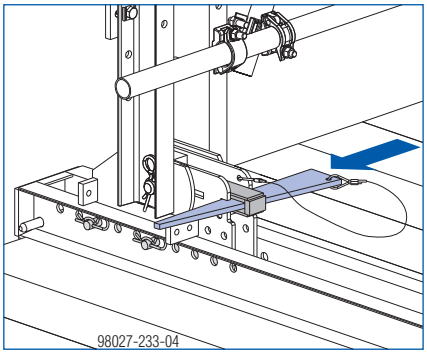


➤ Remove the wedge from the Swivel bearing plate.
➤ Pin the Vertical waling to the Swivel bearing plate with a Swivel bolt 208 and secure this with 2 spring cotters.
➤ Pin the Spindle strut to the Cantilever bracket with a Swivel bolt 185 and secure this with 2 spring cotters.



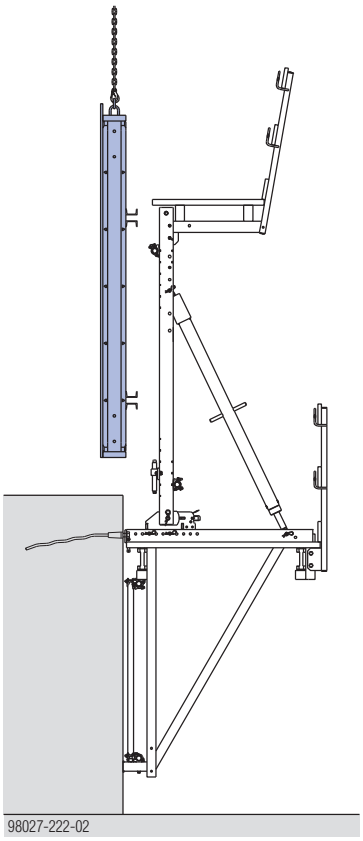
A Swivel bolt 208
B Swivel bolt 185
C Spring cotter

➤ Hammer in the wedge in the release position.

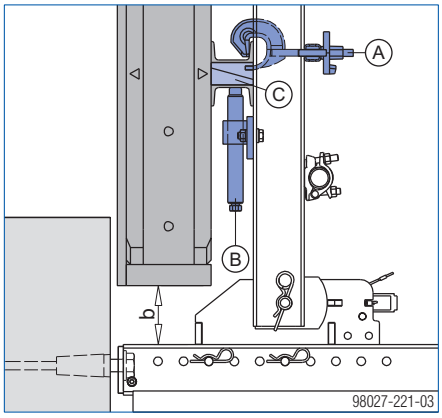


Mounting the formwork to the vertical-waling unit

➤ Attach the lifting chain to the lifting-brackets on the pre-assembled formwork.
➤ Crane-lift the formwork to the vertical-waling unit.



➤ Fix the formwork to the Vertical walings with Waling-to-bracket holders.
➤ Fix timber wedges in the multipurpose 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 "Plumbing & aligning the formwork").

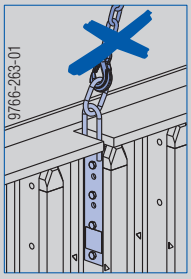


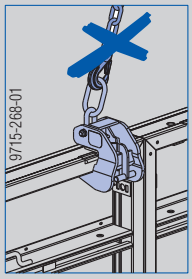
A Waling-to-bracket holder 9-15cm
B Adjusting spindles
C Timber wedges

Making it impossible to use any of the forbidden attachment methods when lifting and repositioning the unit in one piece:

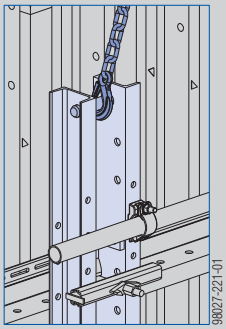
WARNING

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

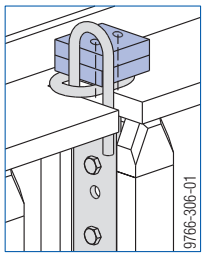




- Attach the lifting chain to the suspension bolts of the Vertical waling.

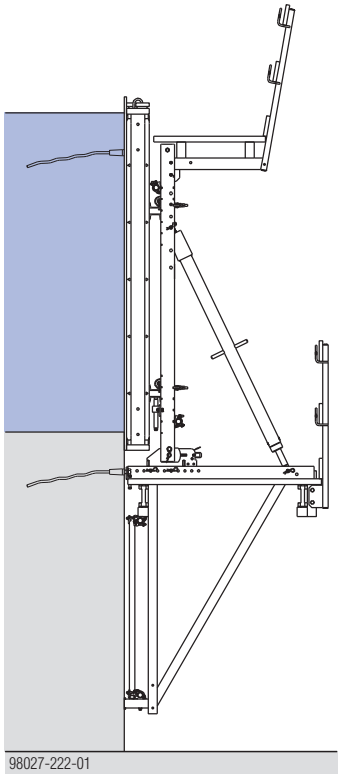


- nail e.g. a board on in such a way that the crane suspension tackle cannot be hung into place in the lifting-bracket.



Closing / pouring / opening

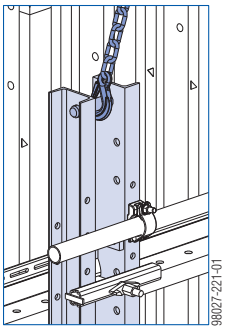
- Apply concrete release-agent.
- Close the formwork (see the section headed 'Closing the formwork').
- Pour the 2nd section.



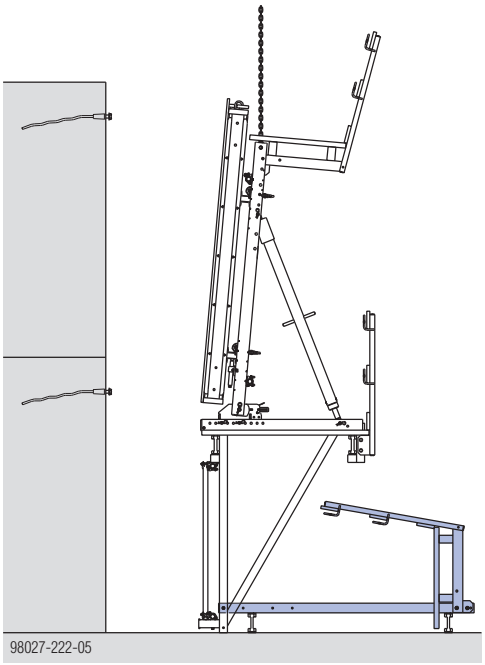
- Striking (see the section headed 'Opening the formwork').
- Clean the formwork.

3rd casting section

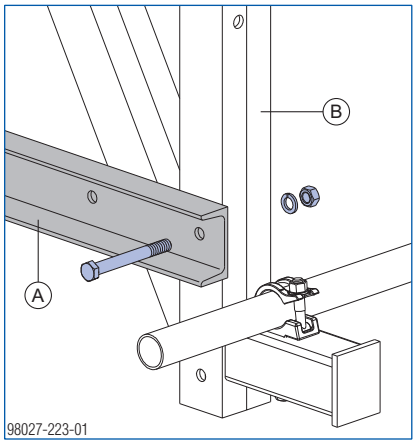
- Prepare the suspension points.
- Attach the lifting chain to the suspension bolts of the Vertical waling.



- Remove the fastening bolts (= lift-out guard) from the suspension points.
- Crane-lift the entire unit to the pre-assembled suspended platform.



- Bolt the Suspension profile D15/D22 of the pre-assembled suspended platform to the Cantilever bracket with the first M16 hexagon bolt.

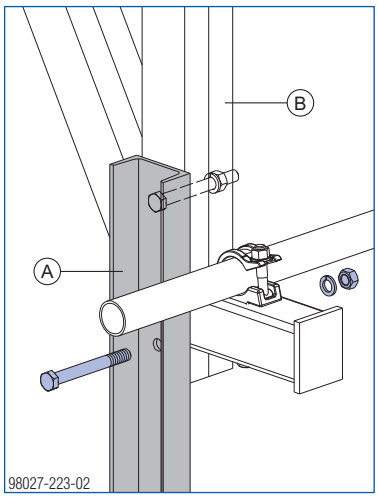


A Suspension profile D15/D22
B Cantilever bracket D15

Each Suspension profile D15/D22 is supplied complete with:

- 2 hexagon bolts M16x140
- 2 spring washers A16
- 2 hexagon nuts M 16

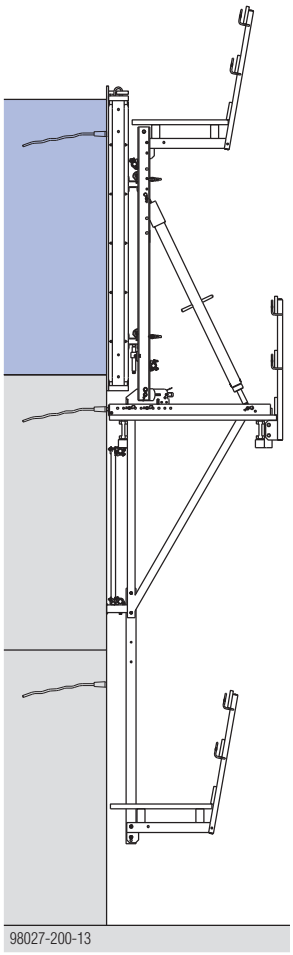
- Lift the entire unit by crane and hang it into place in the suspension point.
- Secure the working platform with fastening bolts.
- Bolt the Suspension profile D15/D22 of the pre-assembled suspended platform to the Cantilever bracket with the second M16 hexagon bolt.



A Suspension profile D15/D22
B Cantilever bracket D15

Closing / pouring / opening

- ➤ Apply concrete release-agent.
- ➤ Close the formwork (see the section headed 'Closing the formwork').
- ➤ Pour the 3rd section.



- ➤ Striking (see the section headed 'Opening the formwork').
- ➤ Clean the formwork.

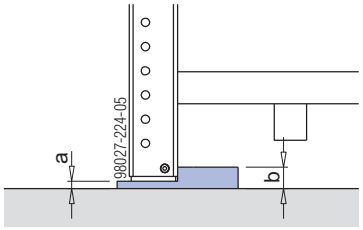
Assembly instructions

Assembling the working platform

➤ Follow the shop drawing / assembly plan.

Fitting the bracing

➤ Prepare an assembly bench.



a ... 18 mm
b ... 53 mm

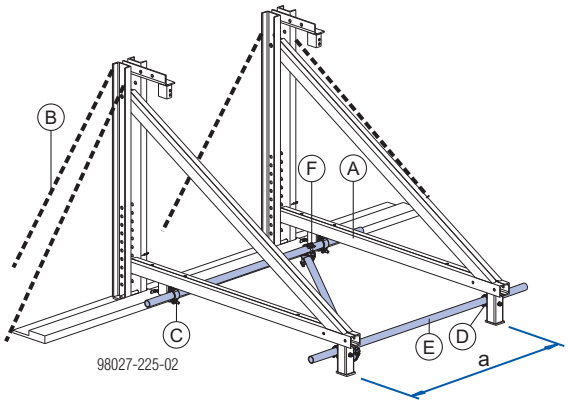
➤ Prepare the bracing.

➤ Stand the Cantilever brackets the predetermined centre-to-centre distance apart (see shop drawing / assembly plan).

➤ Secure the Cantilever brackets so that they cannot topple over.

➤ Brace the Cantilever brackets in the horizontal, with 4 screw-on couplers and 2 scaffolding tubes.

➤ Mount a scaffolding tube as a diagonal stiffening reinforcement between the brackets, using 2 swivel couplers.
Distance between screw-on coupler and swivel coupler: max. 160 mm.



a ... centre-to-centre distance

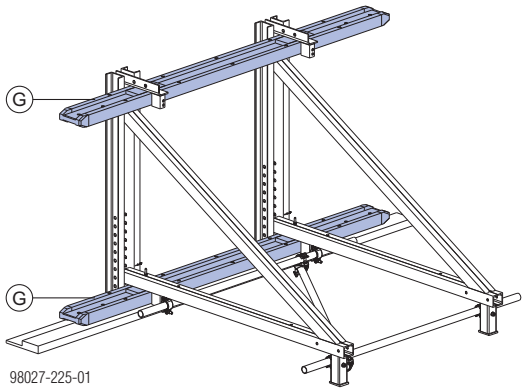
A	Cantilever bracket D15
B	Bracing
C	Screw-on coupler 48mm 50
D	Screw-on coupler 48mm 95
E	Scaffold tube 48.3mm
F	Swivel coupler 48mm

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

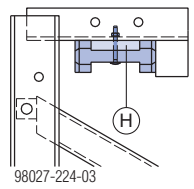
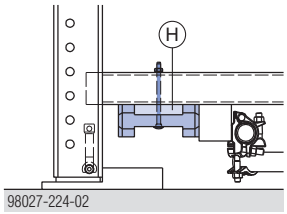
Mounting the decking supports

The choice of platform beam will depend on the project.
The following configuration is shown with Doka beams H20.

➤ Bolt the Doka beams H20 to the Cantilever brackets.



G Doka beam H20

Fixing method at top	Fixing method at bottom
	

Bolting-items needed for each Cantilever bracket:
- 1 square bolt M10x90
- 1 square bolt M10x160
- 2 washers A 10.5
- 2 hexagon nuts M 10

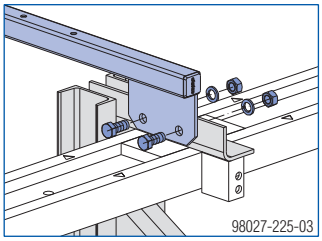
Dimensions

Type of beam	Wooden spacer [mm] **(H)**
H20 P	30 x 118
H20 N	26 x 118

Length of wooden spacers approx. 50 cm.

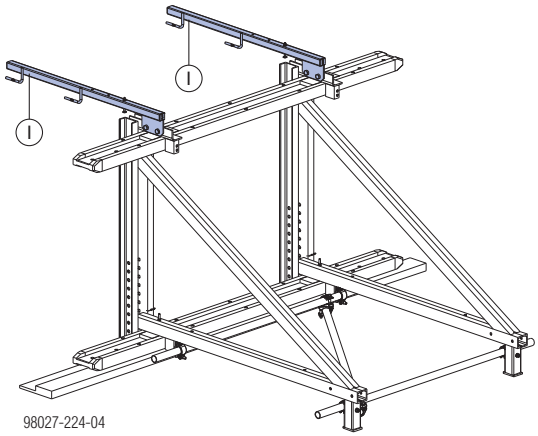
Mounting the railing

➤ Bolt a handrail-post upright to the horizontal profile of the Cantilever bracket.



Each Cantilever bracket is supplied complete with:

- 2 hexagon bolts M20x45
- 2 spring washers A20
- 2 hexagon nuts M20



I Handrail-post upright

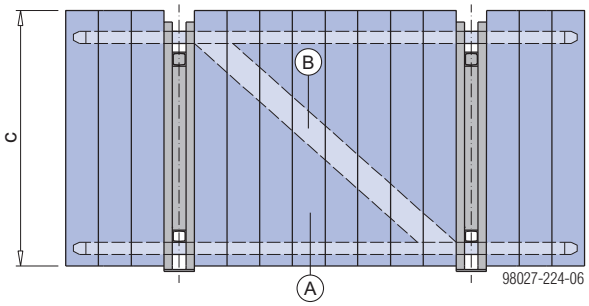
Attaching the platform decking

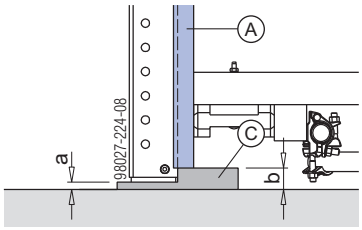
➤ Lay deck-boards **flush** to either side of the horizontal profiles.

➤ Fasten deck-boards to the Doka beams with universal countersunk screws 6x90.

Every deck-board must be fixed with 4 screws!
Do a sight-check to make sure that the deck-boards have been fixed properly!

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

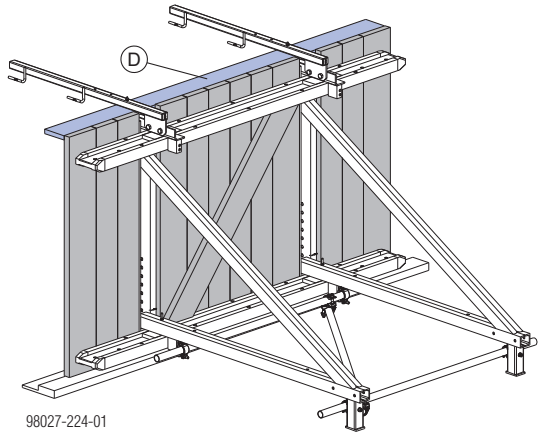




a ... 18 mm
b ... 53 mm
c ... 1690 mm

A Deck-board (e.g. 5x20 cm board)
B Board for spreading loads (e.g. 5x20 cm board)
C Assembly floor

➤ Attach a toeboard (min. 15x3 cm) to the Handrail-post upright with a square bolt M10.



D Toeboard min. 15x3 cm

Bolting-items needed for each handrail-post upright:

- 1 square bolt M10x120
- 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.

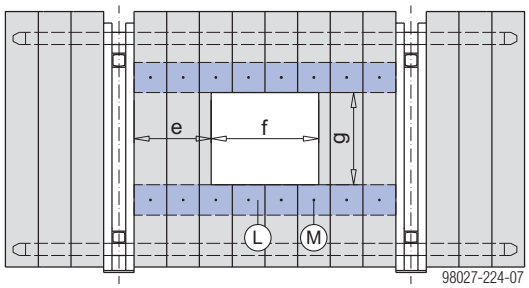
Fitting a manhole

➤ 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.

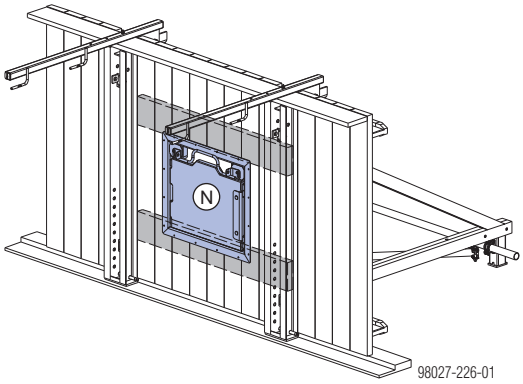


e ... minimum overlap: 2 whole deck-boards
f ... 710 mm
g ... 610 mm

L e.g. deck-board, 5x20 cm

M Square bolt M10 + washer R11 + hexagon nut M10

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



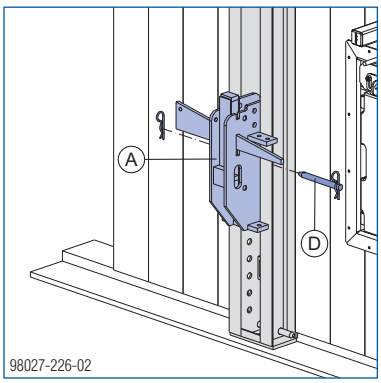
N Manhole B 70/60cm

Attaching the Swivel bearing plate

Choose the appropriate Swivel bearing plate for the formwork system being used:

- Swivel bearing plate D15
  - for timber-beam formwork systems (e.g. Large-area formwork Top 50)
  - for framed formwork systems (e.g. Framed formwork Framax Xlife with a multipurpose waling placed in front)
- Swivel bearing plate D15 S
  - for steel formwork systems
  - for framed formwork systems (e.g. Framed formwork Framax Xlife with no multipurpose waling placed in front)

➤ Pin the Swivel bearing plate onto the Cantilever bracket with a Swivel bolt d20 and secure this with 2 spring cotters.



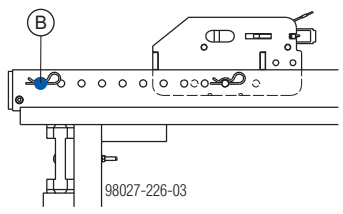
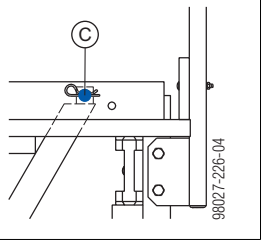
A Swivel bearing plate D15

D Swivel bolt d20

Preparing the crane hoisting points

➤ Pin the 2nd Swivel bolt d20 **(B)** of the Swivel bearing plate in the first pin-hole of the Cantilever bracket and secure it with 2 spring cotters.

➤ Pin the Swivel bolt 185 **(C)** of the Spindle strut D15 into the Cantilever bracket and secure it with 2 spring cotters.

Front crane hoisting point	Rear crane hoisting point
	

Mounting the pouring platform

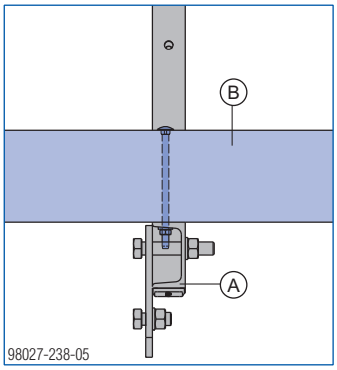
For details of how to assemble and operate the pouring platforms for the formwork system that is being used, see the 'Large-area formwork Top 50' or 'Framed formwork Framax Xlife' User Information booklets.

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.

➤ Follow the shop drawing / assembly plan.

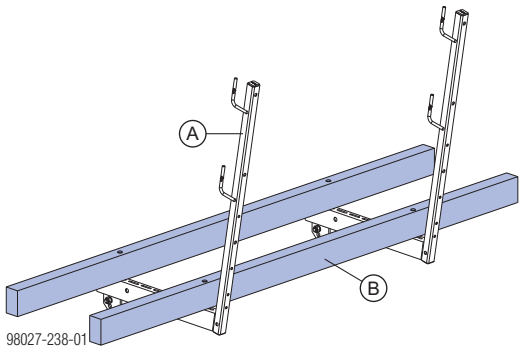
Mounting the decking supports

➤ Bolt squared timbers to the Screw-on access bracket MF75.



Bolting-items needed for each Screw-on access bracket:

- 2 square bolts M10
  (length will depend on the cross-section of the squared timbers)
- 2 washers 10
- 2 hexagon nuts M 10



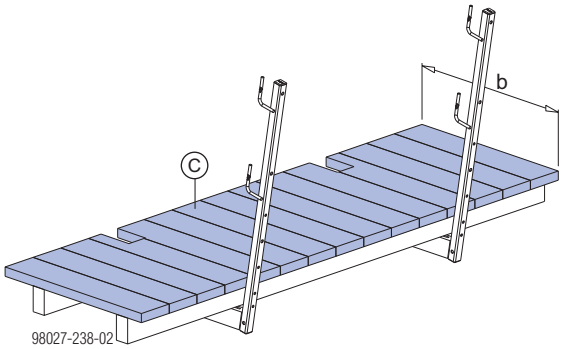
A Screw-on access bracket MF75
B Squared timber

The choice of platform beam will depend on the project.

Mounting the deck-boards

➤ Fasten deck-boards to the Doka beams with universal countersunk screws 6x90.

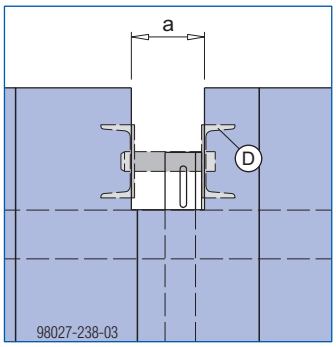
Every deck-board must be fixed with 4 screws!
Do a sight-check to make sure that the deck-boards have been fixed properly!



b ... 950 mm (for straight walls)

C e.g. plank, 5x20 cm

Cut-out needed in platform decking (for access to the crane-hoisting point on the Vertical waling):

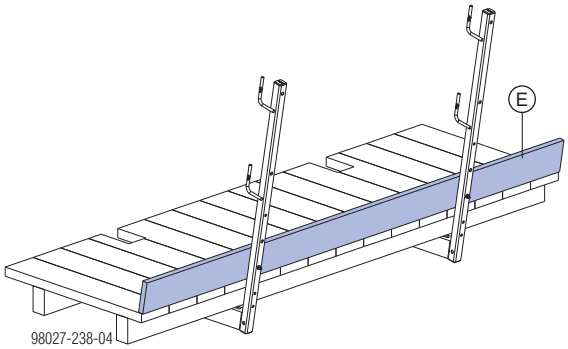


a ... 100 mm

D Vertical waling D15

Mounting toe-board planks

➤ Attach a toeboard (min. 15x3 cm) to the Handrail-post upright with a square bolt M10.



E Toeboard min. 15x3 cm

Bolting-items needed for each handrail-post upright:

- 1 square bolt M10x120
- 1 washer A10
- 1 hexagon nut M10

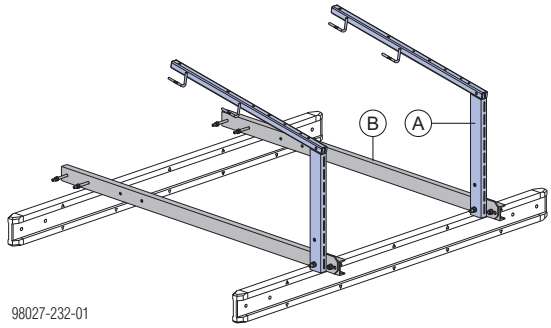
Mounting the suspended platform

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.

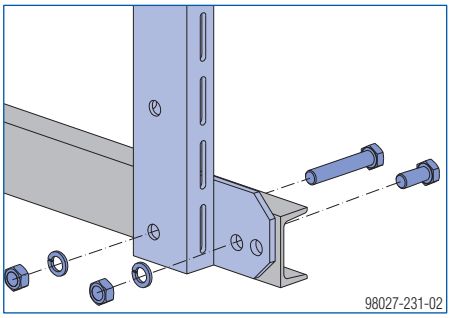
➤ Follow the shop drawing / assembly plan.

Mounting the Screw-on access bracket MF75

➤ Bolt the Screw-on access bracket MF75 to the Suspension profile D15/D22.



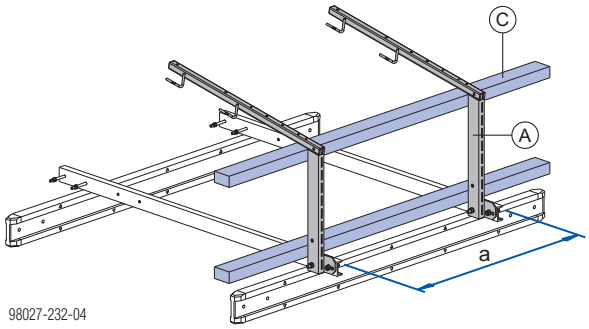
A Screw-on access bracket MF75
B Suspension profile D15/22



Each Screw-on access bracket MF75 is supplied complete with:
- 1 hexagon bolt M20x110
- 1 hexagon bolt M20x45
- 2 spring washers A20
- 2 hexagon nuts M20

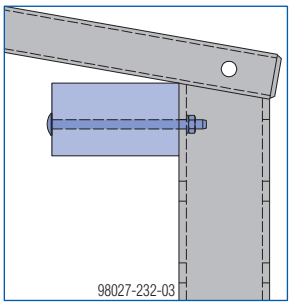
Mounting the decking supports

➤ Bolt squared timbers to the Screw-on access bracket MF75.



a ... centre-to-centre distance

A Screw-on access bracket MF75
C Squared timber



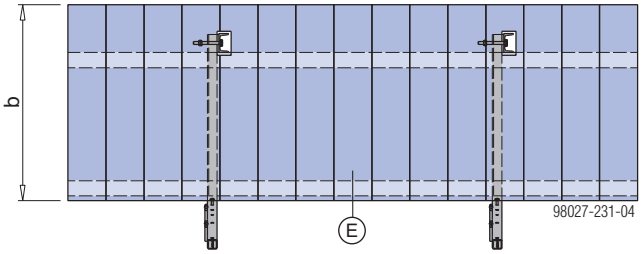
Bolting-items needed for each Screw-on access bracket:
- 2 square bolts M10
  (length will depend on the cross-section of the squared timbers)
- 2 washers 10
- 2 hexagon nuts M 10

The choice of platform beam will depend on the project.

Mounting the deck-boards

➤ Fasten deck-boards to the Doka beams with universal countersunk screws 6x90.

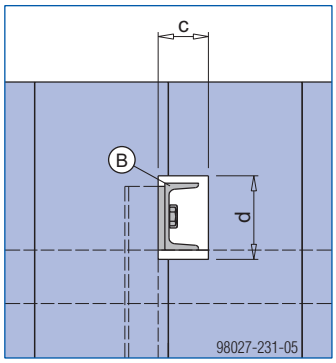
Every deck-board must be fixed with 4 screws!
Do a sight-check to make sure that the deck-boards have been fixed properly!



b ... 1030 mm (for straight walls)

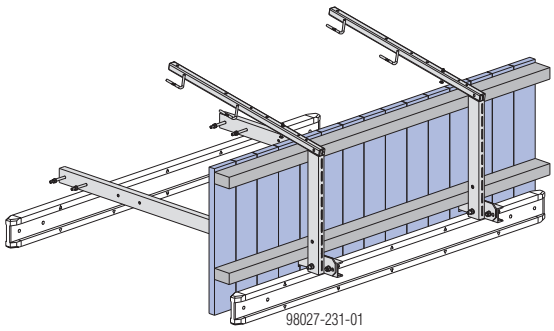
E Plank, 5x20 cm

Cut-out needed in platform decking for Suspension profile D15/D22:



c ... 70 mm
d ... 120 mm

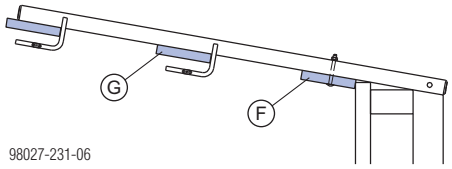
B Suspension profile D15/D22



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.



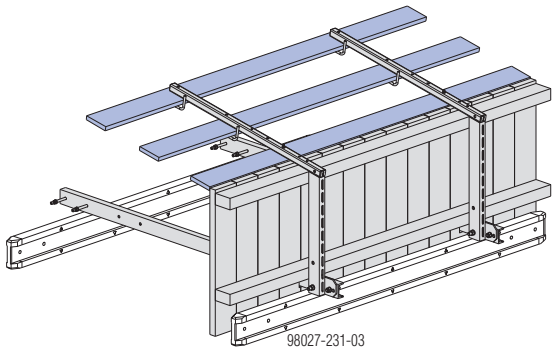
F Toeboard min. 15x3 cm

G Guard-rail board

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

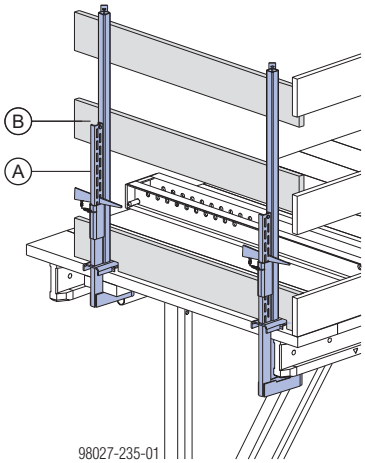
Platform railings which do not extend all the way around the platform must be closed by attaching side railings, e.g. at

- **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!
➤ Either use personal protective equipment to protect against falls (e.g. Doka personal fall-arrest set)
or
mount the sideguards at the same time as the platforms are assembled.

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.

Handrail clamp S



A Handrail clamp S
B Guard-rail board min. 3x15 cm (site-provided)

The sideguard consists of:

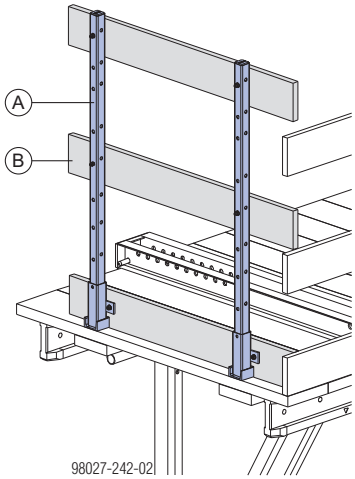
- 2 Handrail clamps S
- 3 guard-rail boards, min. 3x15 cm, (site-provided)

How to mount:

➤ Wedge the Handrail clamps firmly to the platform beams (clamping range 2 – 43 cm).
➤ Secure the guardrail boards to the loops on the Handrail clamp S with one 28 x 65 nail per loop.

Follow the directions in the “Handrail clamp S” User information!

Screw-on handrail post 1.50m

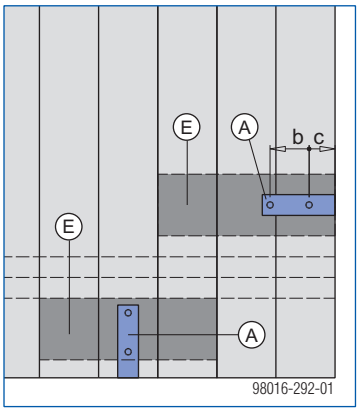


A Screw-on handrail post 1.50m
B Guard-rail board min. 3x15 cm (site-provided)

How to mount:

Important note:
➤ Screw planks to the underside of the deck-boards to distribute the loads.

➤ Bolt the Screw-on handrail post onto the platform decking.



b ... 150 mm
c ... 100 mm

A Screw-on handrail post 1.50m
E Plank, 5x20 cm

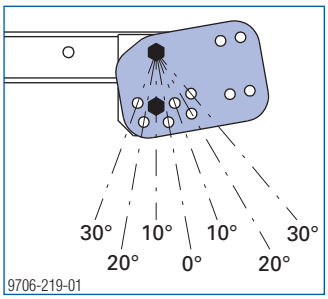
Required nuts & bolts etc. for each Screw-on handrail post

- 2 hexagon bolts M10
(length will depend on the thickness of the decking)
- 2 washers 10 (ISO 7094, on the timber side)
- 2 washers 10 (ISO 7089, on the steel side)
- 2 hexagon nuts M 10

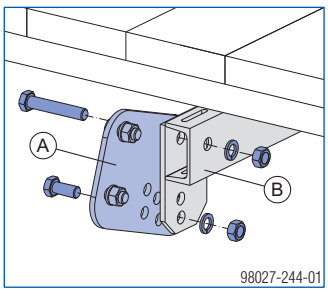
➤ Attach a toeboard (min. 15x3 cm) to the handrail-post uprights with M10 square bolts.
➤ Attach guard-rail boards to the handrail-post uprights with M10 square bolts.

Adjusting the inclination / widening the platform

Using the **Swivel plate MF**, the inclination of the platforms can be incrementally adjusted, and the working platform can be widened.



➤ Using M20x45 and M20x110 nuts & bolts etc., mount a Swivel plate MF to the Screw-on access bracket MF75 at the desired angle.

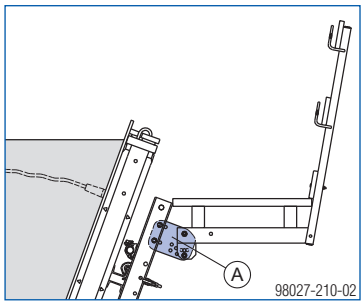


A Swivel plate MF
B Screw-on access bracket MF75

Each Screw-on access bracket MF75 is supplied complete with:

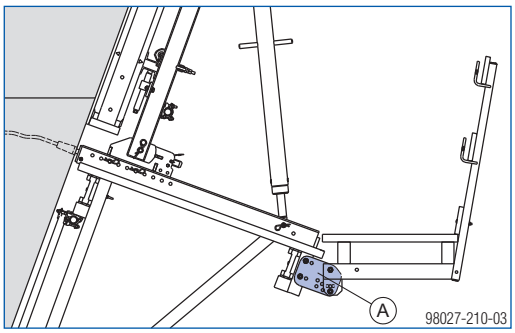
- 1 hexagon bolt M20x110
- 1 hexagon bolt M20x45
- 2 spring washers A20
- 2 hexagon nuts M20

e.g. on pouring platforms:



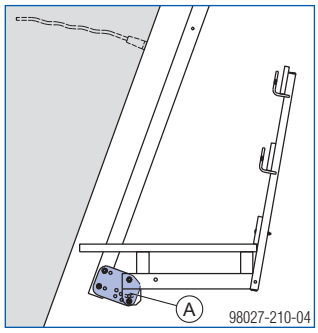
A Swivel plate MF

e.g. on working platforms:



A Swivel plate MF

e.g. on suspended platforms:



A Swivel plate MF

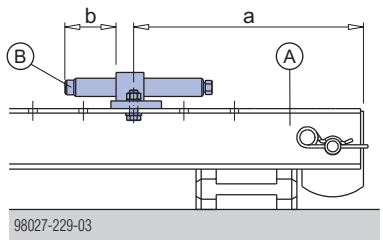
Assembling the vertical-waling unit

➤ Follow the shop drawing / assembly plan.

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.

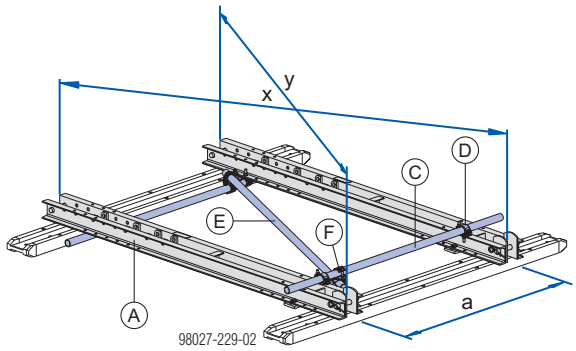


A Vertical waling D15
B Adjusting spindle

Check position 'a' of the adjusting spindle on the Vertical waling and change this if necessary.

Mounting the scaffold-tube bracing

➤ Lay down the Vertical walings, spaced apart by the exact centre-to-centre distance.
➤ Attach horizontal scaffold tubes.
➤ Arrange the Vertical walings so that both diagonals are the same.
➤ Attach a diagonal scaffold tube.
Distance between screw-on coupler and swivel coupler: max. 160 mm.



a ... centre-to-centre distance
x = y ... diagonals

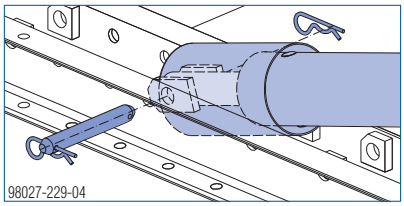
A Vertical waling D15
C Scaffolding tube 48.3mm (horizontal)
D Screw-on coupler 48mm 50
E Scaffolding tube 48.3mm (diagonal)
F Swivel coupler 48mm

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

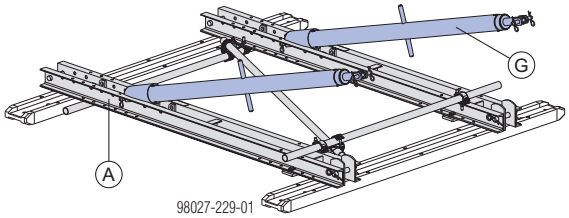
Note:
To make it possible to mount the ladders providing access to the pouring platforms, the scaffold tubes must be mounted in the positions shown.

Mounting the Spindle struts

➤ Pin the Spindle strut to the Vertical waling with a Swivel bolt 185 and secure this with 2 spring cotters.



➤ Set the length of the Spindle struts as shown in the shop drawing / assembly plan.
Make sure that the Plumbing spindles are extended the same distance at either end of each spindle.

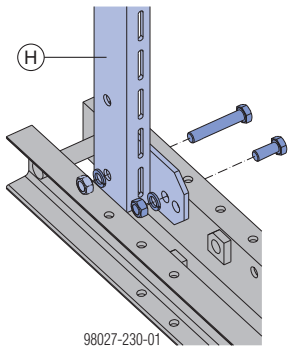
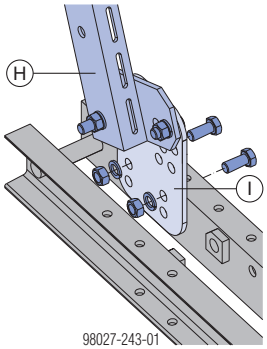


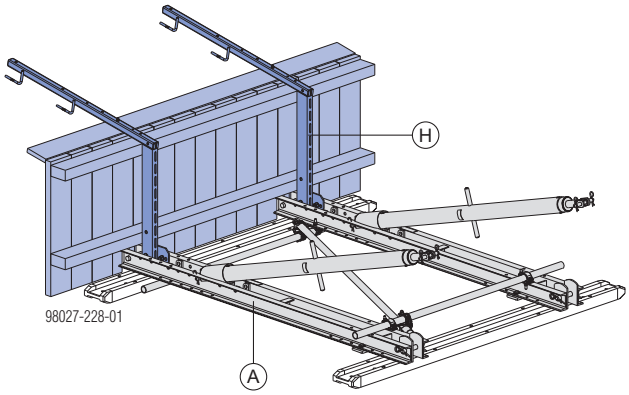
A Vertical waling D15
G Spindle strut D15 3.00m

Mounting the pouring platform

Only when the Screw-on access bracket MF75 is being used as a pouring platform.

➤ Mount the pre-assembled pouring platform to the Vertical walings (see the section headed ' Mounting the pouring platform').

Pouring platform without Swivel plate MF	Pouring platform with Swivel plate MF
	



A Vertical waling D15
H Screw-on access bracket MF75
I Swivel plate MF

Each Screw-on access bracket MF75 is supplied complete with:

- 1 hexagon bolt M20x110
- 1 hexagon bolt M20x45
- 2 spring washers A20
- 2 hexagon nuts M20

Each Swivel plate MF is supplied complete with:

- 2 hexagon bolts M20x45
- 2 spring washers A20
- 2 hexagon nuts M20

Mounting the formwork

➤ Follow the shop drawing / assembly plan.

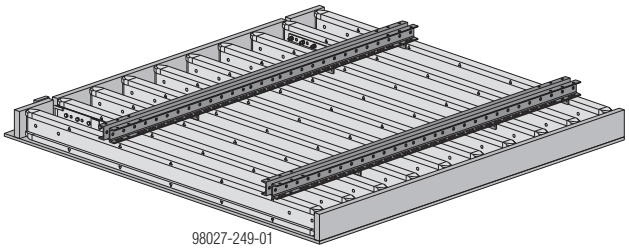
Timber-beam formwork

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.



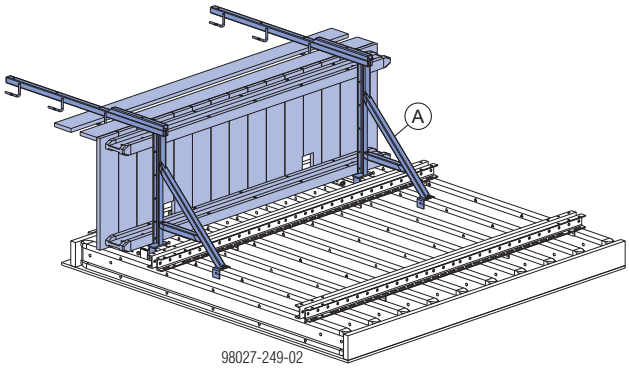
98027-249-01

Mounting the pouring platform

Instead of the Screw-on access bracket MF75, a platform assembled from brackets can be mounted directly to the formwork.

➤ 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.



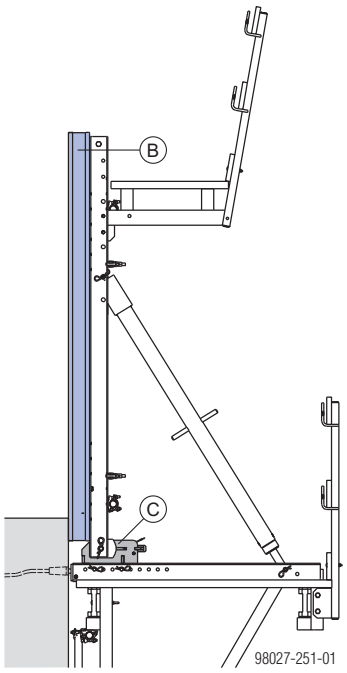
98027-249-02

A Universal bracket 90

Steel formwork

Steel formwork must always be planned and dimensioned on a project-specific basis:

- It must be possible to attach Waling-to-bracket holders
- It must be possible to support the adjusting spindles



98027-251-01

B Steel formwork

C Swivel bearing plate D15 S

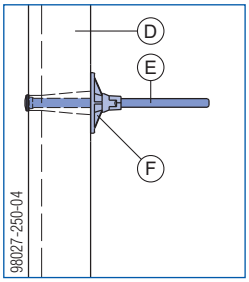
Framed formwork

e.g. framed formwork Framax Xlife

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

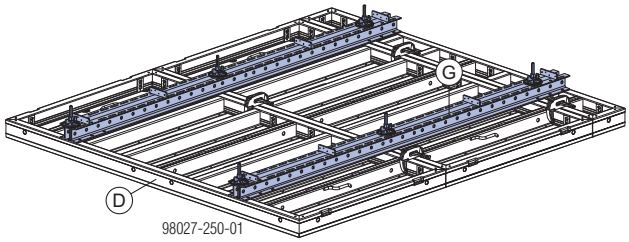
Preparing the formwork

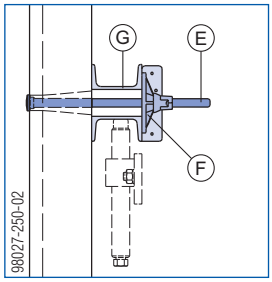
➤ With the formwork panels in the upright, fit 'Framax supporting construct. frame bolts' into the tie-holes and secure them with Super-plates 15.0.



D Framed formwork Framax Xlife
E Framax supporting construct. frame bolt 36cm
F Super-plate 15.0

➤ Set the gang-form down on a flat surface, with the form-ply facing downwards.
➤ Attach Multi-purpose walings WS10 to the gang-form using Framax supporting construct. frame bolts 36cm and Super-plates 15.0.





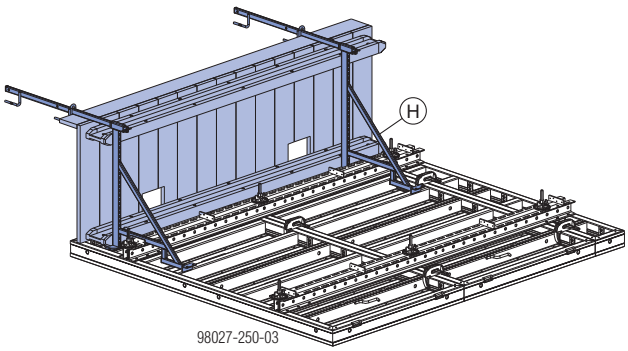
The length of the Multi-purpose waling WS10 Top50 will depend on the width of the gang-form.

D Framed formwork Framax Xlife
E Framax supporting construct. frame bolt 36cm
F Super-plate 15.0
G Multi-purpose waling WS10 Top50

Mounting the pouring platform

Instead of the Screw-on access bracket MF75, a platform assembled from brackets can be mounted directly to the formwork.

➤ Attach Framax 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.



H Framax bracket 90

Dismantling

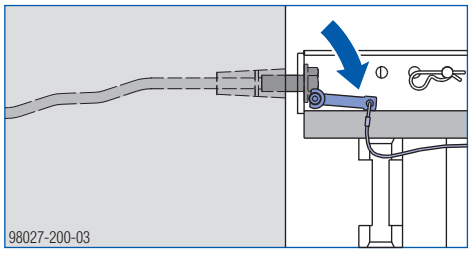
Important note:

- 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

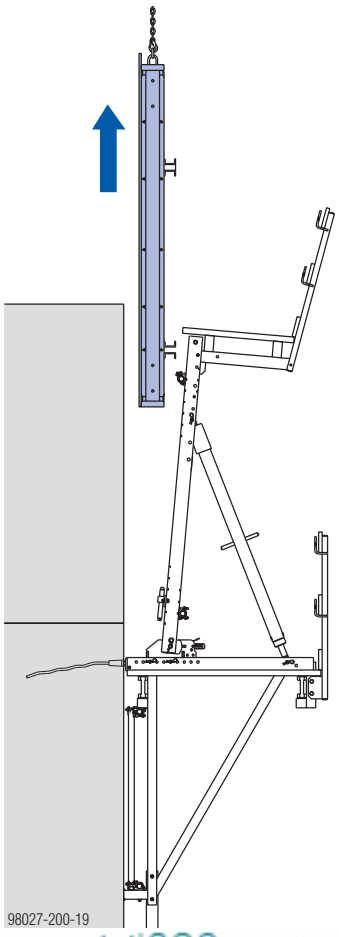
➤ Striking (see the section headed 'Opening the formwork').

The connection bolt must be in the horizontal!



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

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



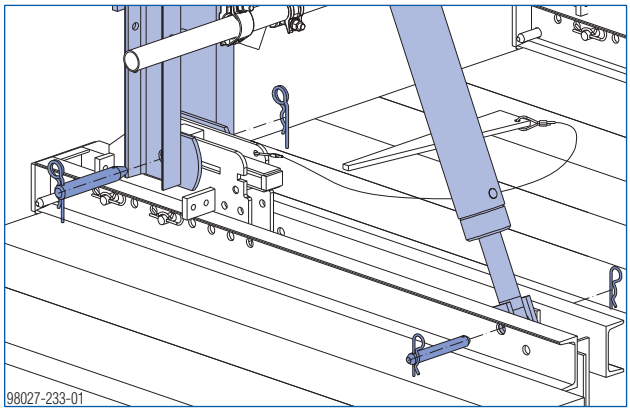
➤ Set down and dismantle the formwork element.

➤ Attach the lifting chain to the suspension bolts of the Vertical waling.

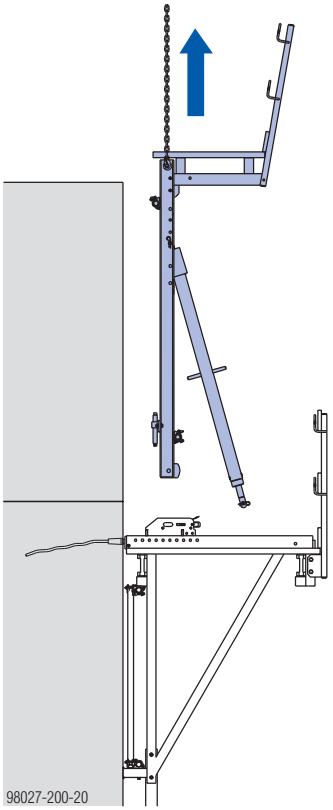
➤ Undo the pinned connection between the Vertical waling and the Swivel bearing plate.

➤ Undo the pinned connection between the Spindle strut and the Cantilever bracket.

➤ Fix the pin of the Spindle strut into the Cantilever bracket and secure it with 2 spring cotters (crane hoisting point).



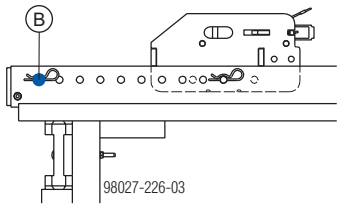
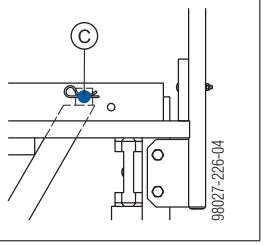
➤ Lift the vertical-waling unit off the climbing unit and set it down.



Lifting the climbing unit off the structure

➤ Pin the front swivel bolt of the Swivel bearing plate in the first pin-hole of the Cantilever bracket and secure it with 2 spring cotters.

➤ Attach the climbing unit to the crane with a four-part lifting chain (e.g. Doka 4-part chain 3.20m.

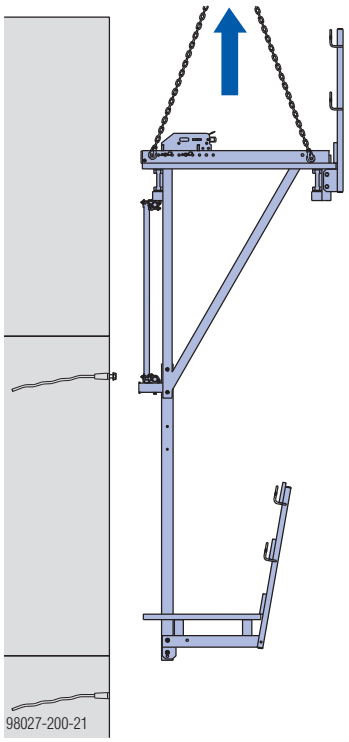
Front crane hoisting point	Rear crane hoisting point
	

B Swivel bolt d20 (Swivel bearing plate)

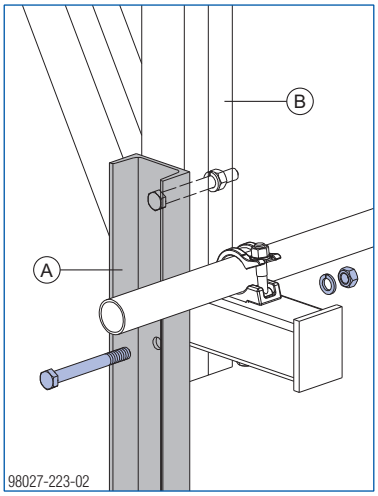
C Swivel bolt 185 (Spindle strut D15)

➤ 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.



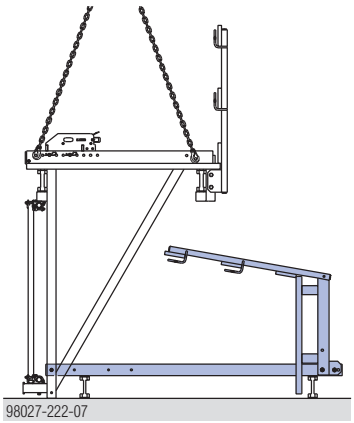
➤ Dismount the bottom hexagon bolts M16 from the Cantilever brackets.



A Suspension profile D15/D22

B Cantilever bracket D15

➤ Set down the climbing unit and dismantle it.

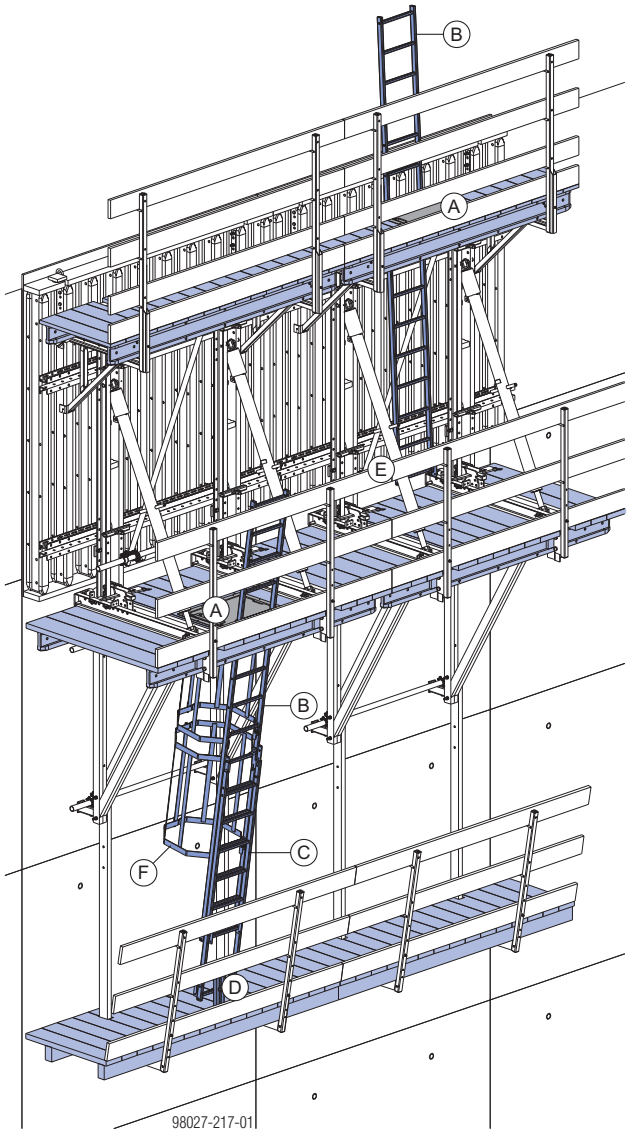


➤ All other dismantling steps are carried out on the ground, in the opposite order of steps from those in which the equipment was assembled.

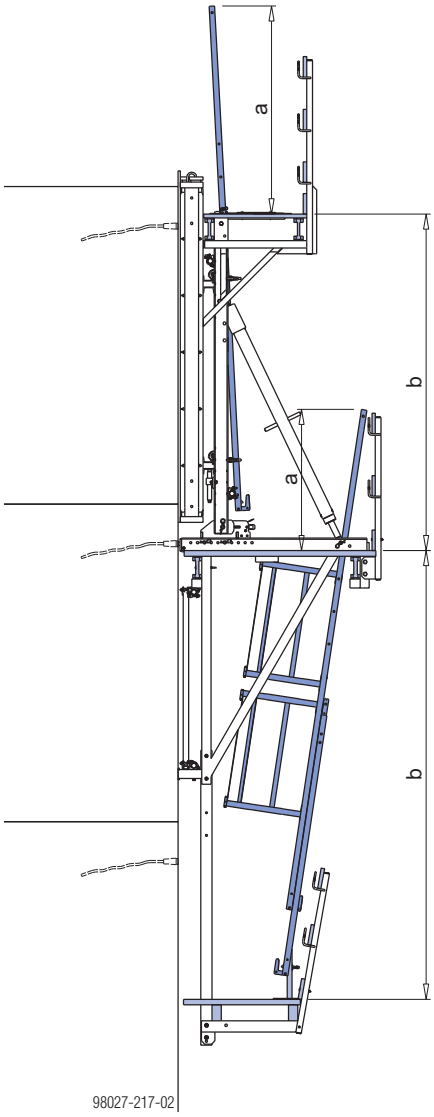
General remarks

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 clamp SK
F	Ladder cage XS



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

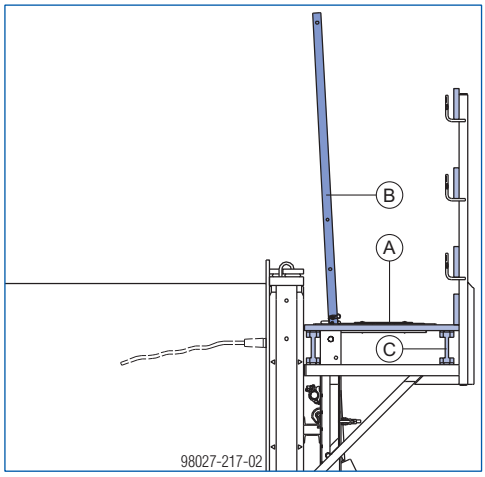
Note:
The Ladder system XS must be implemented in such a way that all national regulations are complied with.
Put up safety netting in the ladder and manhole zone, as required by the applicable regulations.

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

Mounting the ladders to the pouring platforms

For details of how to attach the ladders to the formwork, see the User Information booklets 'Large-area formwork Top 50' or 'Framed formwork Framax Xlife'.

On pouring platforms with decking supports, the Manhole B70/60 cm can be used.



A Manhole B 70/60cm
B System ladder XS 4.40m
C Decking support

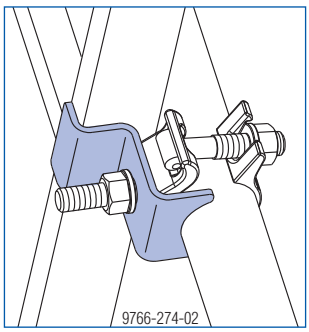
Important note:

Leave sufficient clearance between the bottom of the ladder and the decking of the working platform (so that the formwork can still be travelled forward and back freely during formwork set-up and removal).

Fixing the ladders to the bracing tubes

CAUTION
The Ladder clamp SK does not sustain vertical loads!
➤ The Ladder clamp SK must only be used in conjunction with a Ladder bolt XS or a Connector XS for wall formwork.

➤ Fix both ladder stiles to the scaffold-tube bracing using Ladder clamps SK and screw-on couplers 48mm 50.



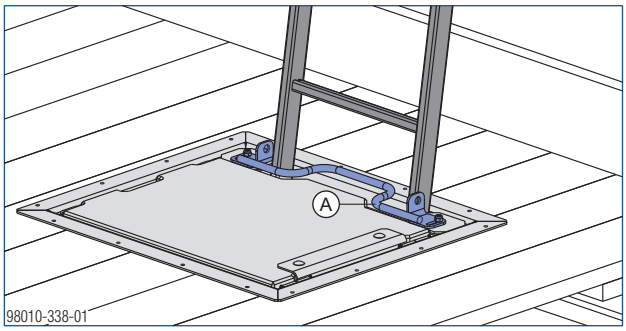
Mounting the ladders to the working platform and to the suspended platforms

on casting-section heights of up to 3.40 m

Manhole B 70/60cm

For details of how to mount the manhole, see "Assembling the working platform".

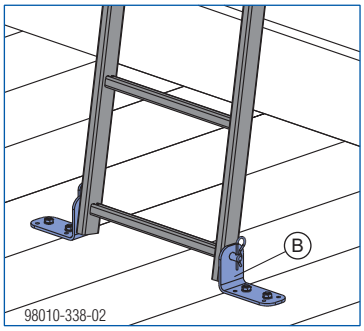
➤ Fix the System ladder XS 4.40m to the manhole with a ladder stirrup.



A Ladder bow

➤ Screw the Ladder adapter SK to the platform decking.
Nuts & bolts etc. required for each Ladder adapter SK:
8 universal countersunk screws 5x50

➤ Pin the System ladder XS 4.40m into the Ladder adapter SK and secure the pins on both sides with a d4 spring cotter.



B Ladder adapter SK

Manhole lid

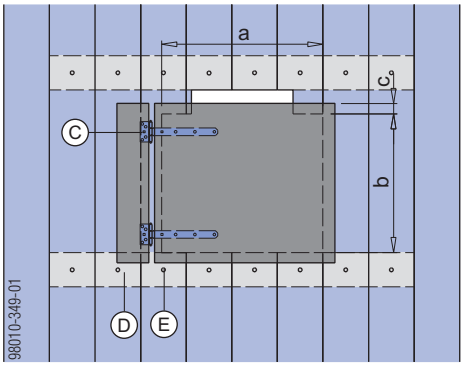
An alternative way of providing a platform manhole is to construct a hinged manhole lid.

➤ Screw planks to the underside of the deck-boards to stiffen them.

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.



a ... max. 700 mm
b ... max. 600 mm
c ... Overlap min. 50 mm

C Cover hinge SK 35cm
D Deck-board, 5x20 cm
E Square bolt M10 + hexagon nut M10

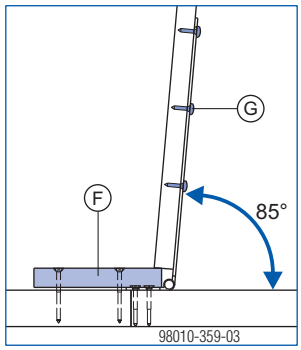
CAUTION

When choosing what type of manhole lid to use, make sure that it has sufficient load-bearing capacity!

It is forbidden to use 21mm or 27mm 3-ply sheeting for the manhole lid.

➤ Use a 32mm web board or equivalent 21mm multi-ply formwork sheets with non-skid surfacing.

➤ Fix a Cover hinge SK 35cm to the manhole lid and the platform.

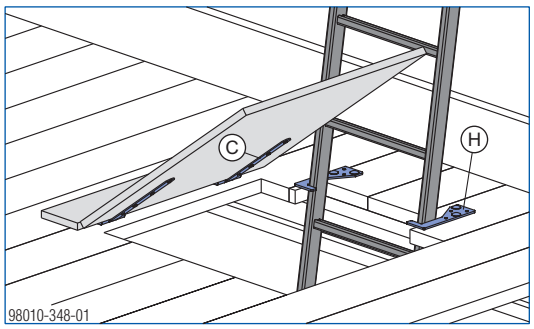


F Timber stop-bar
G Framax screw 7x22

If a timber stop-bar is screwed onto the platform decking behind the hinge, the lid can be made to be "self-closing".

The grain of the face layer of the manhole lid should run parallel to the longer side of the lid.

➤ Fix the System ladder XS 4.40m to the platform decking with a Ladder holder SK.



C Cover hinge SK 35cm
H Ladder holder SK

Nuts & bolts etc. required for each ladder holder:
3 universal countersunk screws 5x50

➤ Screw the Ladder adapter SK to the platform decking.
Nuts & bolts etc. required for each Ladder adapter SK:
8 universal countersunk screws 5x50

➤ Pin the System ladder XS 4.40m into the Ladder adapter SK and secure the pins on both sides with a d4 spring cotter.

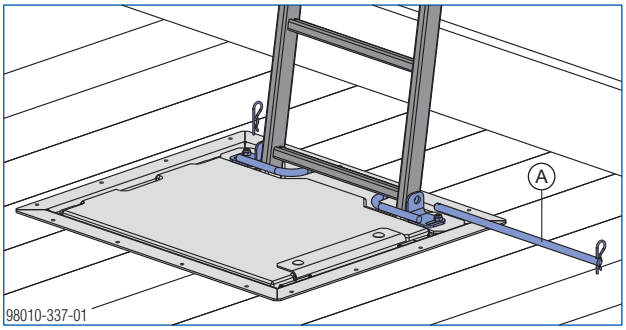
on casting-section heights of over 3.40m

Manhole B 70/60cm

For details of how to mount the manhole, see "Assembling the working platform".

➤ 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.

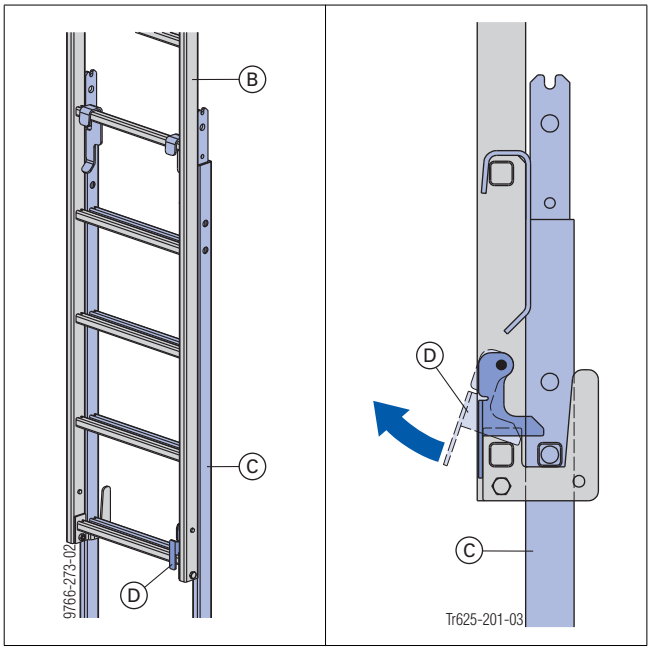


A Ladder bolt XS

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.



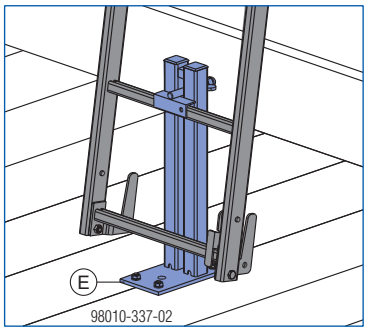
B System ladder XS 4.40m

C Ladder extension XS 2.30m

D Safety latch

➤ Screw the Ladder adapter XS to the platform decking.

➤ Fix the bottom of the ladder to the Ladder adapter XS.



E Ladder adapter XS

Nuts & bolts etc. required for each Ladder adapter XS

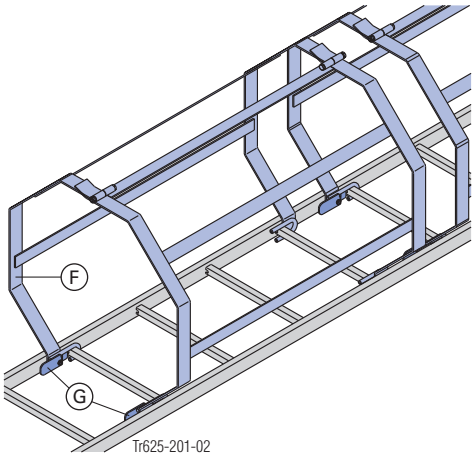
- 4 square bolts M10x70
- 4 washers A 10.5
- 4 hexagon nuts M 10

Ladder cage

Important note:

➤ 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 onto the next available rung. The safety latches prevent the cage being accidentally lifted out. Add further Ladder cages XS 1.00m, in each case fixing them onto the next available rung.

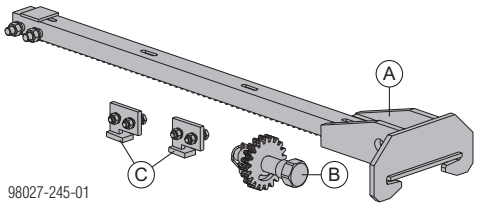


F Ladder cage XS 1.00m

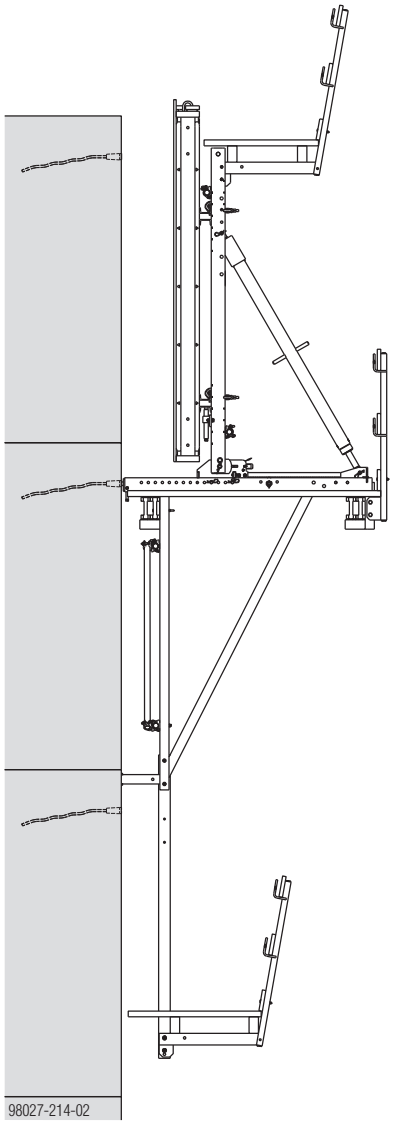
G Safety latch

Design variant: Dam formwork D15/3 - retractable

The D15/3 is tiltable as standard. The Dam formwork D15/3 can easily be modified to equip it with a travelling unit. This makes the formwork retractable as well.

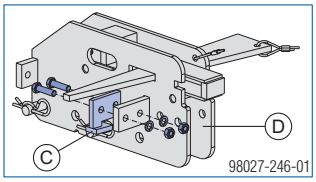


Retraction set D15, consisting of:
A ... Travelling profile D15
B ... Drive shaft D15
C ... Anti-liftout plate D15



Assembling the Retraction set

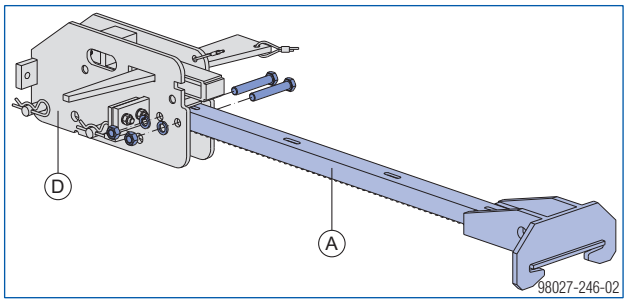
➤ Bolt anti-liftout plates onto both sides of the Swivel bearing plate.



C Anti-liftout guard D15
D Swivel bearing plate D15

Each anti-liftout plate is supplied complete with:
- 2 hexagon bolts M12x45
- 2 spring washers A12
- 2 hexagon nuts M12

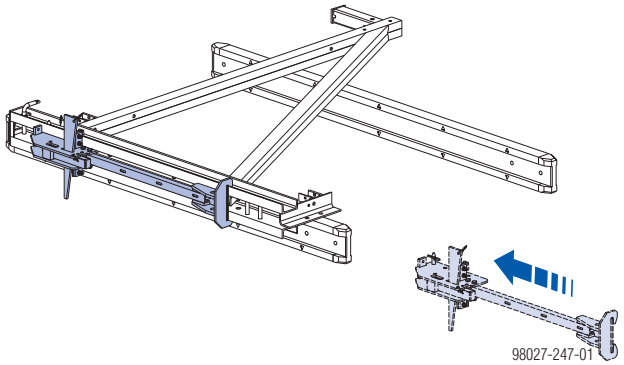
➤ Bolt the Travelling profile into the Swivel bearing plate.



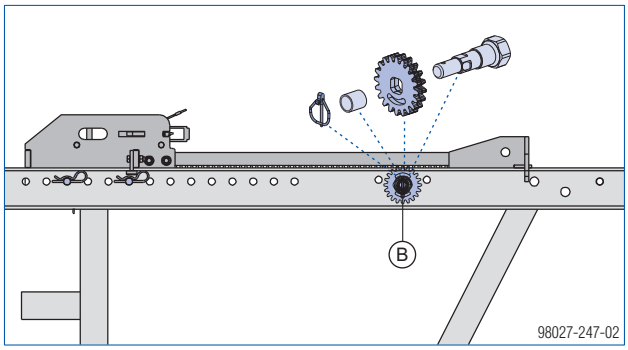
A Travelling profile D15
D Swivel bearing plate D15

Each Travelling profile is supplied complete with:
- 2 hexagon bolts M16x100
- 2 spring washers A16
- 2 hexagon nuts M16

➤ Push the Travelling profile onto the Cantilever bracket. The catches must engage in the horizontal profile.



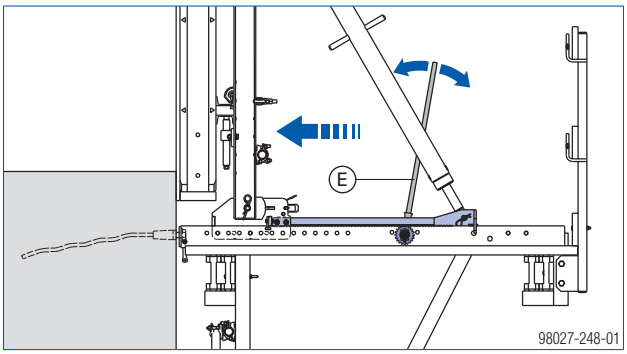
- Mount the pinion gear drive to the appropriate position in the Cantilever bracket.
- Pin the Swivel bearing plate D15 into the Cantilever bracket with both pins.



D Pinion gear drive

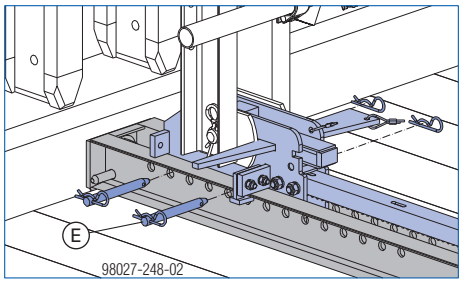
Closing the formwork

- Undo the pinned connections between the Swivel bearing plate D15 and the Cantilever bracket.
- By operating the ratchets simultaneously, move the travelling units forward (together with the formwork) until they meet the top of the previously cast section.



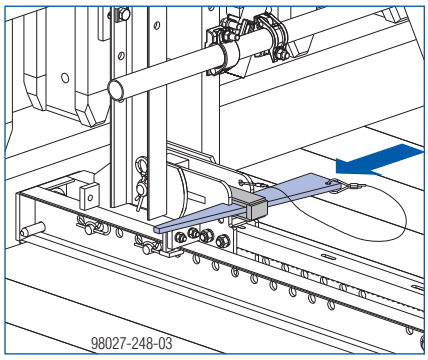
E Ratchet MF 3/4" SW50

- Pin the Swivel bearing plate D15 into the Cantilever bracket with both pins (position as shown in shop drawing / assembly plan).
- Adjust the formwork and level the positioning-points. See the section headed "Plumbing & aligning".

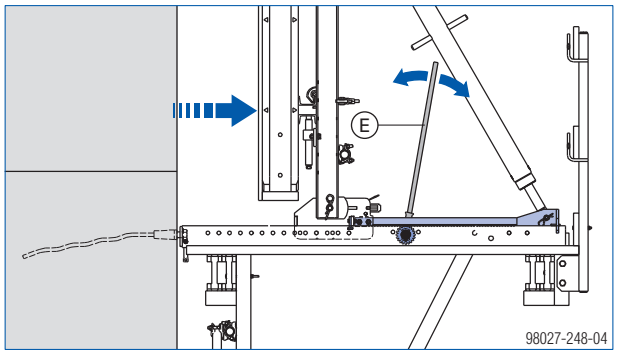


Opening the formwork

- Remove the Cone screw B 7cm from the positioning-point.
- Remove the connectors from the adjacent gang-forms.
- Remove the wedge from the press-tight position.
- Hammer in the wedge in the release position.

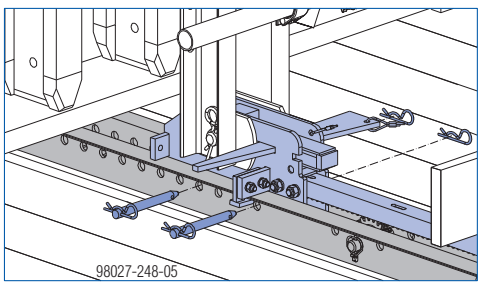


- By operating the ratchets simultaneously, roll back the travelling units (together with the formwork).



E Ratchet MF 3/4" SW50

- Pin the Swivel bearing plate D15 into the Cantilever bracket with both pins (position as shown in shop drawing / assembly plan).



Transporting, stacking and storing

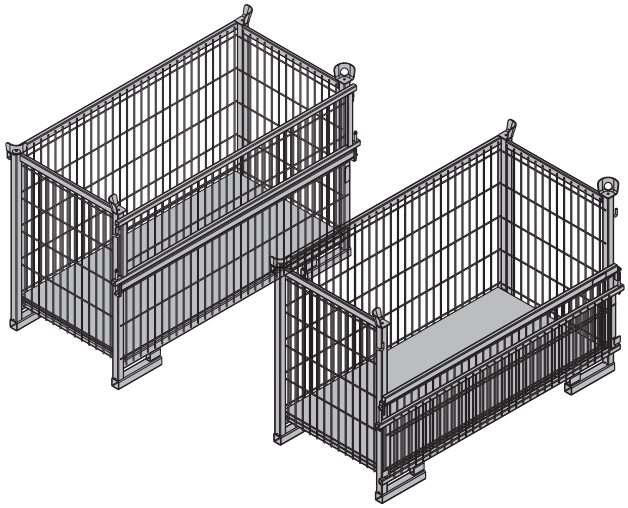
The following instructions must be complied with when storing and transporting separate parts or assemblies. This ensures careful, safe treatment of the equipment:

- The parts must be onloaded 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 devices for small items:

- durable
- stackable

Suitable transport appliances:

- crane
- pallet stacking truck
- forklift truck

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

Max. load: 700 kg
Permitted imposed load: 3150 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

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

Max. n° of boxes on top of one another

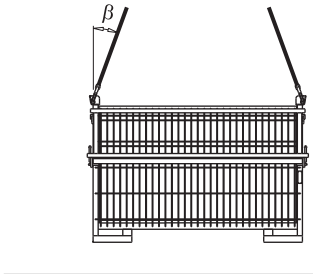
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
2	5
It is not allowed to stack empty pallets on top of one another!	

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

Lifting by crane

➤ Only lift the boxes when their sidewalls are closed!

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

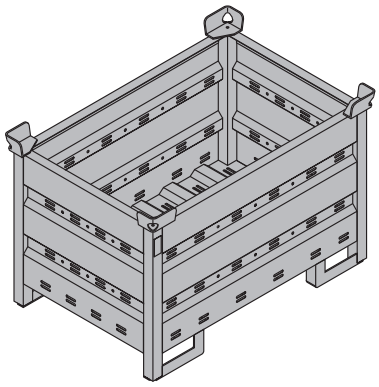


9234-203-01

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 1.20x0.80m galv.



Storage and transport devices for small items:
- durable
- stackable

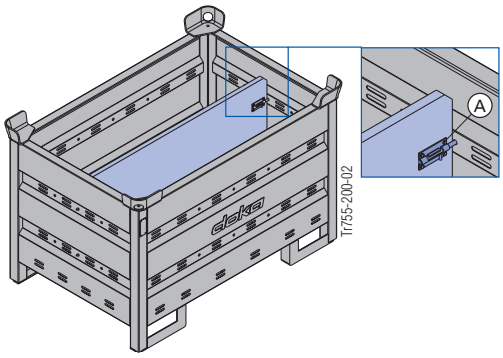
Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

Max. load: 1500 kg Permitted imposed load: 7900 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

Multi-trip transport box partition

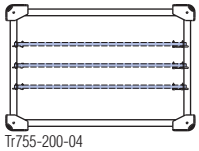
Different items in the Multi-trip transport box can be kept separate with the Multi-trip transport box partitions 1.20m or 0.80m.

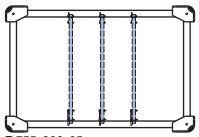


A Slide-bolt for fixing the partition

Possible ways of dividing the box

Multi-trip transport box partition	Lengthways	Crossways
1.20m	max. 3 partitions	-
0.80m	-	max. 3 partitions


Tr755-200-04


Tr755-200-05

Using Doka multi-trip transport boxes as storage units

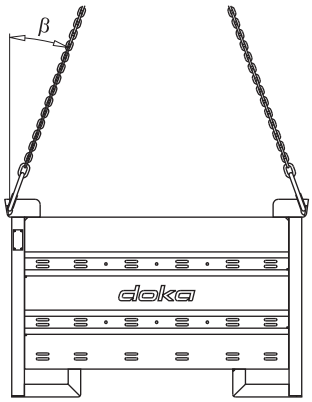
Max. n° of boxes on top of one another

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

Using Doka multi-trip transport boxes as transport devices

Lifting by crane

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain (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.

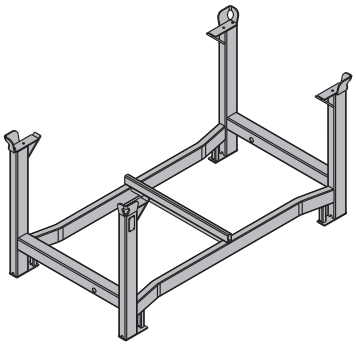
Doka stacking pallet 1.55x0.85m and 1.20x0.80m

Storage and transport devices for long items:
- durable
- stackable

Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

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

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



Max. load: 1100 kg
Permitted imposed load: 5900 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

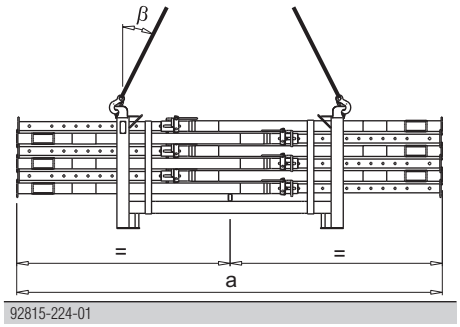
Outdoors (on the site) Floor gradient up to 3%	**Indoors** Floor gradient up to 1%
2	6
It is not allowed to stack empty pallets on top of one another!	

- **How to use with bolt-on castor set:**
  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

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Load the items centrically.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.
- When lifting stacking pallets to which Bolt-on castor sets B have been attached, you must also follow the directions in these Operating Instructions!
- Spread-angle β max. 30°!



	a
Doka stacking pallet 1.55x0.85m	max. 4.0 m
Doka stacking pallet 1.20x0.80m	max. 3.0 m

Repositioning by forklift truck or pallet stacking truck

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

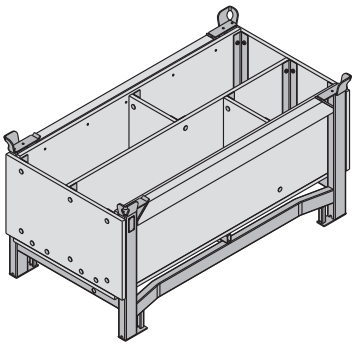
Doka accessory box

Storage and transport devices for small items:
- durable
- stackable

Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

The Doka accessory box is the tidy, easy-to-find way of storing and stacking all interconnection and form-tie components.
The Bolt-on caster set B turns the stacking pallet into a fast and manoeuvrable transport trolley.

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



Max. load: 1000 kg
Permitted imposed load: 5530 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

Doka accessory box as storage units

Max. n° of boxes on top of one another

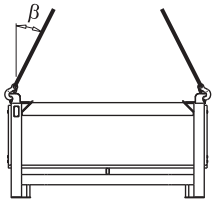
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
3	6
It is not allowed to stack empty pallets on top of one another!	

- **How to use with bolt-on castor set:**
  Always apply the fixing brake when the container is "parked".
  When Doka accessory boxes are stacked, the bottom box must NOT be one with a bolt-on castor set mounted to it.

Doka accessory box as transport devices

Lifting by crane

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- When lifting stacking pallets to which Bolt-on castor sets B have been attached, you must also follow the directions in these Operating Instructions!
- Spread-angle β max. 30°!



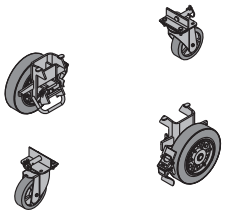
92816-206-01

Repositioning by forklift truck or pallet stacking truck

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

Bolt-on castor set B

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

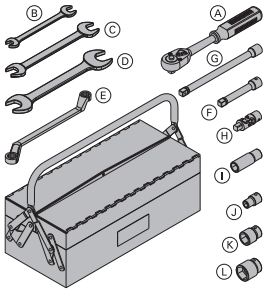
Follow the directions in the Operating Instructions!

	[kg]	Article n°
Cantilever bracket D15 K Sperrenkonsole D15 K Painted blue Width: 166 cm Delivery condition: railing included	136.4	580630000
Cantilever bracket D15/3 Sperrenkonsole D15/3 Painted blue Width: 215 cm Delivery condition: railing included	170.0	580631000
Retraction set D15 Rückfahrset D15 Galvanised Length: 114 cm	21.0	580637000
Vertical waling D15 3.00m U120	87.6	580632000
Vertical waling D15 3.50m U140 Sperrenriegel D15 Painted blue	119.7	580638000
Spindle strut D15 3.00m Spindelstrebe D15 3,00m Painted blue Length: 211 - 252 cm	38.0	580633000
Swivel bearing plate D15 Gelenkaufsatz D15 Painted blue Length: 43.5 cm Height: 22.8 cm	20.8	580634000
Swivel bearing plate D15 S Gelenkaufsatz D15 S Painted blue Length: 36.8 cm Height: 22.4 cm	18.5	580635000
Suspension profile D15/D22 Hängeprofil D15/D22 Galvanised Height: 260 cm	28.6	580621000
Screw-on access bracket MF75 Anschraubbühne MF75 Galvanised Length: 113 cm Height: 152 cm	19.0	580669000
Manhole B 70/60cm Bühnendurchstieg B 70/60cm Steel parts galvanised Timber parts varnished yellow Length: 81 cm Width: 71 cm	22.0	581530000
Swivel plate MF Schwenkplatte MF Galvanised Length: 29 cm Height: 20 cm	4.5	580672000
Handrail clamp S Schutzgeländerzwinge S Galvanised Height: 123 - 171 cm	11.5	580470000

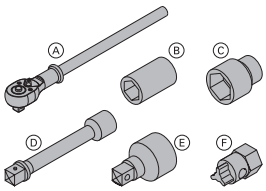
	[kg]	Article n°
Wind bracing MF/150F/K 6.00m Windabspannung MF/150F/K 6,00m Galvanised	**4.7**	**580665000**
Waling-to-bracket holder 9-15cm Riegelhalter 9-15cm Galvanised	**2.7**	**580625000**
Waling-to-bracket holder Keilriegelhalter Galvanised Length: 26 cm Height: 31 cm	**2.5**	**580526000**
Framax supporting construct. frame bolt 36cm Framax-Bockschraube 36cm Galvanised	**0.62**	**580505000**
Starter block unit D15 Grundblockriegel D15 Painted blue Length: 145 cm	**48.2**	**580636000**
Anchor waling 1.95m **Anchor waling 2.95m** Ankerriegel Painted blue	**76.3** **110.0**	**580545000** **580546000**
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 48.3mm .....m** Gerüstrohr 48,3mm Galvanised	**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**

	[kg]	Article n°
Screw-on coupler 48mm 50 **Screw-on coupler 48mm 95** Anschraubkupplung Galvanised Width-across: 22 mm Follow fitting instructions!	**0.84** **0.88**	**682002000** **586013000**
Swivel coupler 48mm Drehkupplung 48mm Galvanised Width-across: 22 mm Follow fitting instructions!	**1.5**	**582560000**
Lifting beam 110kN 6.00m Umsetzbalken 110kN 6,00m Galvanised Length: 626 cm Follow the directions in the "Operating Instructions"!	**136.5**	**586359000**
Warning sign "No entry" 300x300mm Verbotsschild "Zutritt Verboten" 300x300mm	**0.70**	**581575000**
Doka personal fall-arrest set Doka-Sicherheitsgeschirr Follow the directions in the "Operating Instructions"!	**3.6**	**583022000**
Ratchet MF 3/4" SW50 Antriebsknarre MF 3/4" SW50 Galvanised	**3.8**	**580648000**

	[kg]	Article n°
Tool box GF	**6.5**	**580390000**
GF-Werkzeugbox		
included in scope of supply:		
(A) **Reversible ratchet 1/2"**	**0.73**	**580580000**
Galvanised		
Length: 30 cm		
(B) **Fork wrench 13/17**	**0.08**	**580577000**
(C) **Fork wrench 22/24**	**0.22**	**580587000**
(D) **Fork wrench 30/32**	**0.80**	**580897000**
(E) **Ring spanner 17/19**	**0.27**	**580590000**
(F) **Extension 11cm 1/2"**	**0.20**	**580581000**
(G) **Extension 22cm 1/2"**	**0.31**	**580582000**
(H) **Universal joint coupling**	**0.16**	**580583000**
(I) **Box nut 19 1/2" L**	**0.16**	**580598000**
(J) **Box nut 13 1/2"**	**0.06**	**580576000**
(K) **Box nut 24 1/2"**	**0.12**	**580584000**
(L) **Box nut 30 1/2"**	**0.20**	**580575000**

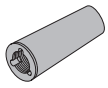


Additional tools MF	**4.1**	**580682000**
Zusatzwerkzeuge MF		
consisting of:		
(A) **Reversible ratchet 3/4"**	**1.5**	**580894000**
Galvanised		
Length: 50 cm		
(B) **Box nut 17 1/2"**	**0.07**	**580685000**
(C) **Box nut 50 3/4"**	**0.81**	**581449000**
(D) **Extension 20cm 3/4"**	**0.68**	**580683000**
(E) **Transition piece A 1/2"x3/4"**	**0.18**	**580684000**
(F) **Universal cone spanner 15.0/20.0**	**0.90**	**581448000**
Galvanised		
Length: 9 cm		
Width-across: 50 mm		



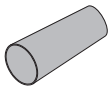
Tie rod system 20.0

	[kg]	Article n°
Universal climbing cone 20.0	**1.2**	**581442000**
Universal-Kletterkonus 20,0		



Galvanised
Length: 13 cm
Diameter: 5 cm
Tool: Spanner for universal climbing cone 15.0/20.0

Sealing sleeve K 20.0	**0.03**	**581443000**
Dichtungshülse K 20,0		

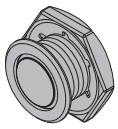


yellow-green
Length: 12 cm
Diameter: 6 cm

Cone screw B 7cm	**0.86**	**581444000**
Konusschraube B 7cm		

red
Length: 10 cm
Diameter: 7 cm
Width-across: 50 mm

Form-ply protector 32mm	**0.38**	**580220000**
Schalhautschutz 32mm		

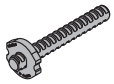


Width-across: 70 mm

Pigtail anchor 20.0	**2.0**	**581450000**
Wellenanker 20,0		

Non-treated
Length: 76 cm

Stop anchor 20.0 17.5cm	**0.62**	**581457000**
Sperranker 20,0 17,5cm		

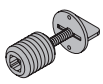


Non-treated

Stop anchor 20.0 40cm	**1.2**	**581458000**
Sperranker 20,0 40cm		

Non-treated

Positioning clamp M30	**0.19**	**581833000**
Vorlaufklemme M30		



Galvanised
Diameter: 4 cm

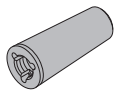
Positioning disk M30	**0.25**	**581975000**
Vorlaufscheibe M30		

Galvanised
Diameter: 9 cm

[kg] Article n°

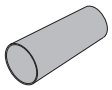
Tie rod system 26.5

Universal climbing cone 26.5 1.1 581987000
Universal-Kletterkonus 26,5



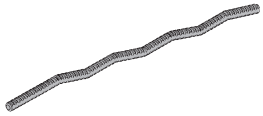
Galvanised
Length: 12.6 cm
Diameter: 5 cm
Tool: Spanner for universal climbing cone 15.0/20.0

Sealing sleeve K 26.5 0.02 581998000
Dichtungshülse K 26,5



light blue
Length: 12 cm
Diameter: 6 cm

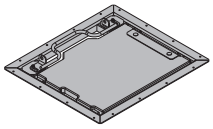
Pigtail anchor 26.5 3.6 581900000
Wellenanker 26,5



Non-treated
Length: 80 cm

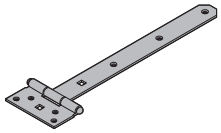
Ladder system XS

Manhole B 70/60cm 22.0 581530000
Bühnendurchstieg B 70/60cm



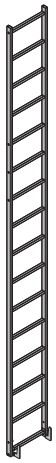
Steel parts galvanised
Timber parts varnished yellow
Length: 81 cm
Width: 71 cm

Cover hinge SK 35cm 0.30 581533000
Deckelscharnier SK 35cm



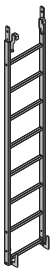
Galvanised

System ladder XS 4.40m 33.2 588640000
System-Leiter XS 4,40m



Galvanised

Ladder extension XS 2.30m 19.1 588641000
Leiternverlängerung XS 2,30m

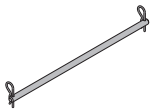


Galvanised

Ladder clamp SK 0.23 581239000
Leiternklemme SK

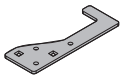
Galvanised
Length: 8 cm

Ladder bolt XS 0.85 581561000
Leiternbolzen XS



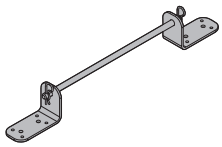
Galvanised
Length: 51 cm

Ladder holder SK 0.36 581532000
Leiternhalter SK



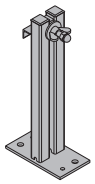
Galvanised

Ladder adapter SK 2.3 581531000
Leiternfuß SK



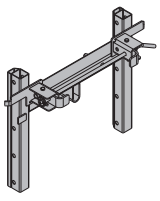
Galvanised

Ladder adapter XS 5.0 588673000
Leiternfuß XS



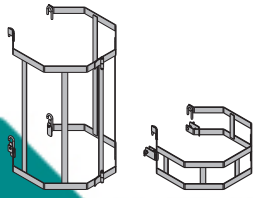
Galvanised
Height: 50 cm

Connector XS Wall formwork 20.8 588662000
Anschluss XS Wandschalung



Galvanised
Width: 89 cm
Height: 63 cm

Ladder cage XS 1.00m 16.5 588643000
Ladder cage XS 0.25m 10.5 588670000
Rückenschutz XS



Galvanised

Multi-trip packaging

	[kg]	Article n°
Doka skeleton transport box 1.70x0.80m Doka-Gitterbox 1,70x0,80m Galvanised Height: 113 cm	87.0	583012000
Doka multi-trip transport box 1.20x0.80m Doka-Mehrwegcontainer 1,20x0,80m Galvanised Height: 78 cm	75.0	583011000
Multi-trip transport box partition 0.80m **Multi-trip transport box partition 1.20m** Mehrwegcontainer Unterteilung Timber parts varnished yellow Steel parts galvanised	3.7 5.5	583018000 583017000
Doka stacking pallet 1.55x0.85m Doka-Stapelpalette 1,55x0,85m Galvanised Height: 77 cm	42.0	586151000
Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m Galvanised Height: 77 cm	39.5	583016000
Doka accessory box Doka-Kleinteilebox Timber parts varnished yellow Steel parts galvanised Length: 154 cm Width: 83 cm Height: 77 cm	106.4	583010000
Bolt-on castor set B Anklemm-Radsatz B Painted blue	33.6	586168000

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