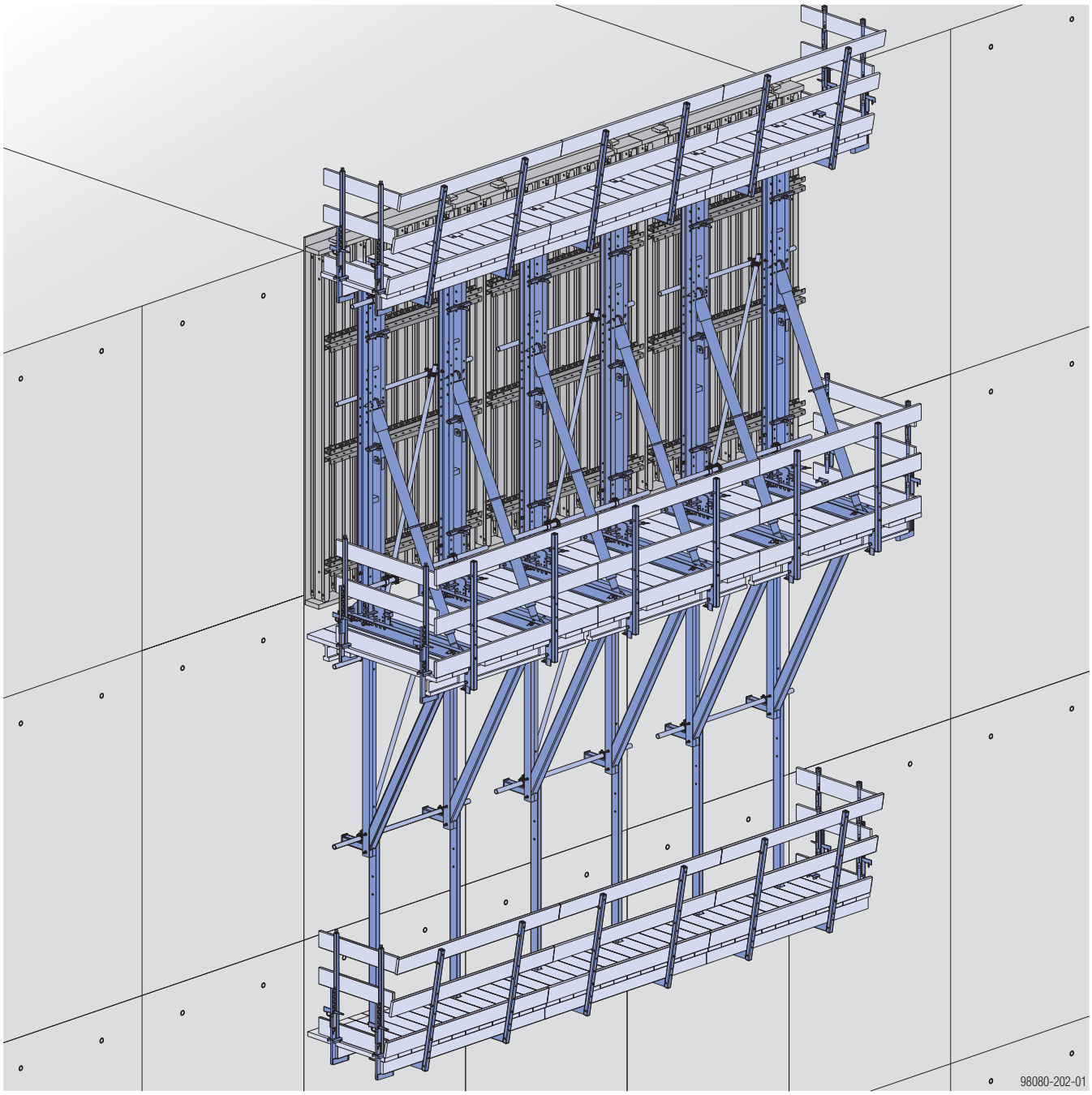
999808002 - 11/2022
en-GB

The Formwork Experts.

Dam formwork D22

User Information

Instructions for assembly and use (Method statement)



Contents

Introduction

Elementary safety warnings

User target groups

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

Hazard assessment

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

Remarks on this booklet

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

Planning

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

Regulations; industrial safety

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

Rules applying during all phases of the assignment

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

Assembly

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

Closing the formwork

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

Pouring

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

Stripping the formwork

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

Transporting, stacking and storing

- Observe all country-specific regulations applying to the handling of formwork and scaffolding. For system formwork the Doka slinging means stated in this booklet must be used – this is a mandatory requirement.
  If the type of sling is not specified in this document, the customer must use slinging means that are suitable for the application envisaged and that comply with the regulations.
- When lifting, always make sure that the unit to be lifted and its individual parts can absorb the forces that occur.
- Remove loose parts or secure them so that they cannot slip out of position and drop.
- When lifting formwork or formwork accessories with a crane, no persons must be carried along, e.g. on working platforms or in multi-trip packaging.
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this document!

Maintenance

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

Miscellaneous

The weights as stated are averages for new material; actual weights can differ, depending on material tolerances. Dirt accretions, moisture saturation, etc. can also affect weight.
We reserve the right to make alterations in the interests of technical progress.

Eurocodes at Doka

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

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

Allowance has been made for the following partial factors:

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

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

Symbols used

The following symbols are used in this document:

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

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

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

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

Instruction
Indicates that actions have to be performed by the user.

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

Tip
Points out useful practical tips.

Reference
Cross-references other documents.

Short instructions increase knowledge of safe anchorage to the structure

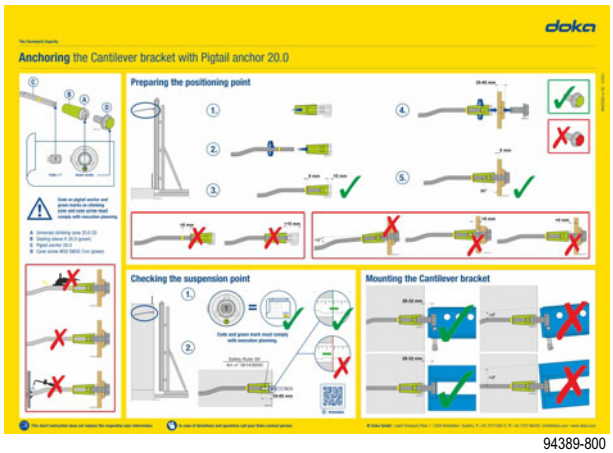
Doka puts the quality and safety of all of its formwork products first.

The most important part of a climbing scaffold is its entirely safe anchorage to the structure.

The short instructions tell the site crew how to prepare the positioning points and suspension points correctly.

The short instructions are available from Doka and must be posted by the customer at readily visible points, for example in the area of the main traffic routes of the working platforms.

Anchoring the Cantilever bracket with Pigtail anchor 20.0



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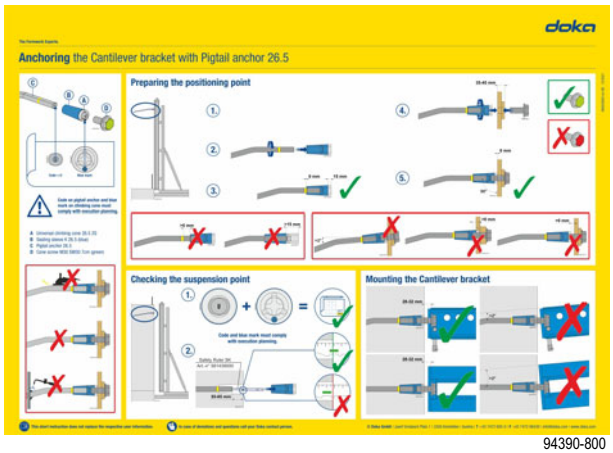
Anchoring the Cantilever bracket with Pigtail anchor 26.5



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For more information, please contact your Doka technician.

Services

Support in every stage of the project

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

Project assistance from start to finish

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

Efficient planning for a safe project sequence

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

Optimise construction workflows with Doka

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

Custom formwork and on-site assembly

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

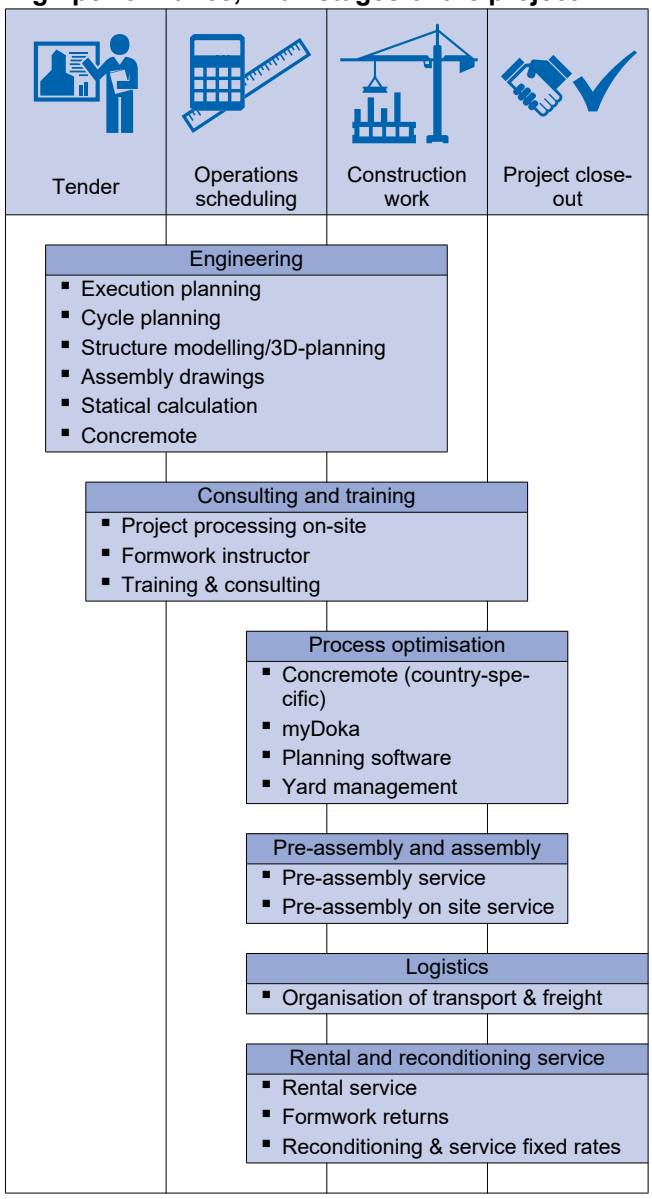
Just-in-time availability

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

Rental and reconditioning service

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

High performance, in all stages of the project



Digital Services
for higher productivity in construction

From planning to completion of construction - with our digital services we want to set the pace for boosting productivity in construction. Our digital portfolio includes solutions for planning, procuring and managing to performing on site. Learn more about our digital offer at doka.com/digital.

System description

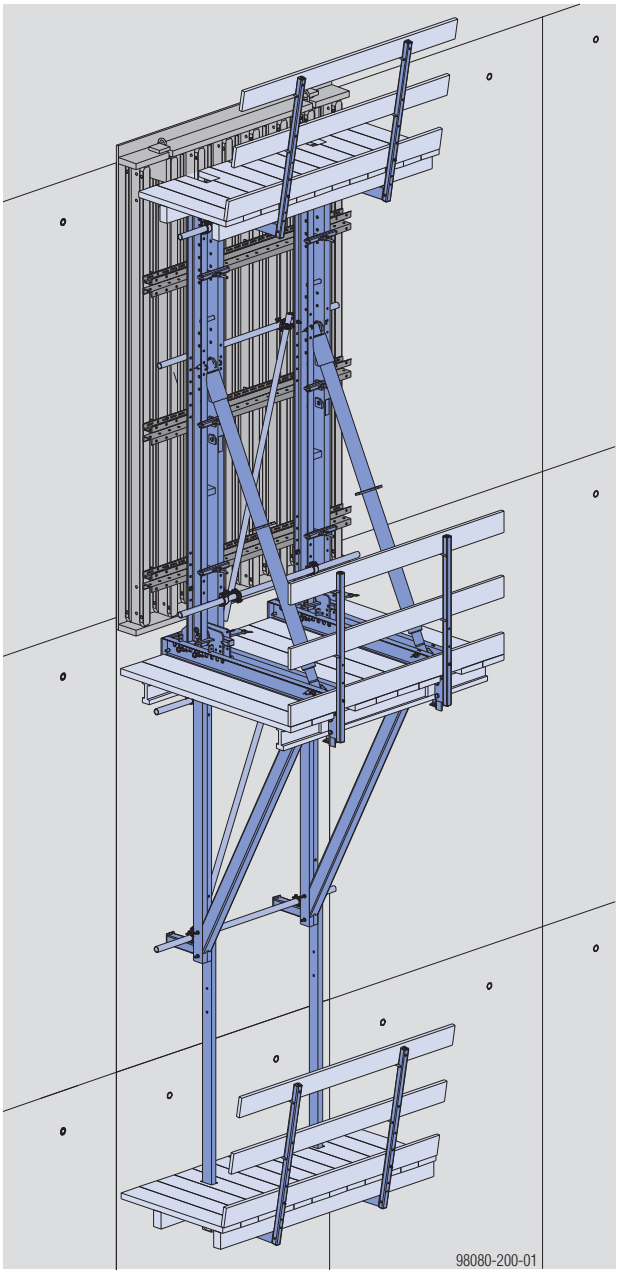
Dam formwork D22

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.

Note:
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: 220 kN
- block heights of up to 4.0 m
- formwork is tiltable or retractable
- 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 D22 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.

- 1.9 m platform width
- formwork is tiltable

Dam formwork D22 F

The formwork can be retracted. This makes it easier to clean and maintain the form-facing, to attach fittings and to place reinforcements. The extra-wide platform gives the crew plenty of room to move.

- 2.4 m platform width
- The retractable formwork makes it possible to
  - clean the formwork even where there is densely placed reinforcement
  - carry out reinforcement work while protected by the formwork
  - mount and strip out latch-boxes

The version assembled from individual parts has special advantages whenever the 1st casting section is low in height.

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 D15

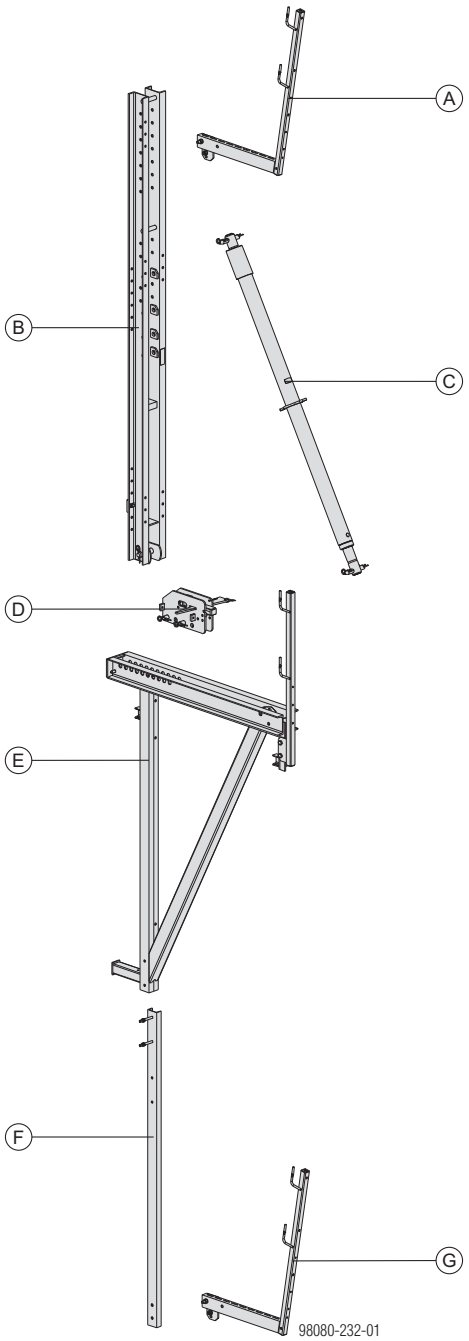
- anchor tensile force: 150 kN
- block heights of up to 3.0 m
- formwork is tiltable, and can also be modified to make it retractable

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 D22 K



A	Screw-on access bracket MF75 or the platform system of the formwork being used
B	Vertical waling D22 3.00m U160 or Vertical waling D22 4.00m U160
C	Spindle strut D22 3.00m or Spindle strut D22 4.00m
D	Swivel bearing plate D22 or Swivel bearing plate D22 S
E	Cantilever bracket D22 K
F	Suspension profile D15/D2
G	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 D22**
  3.00m U160 or **4.00m U160 (B)**
  The vertical waling is for holding and adjusting the formwork element, and for transferring the concrete forces into the cantilever bracket.
- **Spindle strut D22 3.00m** or **4.00m (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 D22** or **D22 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.
  - **D22**: for use with timber-beam and framed formwork systems
  - **D22 S**: for use with framed and steel formwork systems

Working platform

The **Cantilever bracket D22 K (E)** is used for constructing the main working platform, and carries the formwork element or panel.

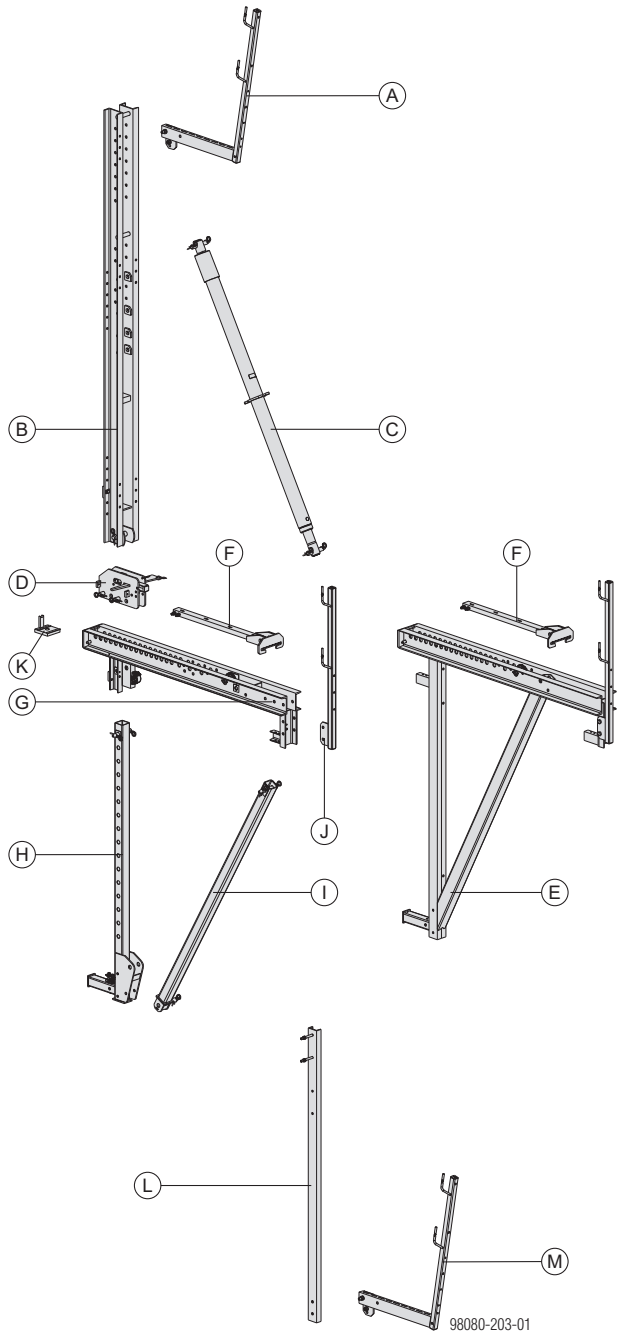
The pressure of the fresh concrete is transferred by way of the suspension point and the pressure-brace.

Suspended platform

Consisting of:

- **Suspension profile D15/D22 (F)**
- **Screw-on access bracket MF75 (G)**

System overview D22 F



A	Screw-on access bracket MF75 or the platform system of the formwork being used
B	Vertical waling D22 3.00m U160 or Vertical waling D22 4.00m U160
C	Spindle strut D22 3.00m or Spindle strut D22 4.00m
D	Swivel bearing plate D22 or Swivel bearing plate D22 S
E	Cantilever bracket D22 F
F	Travelling profile D22
G	Horizontal profile D22 F
H	Vertical profile D22 F
I	Pressure strut D22 F
J	Handrail post for cantilever bracket
K	Locking plate D22 F
L	Suspension profile D15/D22
M	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 D22 3.00m U160** or **4.00m U160 (B)**
  The vertical waling is for holding and adjusting the formwork element, and for transferring the concrete forces into the cantilever bracket.
- **Spindle strut D22 3.00m** or **4.00m (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 D22** or **D22 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.
  - **D22**: for use with timber-beam and framed formwork systems
  - **D22 S**: for use with framed and steel formwork systems

Working platform

The **Cantilever bracket D22 F (E)** with Travelling profile D22 **(F)** 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.

It is also possible to assemble Cantilever bracket D22 F from individual parts, using **Horizontal profile D22 (G)** F, **Vertical profile D22 F (H)** , **Pressure strut D22 F (I)** and **Handrail post for cantilever bracket (J)** .

Suspended platform

Consisting of:

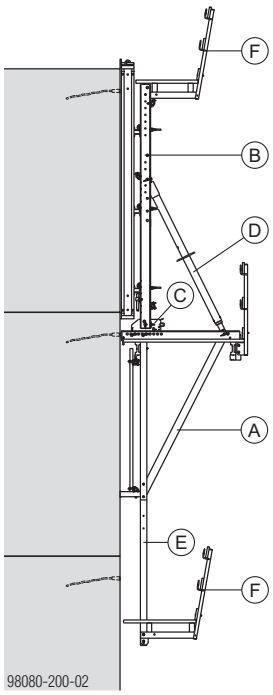
- **Suspension profile D15/D22 (L)**
- **Screw-on access bracket MF75 (M)**

Areas of use

The flexibility of Doka dam formwork D22 gives it a very wide spectrum of use. Very many different combinations of wall sequences are possible.

Dam formwork D22 K

Straight walls

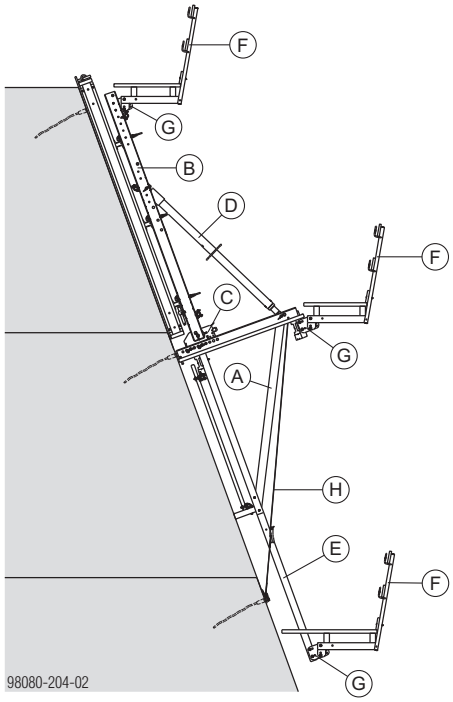


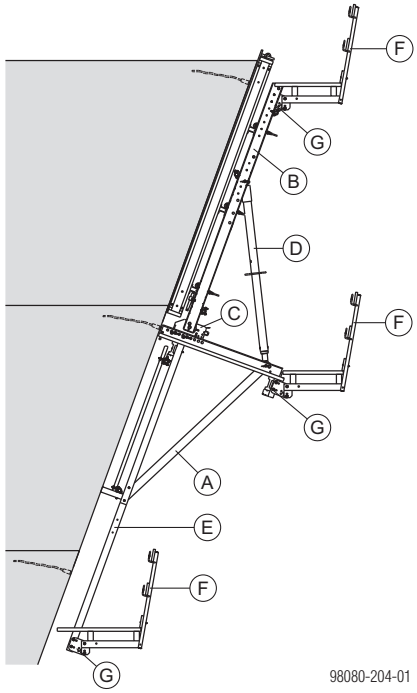
A	Cantilever bracket D22 K:
B	Vertical waling D22
C	Swivel bearing plate D22
D	Spindle strut D22
E	Suspension profile D15/D22
F	Screw-on access bracket MF75
G	Swivel plate MF
H	Tension-rod brace (a project-specific check must be made to determine whether this is needed)

Inclined wall

Note:

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



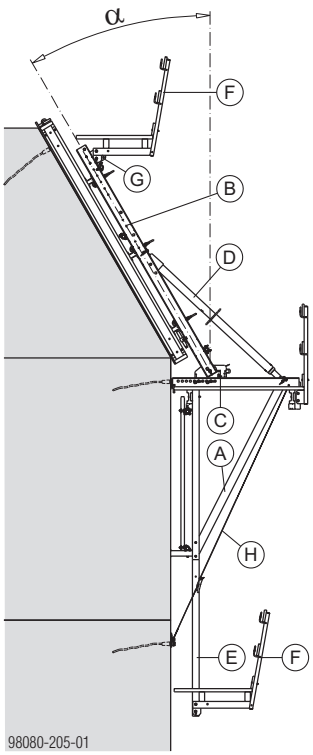


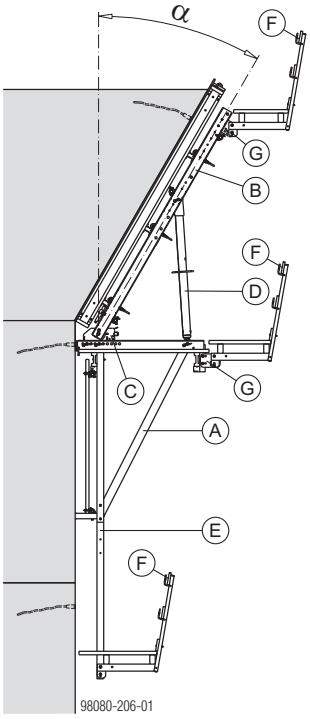
Kink in wall

NOTICE

- 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.

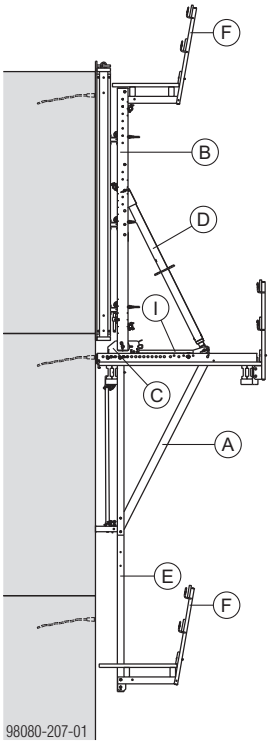




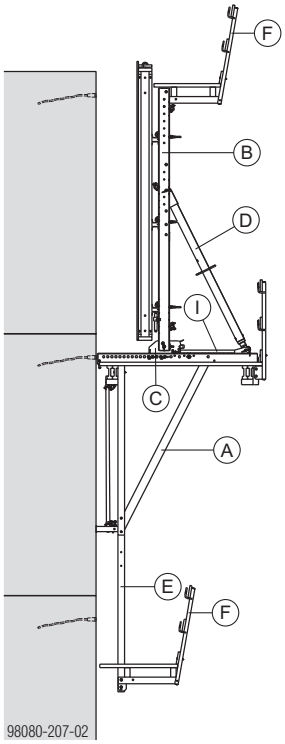
Dam formwork D22 F

Straight walls

Formwork closed:



Retracted:



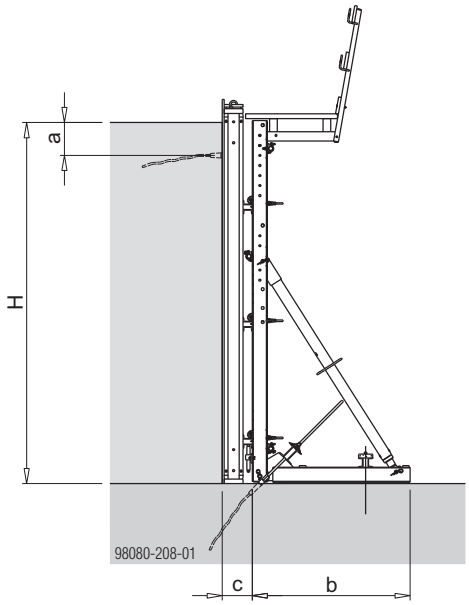
A	Cantilever bracket D22 F
B	Vertical waling D22
C	Swivel bearing plate D22
D	Spindle strut D22
E	Suspension profile D15/D22
F	Screw-on access bracket MF75
I	Travelling profile D22

NOTICE

- If it is intended to use a retractable formwork unit on inclined walls, this must be reviewed separately.

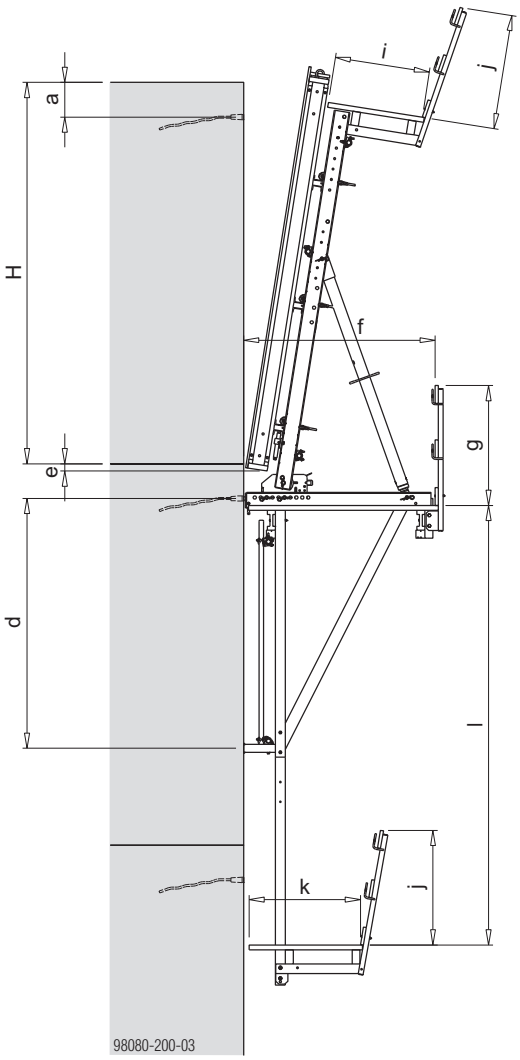
System dimensions

Starter-block formwork



Dam formwork D22 K

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



System dimensions [mm]

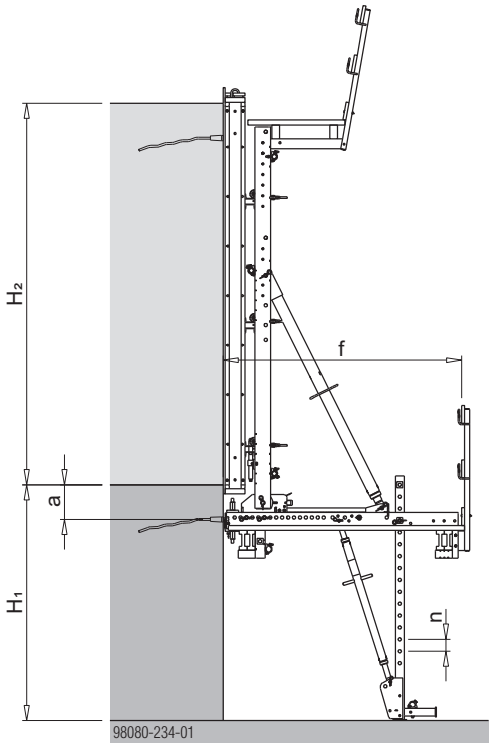
		Type of bracket	
		D22 K	D22 F
H	Block height	3000 - 4000	
a	Distance between top of concrete and anchoring point	350	
b	Width of Starter-block unit + Vertical waling	1680	
c	Overall height of formwork	321 [1] / 223 [2]	
d	Distance between suspension point and pressure strut	2520	
e	Formwork overlap	100	
f	Width of bracket	1900	2400
g	Height of railings on bracket	1210	
i	Width of pouring platform	960	
j	Height of railings on pouring platform or suspended platform	1150	
k	Width of suspended platform	1130	
l	Distance between bracket and suspended platform	either 3950 or 4450	
m	Distance between formwork and concrete	---	max. 600[1] / 700[2]
n	Height adjustment	---	120[3]
H_1	Starter-block height	---	950 - 2750[3]

[1] with Large-area formwork Top 50
[2] with Framed formwork Framax Xlife
[3] Cantilever bracket D22 F from individual parts

Dam formwork D22 F

2nd casting section - working platform propped on the ground

The Cantilever bracket D22 from individual parts can be adapted to low starter block units and to different starter block unit heights.

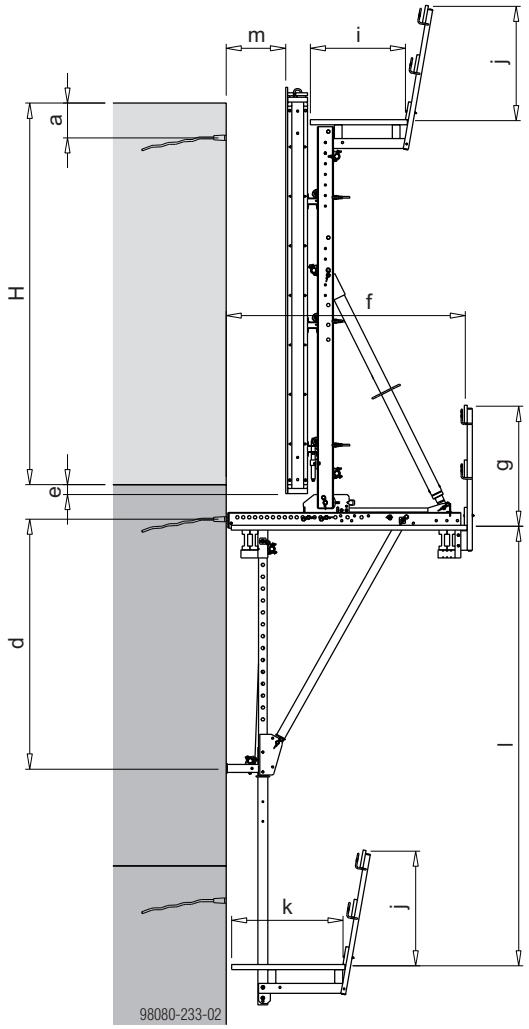


H_2 ... Permissible pouring height in the 2nd casting section

Note:
Follow the directions in the section headed 'Dimensioning for the 2nd casting section - working platform propped on the ground' for calculating permissible pouring height H_2.

Typical zone

When used with the Cantilever bracket D22 F and the Travelling profile D22, the formwork is retractable, i.e. can be rolled back.

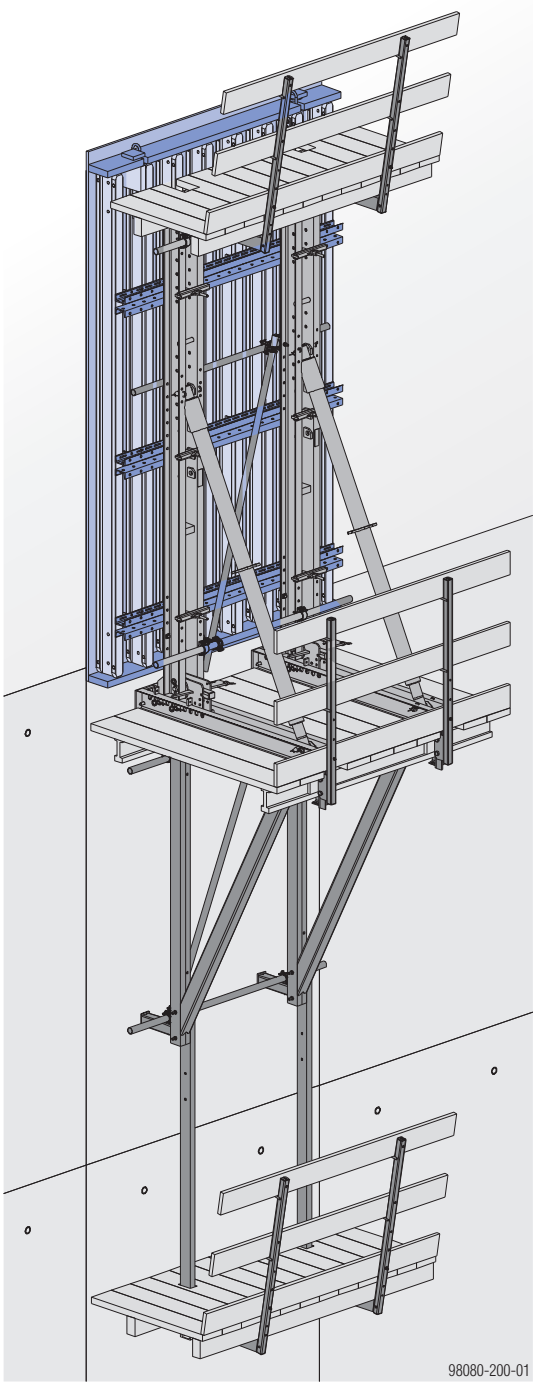


Note:
The system dimensions apply for both versions of Cantilever bracket D22 F.

Possible formwork systems

Timber-beam formwork

e.g. Large-area formwork Top 50



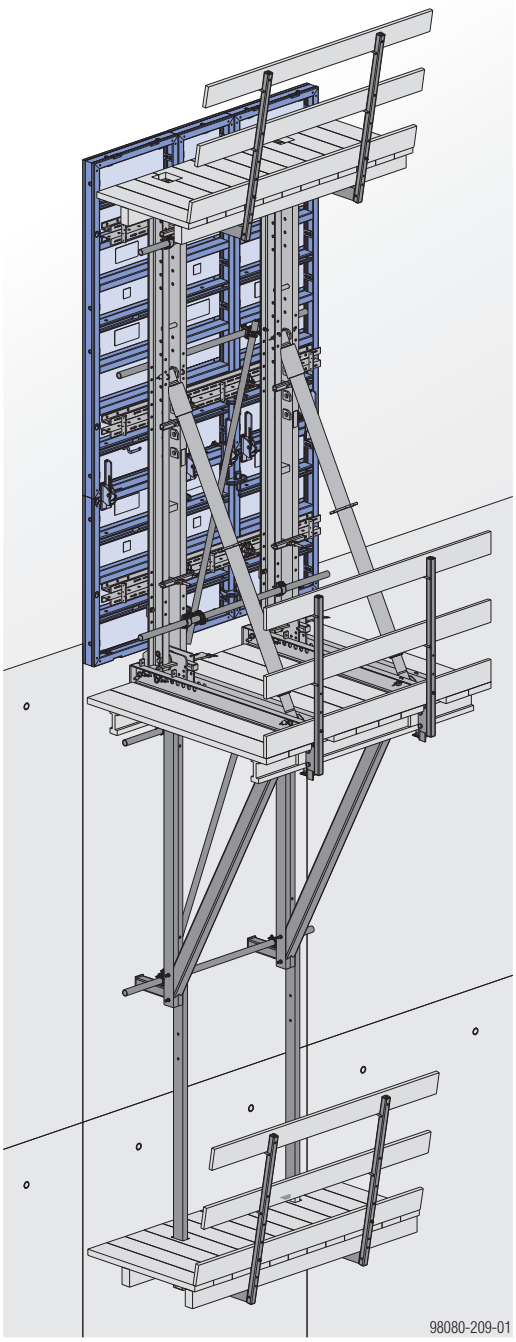
For more information, see the 'Large-area formwork Top 50' User Information booklet.

Steel formwork

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

Framed formwork

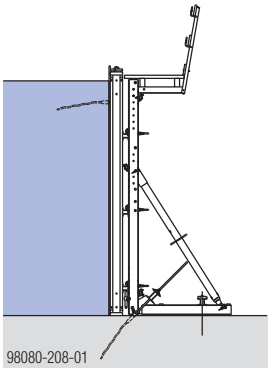
e.g. Framed formwork Framax Xlife



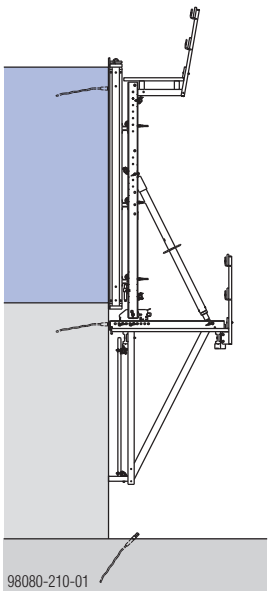
For more information, see the 'Doka framed formwork Framax Xlife' User Information booklet.

Schematic workflow of climbing phases

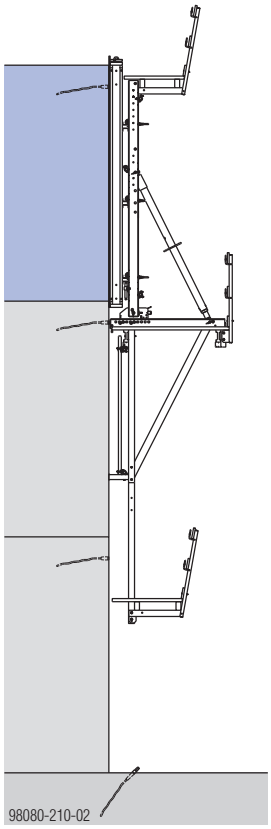
Start-up phases



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

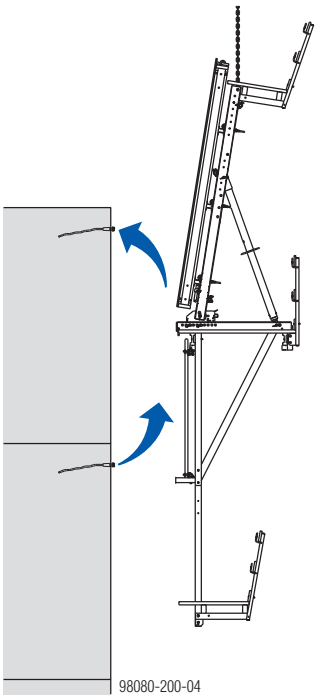


The 2nd casting section (and all further sections) are poured using the climbing scaffold.

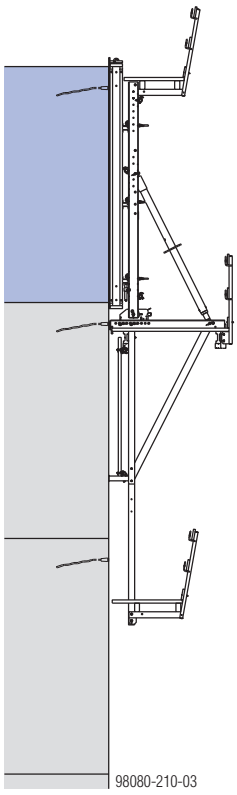


The suspended platforms are mounted, and then the 3rd section is poured.

Typical phases



The climbing scaffold is raised to the next casting section.

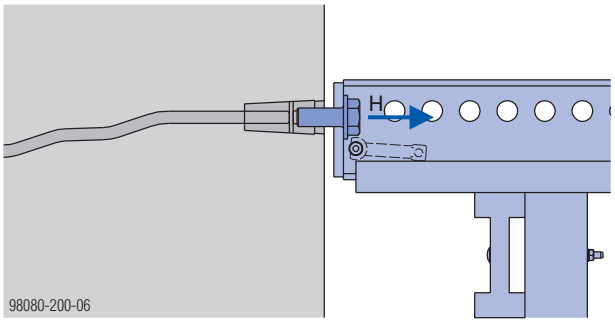


The next casting section is poured.

Structural design

Loading data

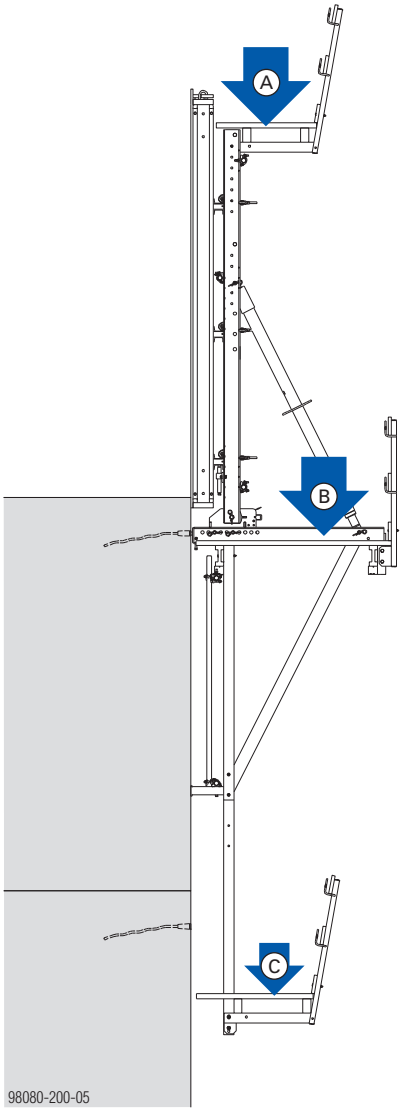
Imposed loads



H ... permitted horizontal load: 220 kN

Note:
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:

- Fresh-concrete pressure
- Block height
- Angle of inclination of formwork
- Wind load

Note:
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 multi-purpose walings must be selected).

Max. live load of the working platform: 1,5 kN/m² (incl. loads occurring in the course 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'.

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

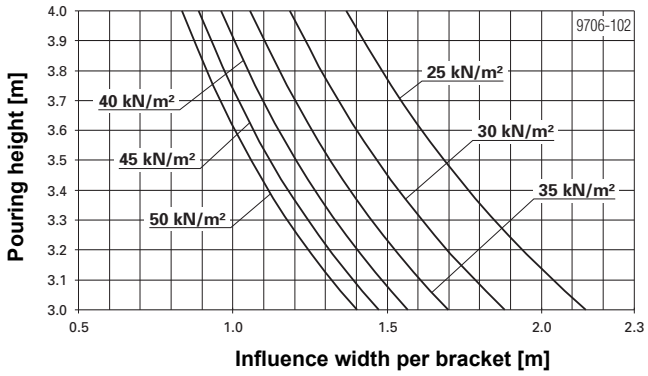
The Cantilever bracket, Vertical waling and Spindle strut must be reviewed separately for each project.

Note:
The relevant diagram should be used, for the safety factor required by national regulations.

Dimensioning with anchor tensile force of 220 kN

Anchor tensile force: 220 kN

- **Tie-rod system 20.0:**
  1.6 : 1 factor of safety against steel failure
- **Tie-rod system 26.5:**
  2.5 : 1 factor of safety against steel failure

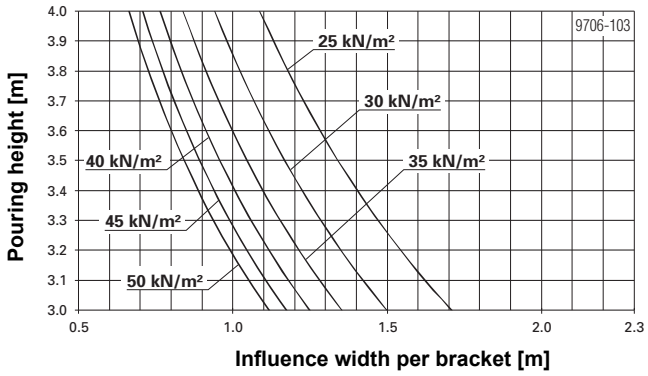


The values in the diagram apply for a distance of 350 mm between the top of the concrete and the anchoring point.

Dimensioning with anchor tensile force of 173 kN

Anchor tensile force: 173 kN

- **Tie-rod system 20.0:**
  2 : 1 factor of safety against steel failure
- **Tie-rod system 26.5:**
  3.2 : 1 factor of safety against steel failure

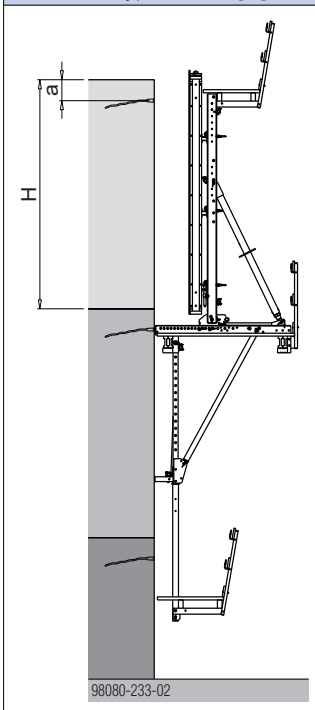
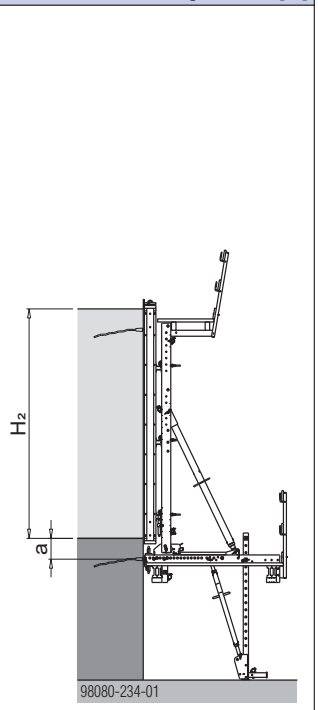


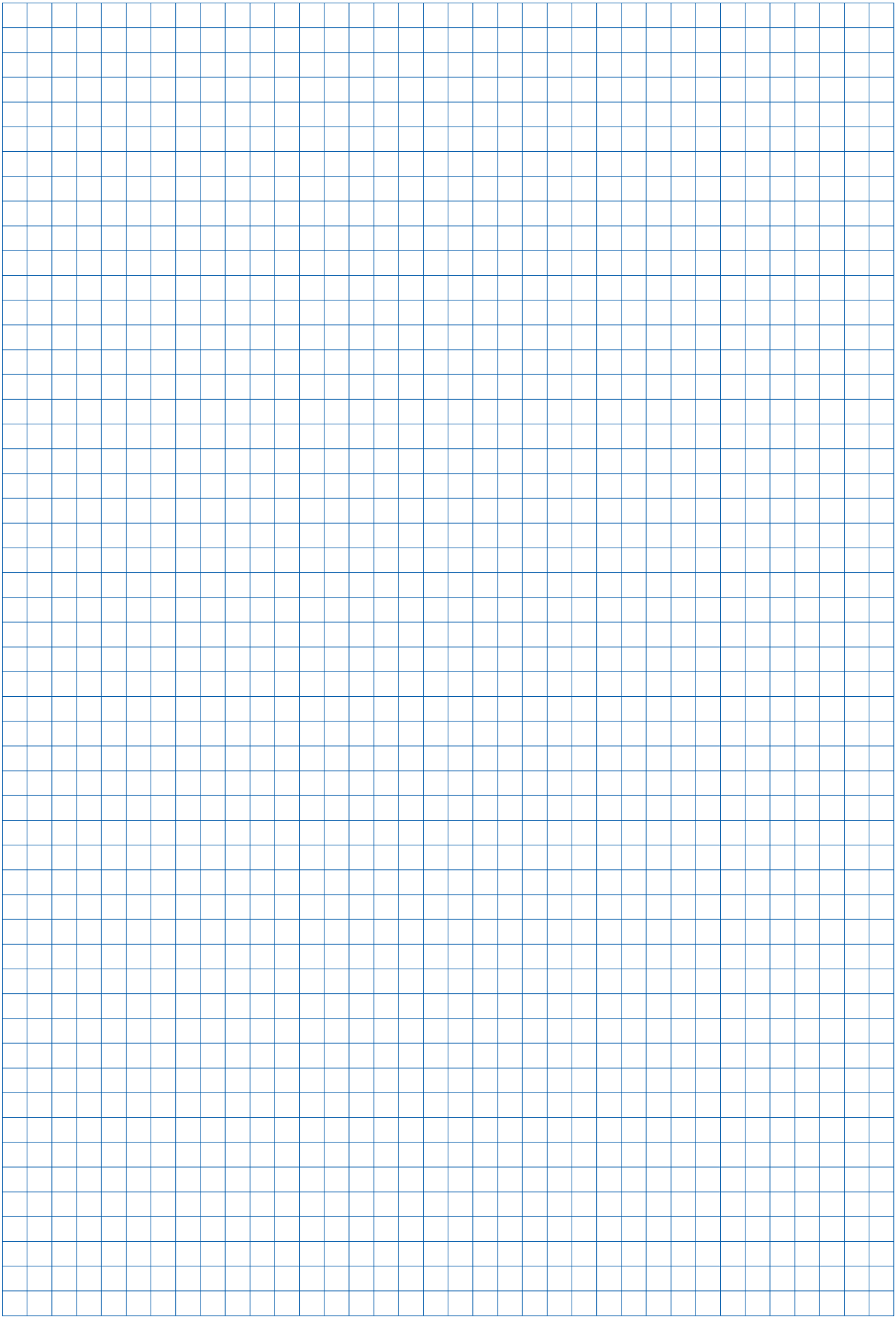
The values in the diagram apply for a distance of 350 mm between the top of the concrete and the anchoring point.

Dimensioning for the 2nd casting section - working platform propped on the ground

Note:
Pouring height and concrete pressure have to be reduced in the 2nd casting section.
Dimensioning for the typical zone is used as the basis for calculating the permissible values for the 2nd casting section

H ... Typical pouring section height	Influence width [m]	H_2 ... Permissible pouring height [m]	Permitted formwork pressure [kN/m²]
4.00 m	0.84	4.0	33
	0.89	4.0	30
	0.96	4.0	28
	1.06	4.0	25
	1.18	3.7	25
	1.37	3.5	25
	1.65	3.1	25
3.50 m	1.06	3.5	35
	1.12	3.5	32
	1.21	3.5	29
	1.32	3.5	26
	1.47	3.3	25
	1.69	3.1	25
	2.02	2.8	25
3.00 m	1.40	3.0	36
	1.47	3.0	33
	1.57	3.0	30
	1.70	3.0	27
	1.88	2.9	25
	2.14	2.7	25
	2.55	2.4	25

H ... Permissible pouring height in the typical zone [m]	H_2 ... Permissible pouring height in the second casting section [m]
	



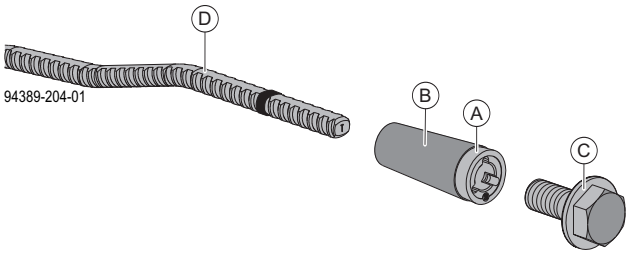
Anchoring on the structure

Positioning point and suspension point

NOTICE

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 or Universal climbing cone 2G
B Sealing sleeve K (expendable anchoring component)
C Cone screw M30 SW50 7cm
D Pigtail anchor (expendable anchoring component)

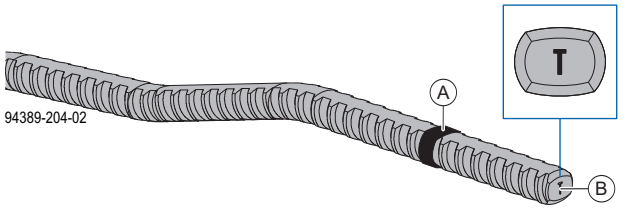
- **Universal climbing cone or Universal climbing cone 2G**
  - The positioning points and the suspension points are prepared using the Universal climbing cone 20.0.
- **Pigtail anchor**
  - Expendable anchoring component for anchoring the universal climbing cone (and thus the climbing unit) in the concrete from one side.
- **Cone screw M30 SW50 7cm**
  - Positioning point – for fastening the universal climbing cone.
  - Suspension point – safe means of suspending the climbing unit.

NOTICE

- Use only the Cone screw M30 SW50 7cm for the positioning point and suspension point (head of screw is green)!
- The use of the Cone screw B 7cm (head area marked red) is prohibited.

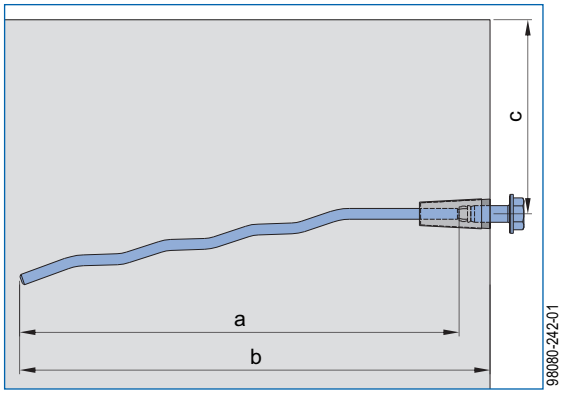
Ideally, **pigtail anchors** are used, or – depending on the characteristics of the structure – **stop anchors**.

Pigtail anchor



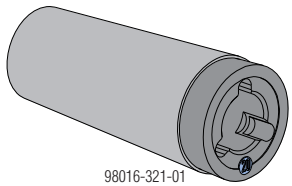
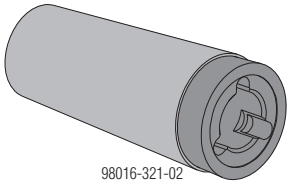
A Mark for screw-in depth
B Code for Pigtail anchor 20.0 = T
Code for Pigtail anchor 26.5 = U

A code on the pigtail anchor permits easy identification before and after pouring.



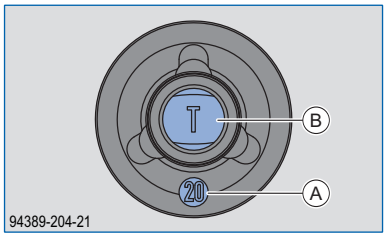
a ... 795 mm
b ... 850 mm
c ... 350 mm

Universal climbing cones 20.0

Universal climbing cone 20.0 **2G**	Universal climbing cone 20.0
	
98016-321-01	98016-321-02

Advantages of the Universal climbing cone 20.0 **2G**:

- Green mark on the end face for easy identification
- Clear view of the code on the pigtail anchor in as-installed condition

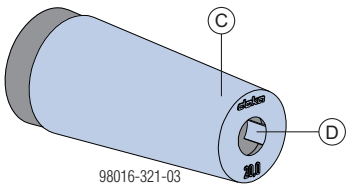


A Green mark on end face
B Code on the pigtail anchor

Sealing sleeve K 20.0

NOTICE

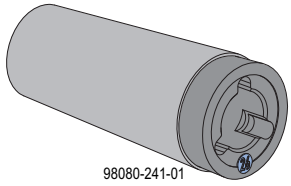
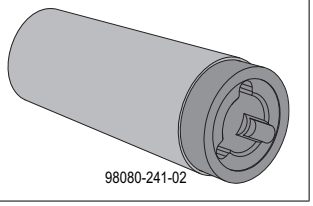
Universal climbing cones are supplied with sealing sleeves K. **Every time** the cones are **re-used**, fit them with **new sealing sleeves** first.



C Sealing sleeve K 20.0 (green)
D Tab on the sealing sleeve

The tab on the sealing sleeve sits against the thread of the universal climbing cone and prevents the stop anchor from working loose.

Universal climbing cones 26.5

Universal climbing cone 26.5 **2G**	Universal climbing cone 26.5
	
98080-241-01	98080-241-02

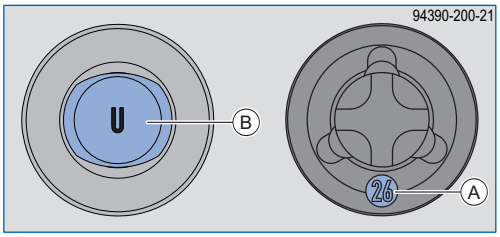
Advantages of the Universal climbing cone 26.5 **2G**:

- Blue mark on the end face for easy identification

NOTICE

Universal climbing cones 26.5 do not offer a clear view of the end face of the pigtail anchor.

➤ Remove the Universal climbing cones 26.5 for checking the positioning points.

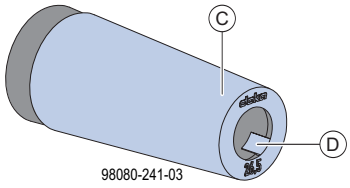


A Blue mark on end face
B Code on the pigtail anchor

Sealing sleeve K 26.5

NOTICE

Universal climbing cones are supplied with sealing sleeves K. Fit **new sealing sleeves every time the cones are re-used**.



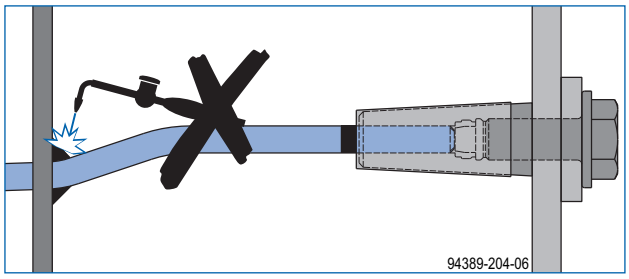
C Sealing sleeve K 26.5 (blue)
D Tab on the sealing sleeve

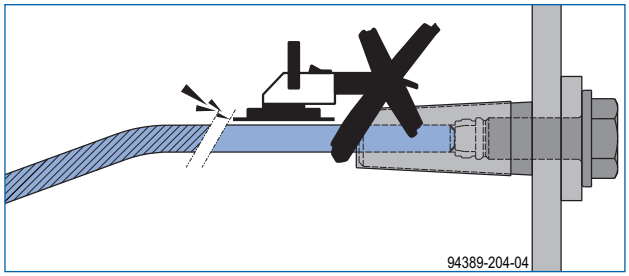
The tab on the sealing sleeve sits against the thread of the universal climbing cone and prevents the stop anchor from working loose.

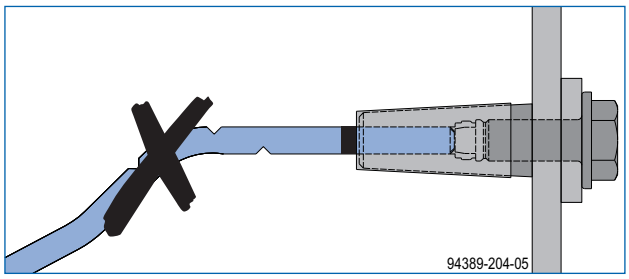
Preparing the positioning point

Note:
The following steps are illustrated here with the Tie rod system 20.0 and apply by analogy for the Tie rod system 26.5 as well.

WARNING
Sensitive anchoring, suspension and connector components!
- ➤ Never weld or heat these components.
- ➤ Any components that are damaged or weakened by corrosion or wear must be withdrawn from use.



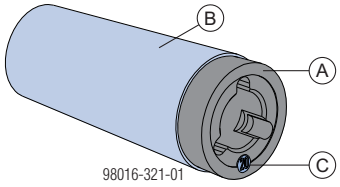




Preparing the positioning point

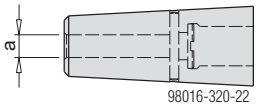
➤ Push the sealing sleeve all the way onto the universal climbing cone.

The coloured mark on the universal climbing cone and the colour of the sealing sleeve must be the same.



A	Universal climbing cone 20.0 2G
B	Sealing sleeve K 20.0 (green)
C	Green mark (only on Universal climbing cone 20.0 2G)

For Universal climbing cones 20.0 (without coloured mark), the diameter of the form-tie hole must be 20 mm.

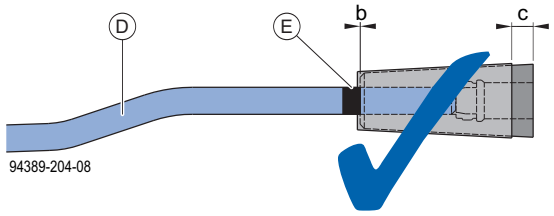


a ... diam. 20 mm

Note:
Do not screw the pigtail anchor in until the sealing sleeve is pushed fully on to the universal climbing cone.

WARNING

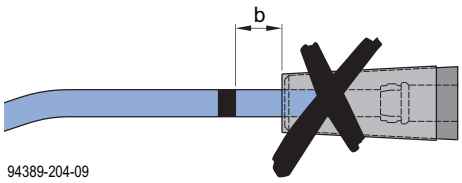
➤ Always screw the pigtail anchor into the universal climbing cone until it fully engages (up to the depth mark).
Not screwing the pigtail anchor fully into the cone may lead to reduced load-bearing capacity and failure of the suspension point – resulting in possible injury and/or damage.



b ... 0 mm
c ... 15 mm

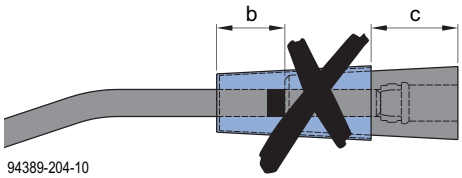
D Pigtail anchor 20.0 (lost anchoring component)
E Depth mark

- The depth mark on the pigtail anchor must be right up against the universal climbing cone = must be screwed in to the full depth.



b ... > 0 mm not permitted

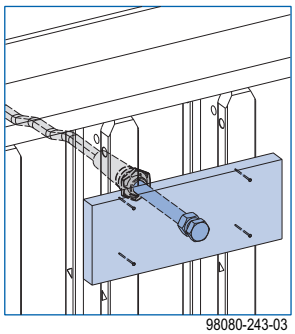
- The sealing sleeve must be completely pushed onto the universal climbing cone.



c ... > 15 mm not permitted

Positioning point with Positioning bolt M30x380 (with hole drilled through form-ply)

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.

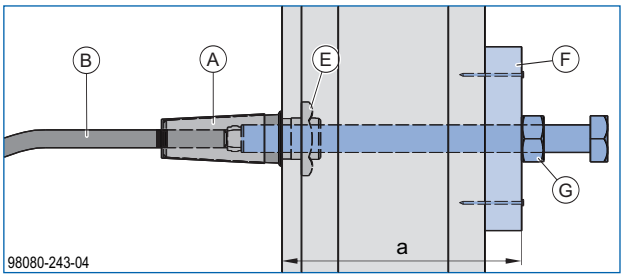


Possible thicknesses of form-ply: 18 - 27 mm

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

Installation:

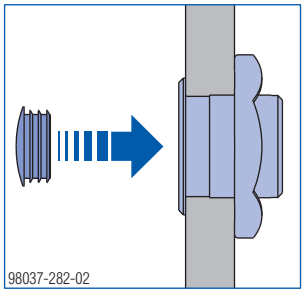
- Fix the plank to the Doka beams.
- Push the Positioning bolt M30x380 through the plank and form-ply and screw it into the universal climbing cone.
- Tighten the nut of the positioning bolt to fix the universal climbing cone into place on the form-ply.



a ... max. 310 mm

A	Universal climbing cone 20.0 2G
B	Pigtail anchor 20.0
E	Form-ply protector 32mm
F	Distribution plank
G	Positioning bolt M30x380

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

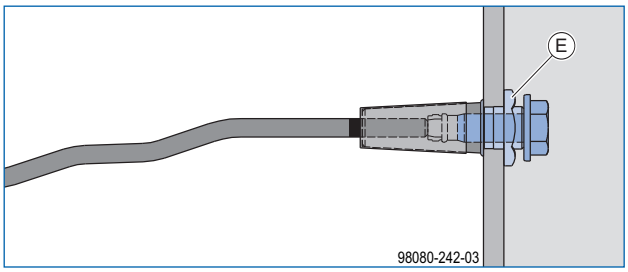


Positioning point with Cone screw M30 SW50 7cm (with hole drilled through form-ply)

NOTICE

The cone-fixing method with the Positioning screw M30 is the most suitable for the working conditions encountered on dam construction sites.

Alternatively, cone fixing can be with the Cone screw M30 SW50 7cm to the Form-ply protector 32mm or directly to the form-ply.

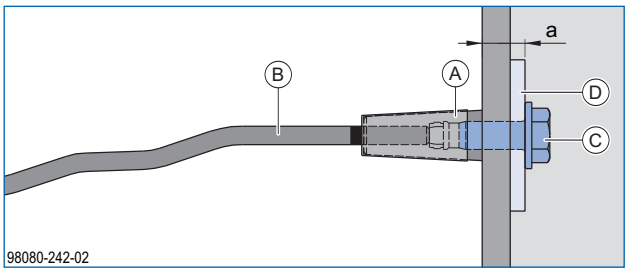


E	Form-ply protector 32mm

Installation:

- Fasten a packing plate (e.g. Dokaplex 15 mm) to the form-ply (position as shown in shop drawing / assembly drawing).
- Drill a diam. 30 mm hole in the form-ply (position as shown in shop drawing / assembly drawing).
- Secure the prepared positioning point to the form-ply with Cone screw M30 SW50 7cm.

The pigtail anchor must be facing downwards.



a ... 35 - 45 mm

A	Universal climbing cone 20.0 2G
B	Pigtail anchor 20.0
C	Cone screw M30 SW50 7cm
D	Packing plate

NOTICE

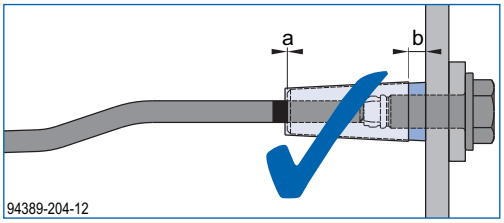
If the large size of the drilled hole makes it impracticable to use the Cone screw M30 SW50 7cm for the positioning point, (e.g. if the suspension points are often not in the same position as in the previous casting section), then the **Positioning clamp M30** must be used (**hole diam. = 9 mm**).

It is forbidden to use the Positioning disc M30 to prepare a positioning point.

Check of the positioning point

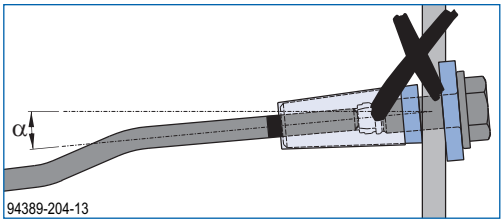
➤ Before pouring, check all positioning points and suspension points again.

- The sealing sleeve must be completely pushed onto the universal climbing cone.
- The depth mark on the pigtail anchor must be right up against the universal climbing cone = must be screwed in to the full depth.
- Tolerance for locating the positioning points and suspension points: ±5 mm in the horizontal and the vertical.



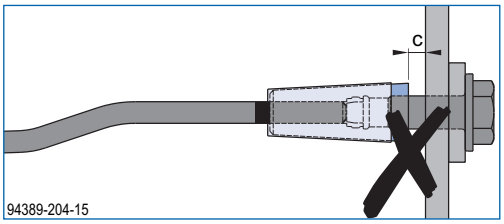
a ... 0 mm
b ... 15 mm

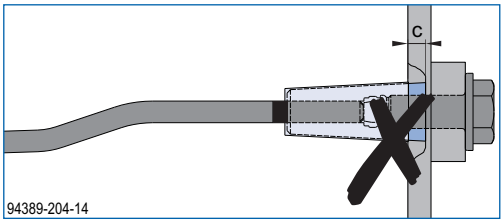
- The axis of the universal climbing cone must be at right-angles to the surface of the concrete – maximum angle of deviation: 2°.



α ... max. 2°

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





c ... > 0 mm not permitted

Pouring

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

➤ Prevent the vibrator from touching the pigtail anchors.

➤ Avoid touching the formwork with vibrators so that vibrations cannot be transmitted through the formwork to the suspension point.

➤ Do not place concrete directly above the pigtail anchors.

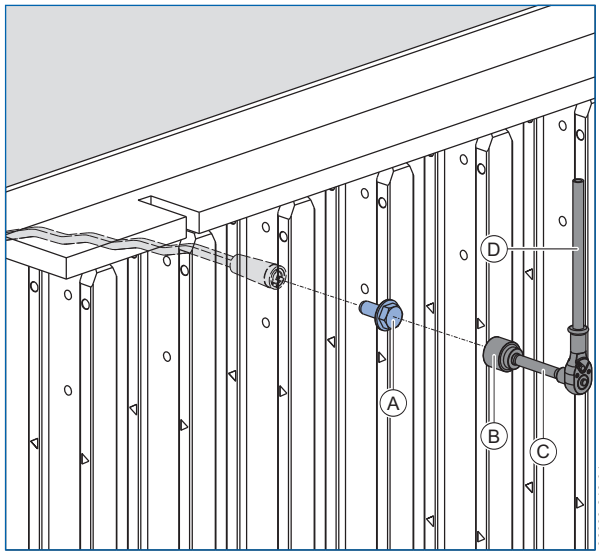
These measures prevent the anchors from working loose during pouring and vibration.

Stripping the formwork

Remove the connecting parts holding the positioning point to the formwork before stripping.

Positioning point with Cone screw M30 SW50 7cm:

➤ Cone screw M30 SW50 7cm: remove before stripping.



A	Cone screw M30 SW50 7cm
B	Box nut 50 3/4"
C	Extension 20cm 3/4"
D	Reversible ratchet 3/4"

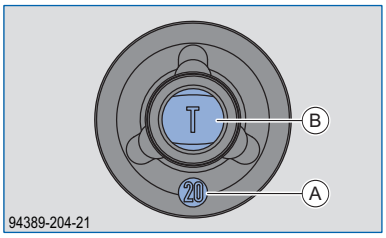
Preparing the suspension point

Check of the suspension point

NOTICE

➤ Pigtail anchor type and climbing cone must be as specified in the assembly drawing or shop drawing, as applicable.

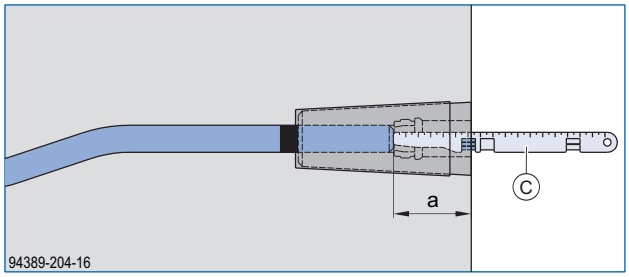
➤ Check the coloured mark on the universal climbing cone and the code on the pigtail anchor.



A Green mark on end face
B Code on the pigtail anchor

➤ Check the placement depth of the pigtail anchor.

The Safety Ruler SK permits a quick check to ensure that placement depth is within the permissible range.



a ... perm. placement depth: 55 - 65 mm

C Safety Ruler SK

Check of the positioning point with Universal climbing cone 20.0 (no coloured mark)

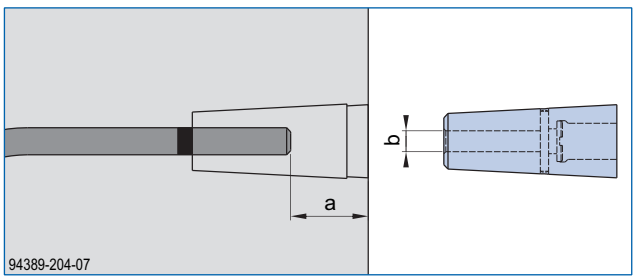
NOTICE

➤ Remove Universal climbing cone 20.0 (no coloured mark) to permit checking.

➤ Check the diameter of the form-tie hole.

➤ Check the code on the pigtail anchor.

➤ Check the placement depth of the pigtail anchor.



a ... perm. placement depth: 55 - 65 mm
b ... diam. 20 mm

➤ Fully screw Universal climbing cone 20.0 back on to the pigtail anchor.

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', and/or ask your Doka technician!

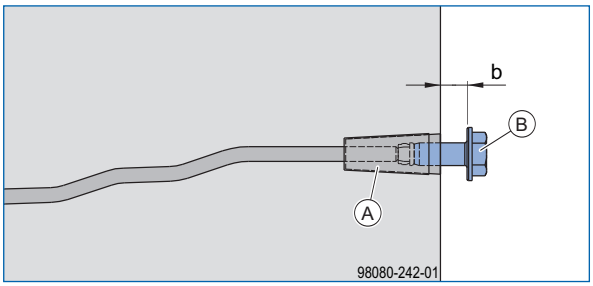
Suspending and securing the cantilever bracket

WARNING

➤ Use only the Cone screw M30 SW50 7cm for the positioning point and suspension point (head of screw is **green**)!

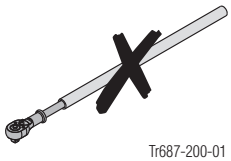
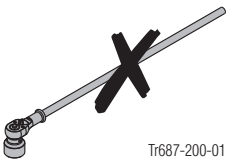
➤ Screw the Cone screw M30 SW50 B 7cm into the universal climbing cone until it engages, and tighten it firmly.
A tightening torque of 100 Nm (20 kg, assuming a ratchet-length of approx. 50 cm) is sufficient.

Ensure that control dimension b = 28 - 32 mm!



A Universal climbing cone 20.0 2G
B Cone screw M30 SW50 7cm

The Reversible ratchet 3/4" must be used for screwing in and fixing the Cone screw M30 SW50 7cm into the universal climbing cone.

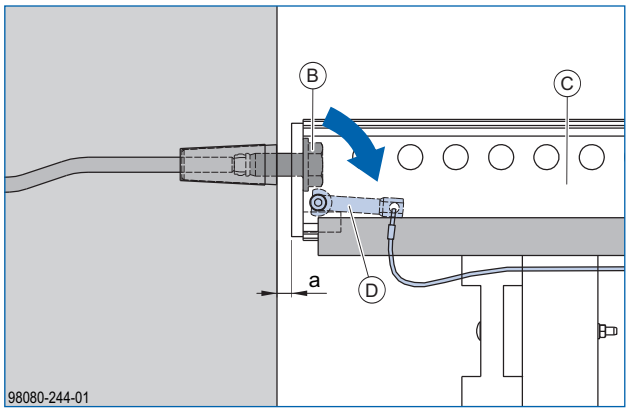
Reversible ratchet 3/4"	Reversible ratchet 3/4" with extension	Ratchet MF 3/4" SW50
 Tr687-200-01	 Tr687-200-01	 Tr687-200-01

➤ Suspend the Cantilever bracket from the Cone screw M30 SW50 7cm of the finished suspension point.

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

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

The fastening pin must be in the horizontal!



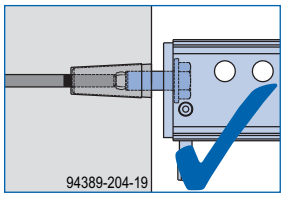
a ... play: approx. 15 mm

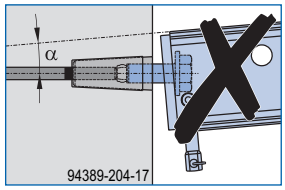
B Cone screw M30 SW50 7cm
C Cantilever bracket D22
D Fastening pin

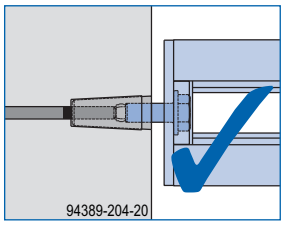
WARNING

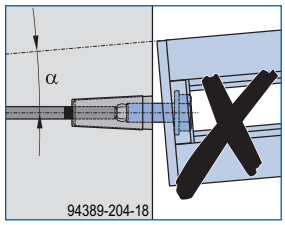
An angle of deviation >2° can cause the suspension point to fail, leading to injury and damage.

➤ The axis of the cantilever bracket must be parallel with the axis of the universal climbing cone - maximum angle of deviation 2°.



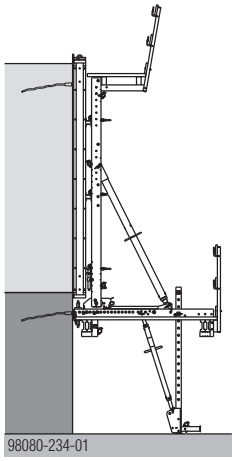






α ... max. 2°

Additional measure in the 2nd casting section - working platform propped on the ground



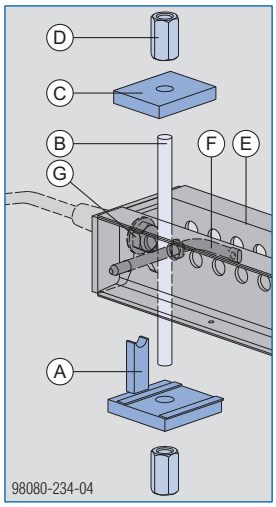
CAUTION

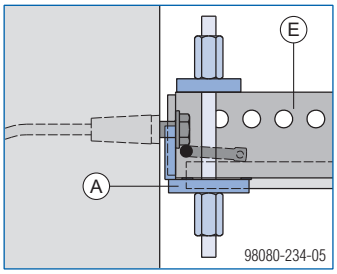
Risk of lift-out when working platforms are propped on the ground.

Securing by means of the fastening pin is not sufficient for the forces that occur during pouring!

➤ Additionally secure the working platform with Locking plate D22 F.

➤ Install Locking plate D22 F.

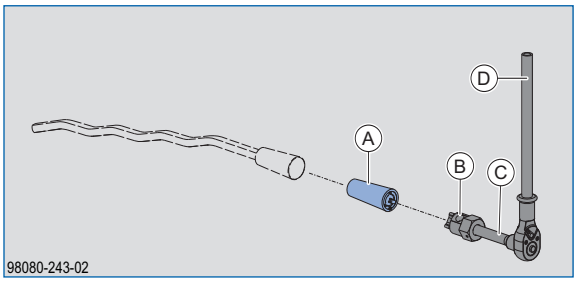




A	Locking plate D22 F
B	Tie rod 26.5
C	Anchor plate 26.5
D	Hexagon nut 26.5
E	Horizontal profile D22 F
F	Fastening pin
G	Cone screw M30 SW50 7cm

Dismounting the suspension point

➤ Remove the Cone screw M30 SW50 7cm.
➤ Remove the universal climbing cone.



A Universal climbing cone 20.0 2G
B Universal cone spanner 15.0/20.0
C Extension 20cm 3/4"
D Reversible ratchet 3/4"

Sealing the suspension point

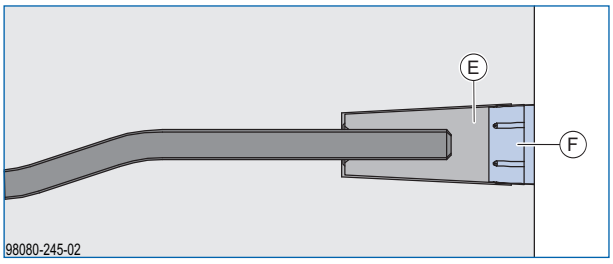
Grout level with the rest of the surface

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

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

Fair-faced concrete plug 52mm plastic

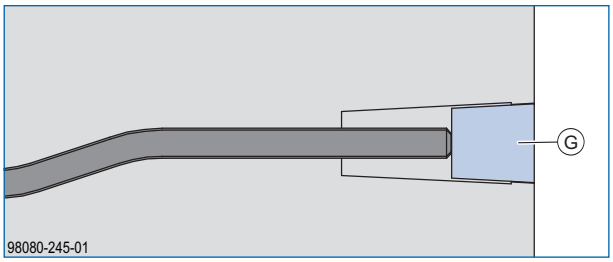
➤ Push the fair-faced concrete plug into the hole of the suspension point.



E Sealing sleeve K
F Fair-faced concrete plug 52mm plastic

Concrete cone 52mm

➤ Remove the sealing sleeve.
➤ Glue the concrete cone into the hole of the suspension point.



G Concrete cone 52mm

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

Adaptation to structure geometry

Special structure geometries (e.g. curved structures) make it necessary for the positioning point to be at an angle to the surface of the concrete.

Positioning plates enable the positioning point to be set at an angle up to 7°.

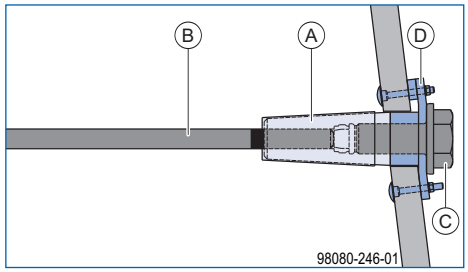
NOTICE

The axis of the universal climbing cone must be parallel with the axis of the cantilever bracket.

Note:

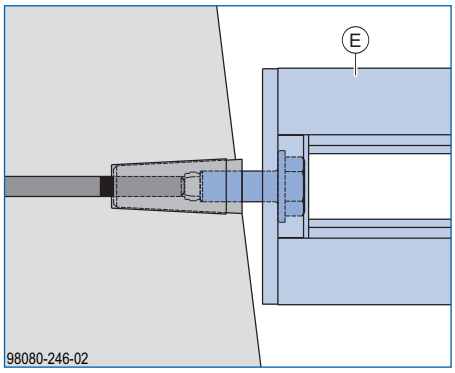
- Positioning plates are fabricated on a project-specific basis to suit the actual angle.
- Pressure bracing of the cantilever bracket against the structure additionally requires a project-dependent, wedge-shaped adapter.

Positioning point:



A Universal climbing cone 20.0 2G
B Pigtail anchor 20.0
C Cone screw M30 SW50 7cm
D Positioning plate for cone screw .,.° (project-specific)

Suspension point:



E Cantilever bracket

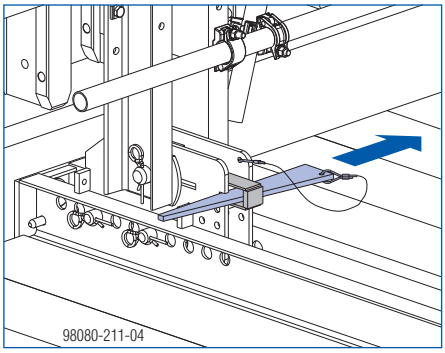
For more information, please contact your Doka technician.

Operating the formwork

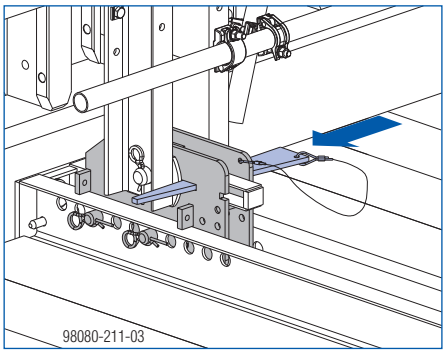
Closing the formwork

Dam formwork D22 K

➤ Remove the wedge from the release position.



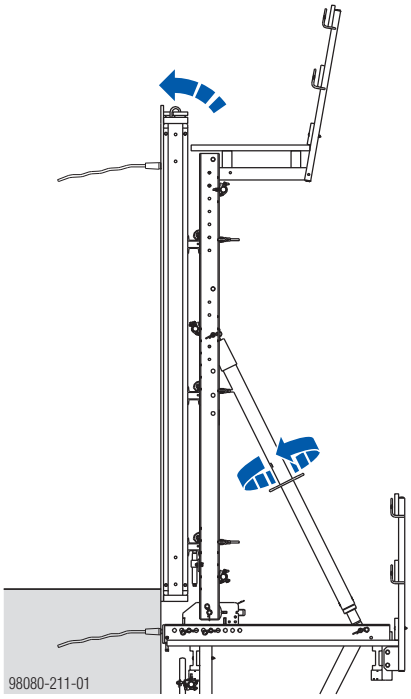
➤ Hammer the wedge into the press-tight position with a gentle blow of the hammer.



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.

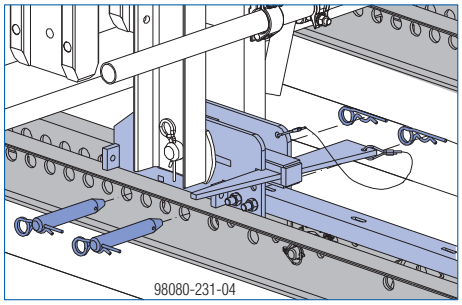


➤ Adjust the formwork and level the positioning points. See the section headed 'Plumbing and aligning the formwork'.

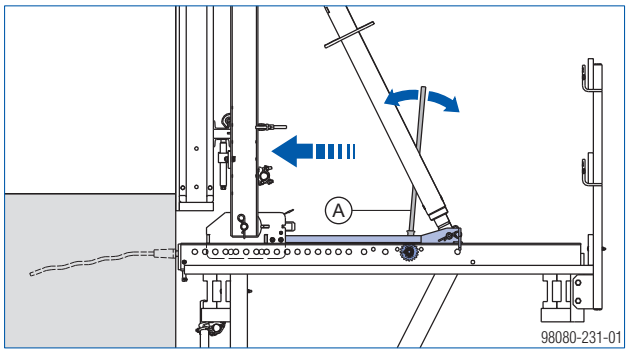
➤ After adjusting the formwork elements, hammer the wedges in once again.

Dam formwork D22 F

➤ Undo the pinned connections between the Swivel bearing plate D22 and the Cantilever bracket.

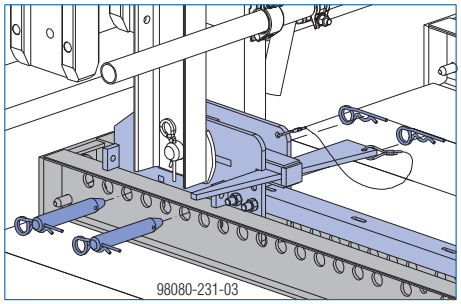


➤ Actuate both ratchets simultaneously to move the travelling units forward (together with the formwork) until they meet the top of the previously cast section.

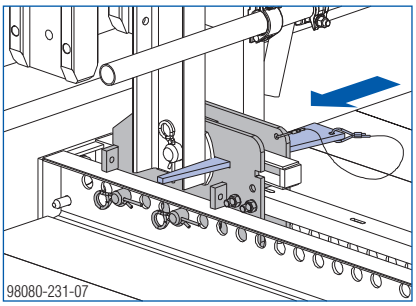


A Ratchet MF 3/4" SW50

➤ Pin the Swivel bearing plate D22 into the Cantilever bracket with both pins (position as shown in shop drawing / assembly plan).



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



➤ Fasten positioning anchors to the formwork.

➤ Adjust the formwork and level the positioning points. See the section headed 'Plumbing and aligning the formwork'.

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

Inclining the formwork forward

NOTICE

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

NOTICE

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.

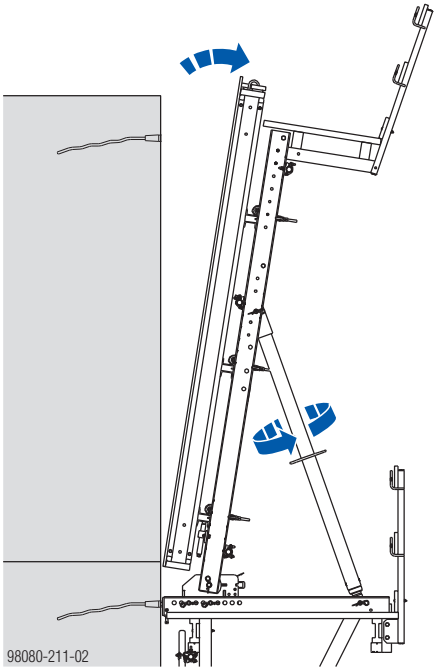
➤ Press the formwork against the concrete without using any extra tools (e.g. extra screwjack mechanisms).

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

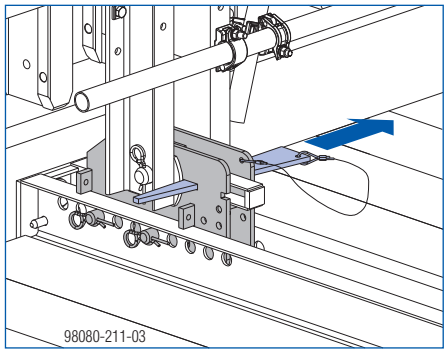
Opening the formwork

Dam formwork D22 K

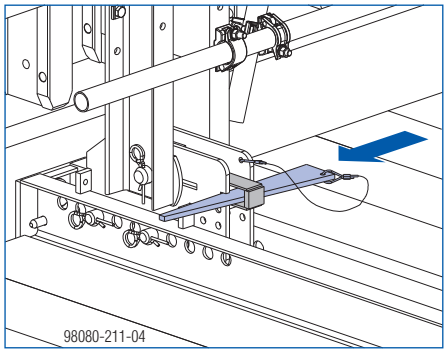
➤ Remove the Cone screw M30 SW50 7cm from the positioning point.
➤ Remove the connectors from the adjacent gang-forms.
➤ Detach the formwork panel from the concrete by turning the spindle struts, and tilt it back.



➤ Remove the wedge from the press-tight position.



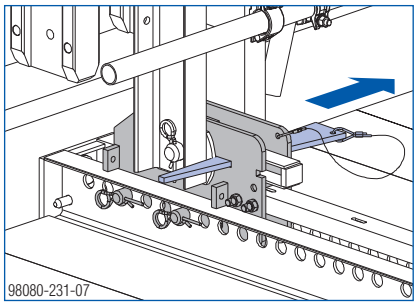
➤ Hammer in the wedge in the release position.



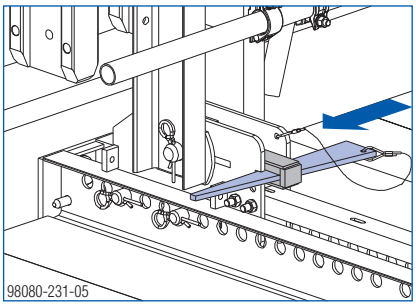
➤ Screw a Cone screw M30 SW50 7cm into the universal climbing cone. The next suspension point is now ready for use.
➤ Remove the universal climbing cone (working from the suspended platform).

Dam formwork D22 F

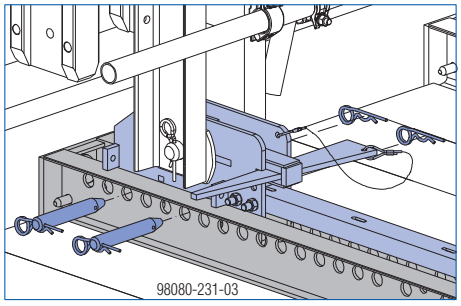
➤ Remove the Cone screw M30 SW50 7cm from the positioning point.
➤ Remove the connectors from the adjacent gang-forms.
➤ Remove the wedge from the press-tight position.



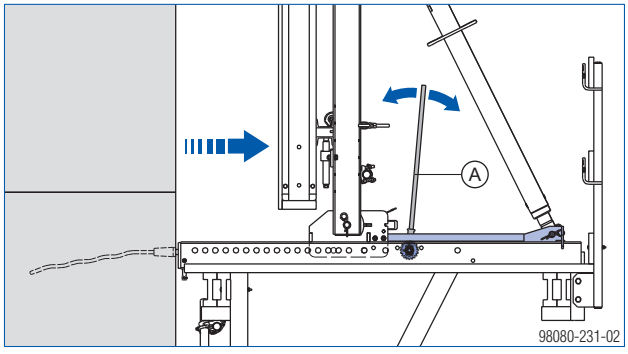
➤ Hammer in the wedge in the release position.



➤ Undo the pinned connections between the Swivel bearing plate D22 and the cantilever bracket.

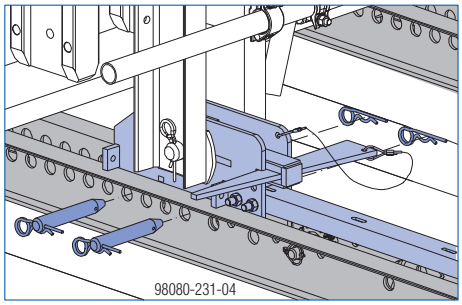


➤ Actuate both ratchets simultaneously to roll back the travelling units (together with the formwork).



A Ratchet MF 3/4" SW50

➤ Pin the Swivel bearing plate D22 into the cantilever bracket with both pins.



➤ Screw a Cone screw M30 SW50 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

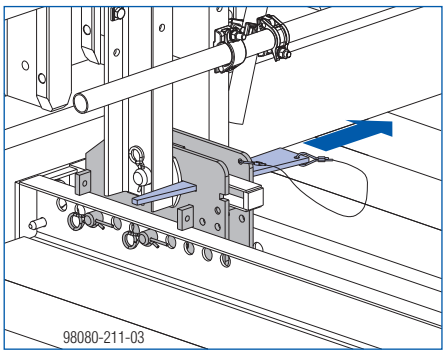
In order to permit exact adjustment of the formwork elements in relation to one another and to the structure, they are adjustable in both the vertical and the horizontal.

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)

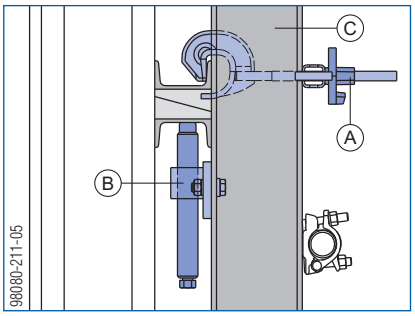
Preparing the adjusting operation

➤ Remove the wedge from the press-tight position.



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

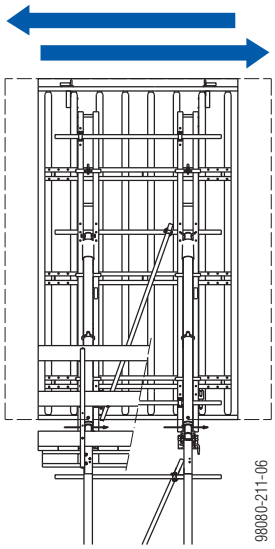
The **Adjusting spindles** permit a vertical adjustment range of approx. 150 mm. Also, the Adjusting spindles can be relocated in the hole-grid of the Vertical waling.



A	Waling-to-bracket holder
B	Adjusting spindle
C	Vertical waling D22

Length adjustment

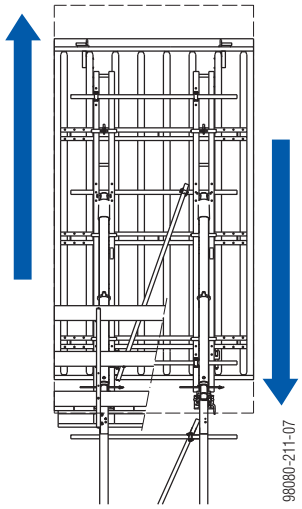
➤ Push the formwork to either side.



Height and angle adjustment

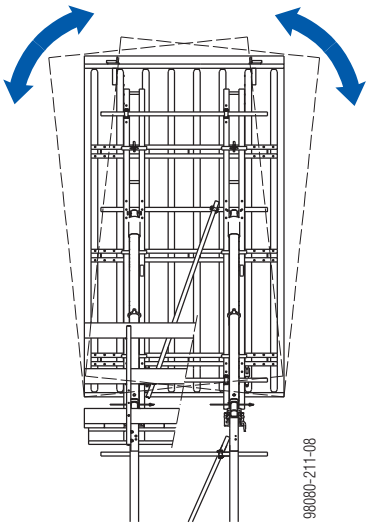
Height adjustment

➤ Turn both adjusting spindles.



Side angle adjustment

➤ Only turn one adjusting spindle.

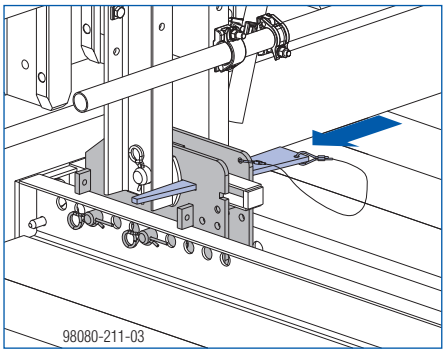


Ending the adjusting operation

➤ 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 repositioning of the complete unit

NOTICE

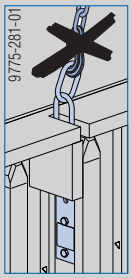
- **Before repositioning:** Remove any loose items from the formwork and platforms, or secure them firmly.
- 'Passenger transportation' is forbidden!
- Observe all regulations applying to the operation of cranes where higher wind speeds are experienced.
- Spread angle β: max. 30°
- **Brace** the vertical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

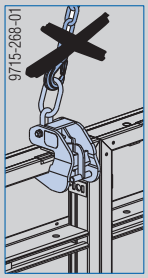
Length of chain = at least the space between the hoisting points

This automatically leads to the required spread angle β.

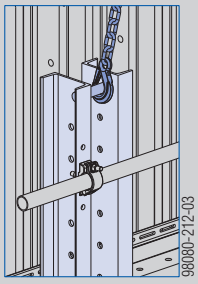
WARNING

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

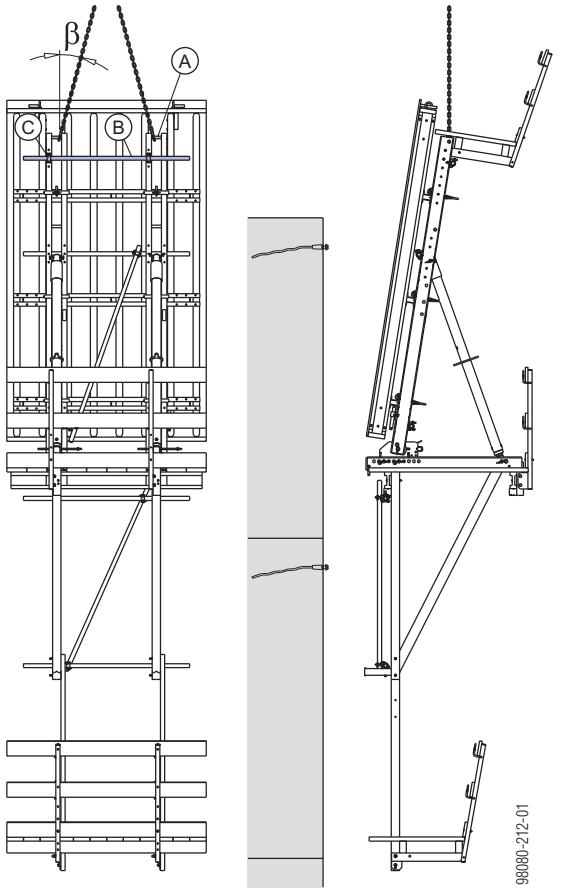




➤ Attach the crane lifting tackle to the suspension bolts of the vertical waling.



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



β ... max. 30°

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

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

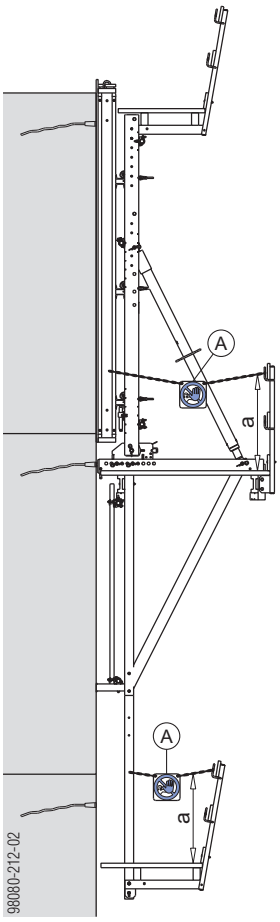
NOTICE

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

NOTICE

- When a climbing unit is 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.

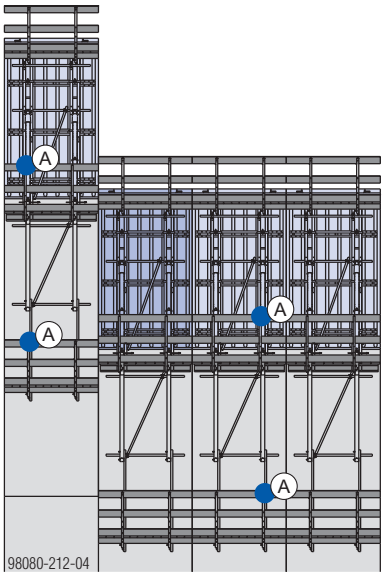
- The personnel in charge of the repositioning operation are responsible for positioning the access prohibition barriers correctly.
- During the lifting/repositioning cycle, no site personnel are allowed to be on the units to be climbed, or on adjacent units for repositioning.
- During the repositioning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



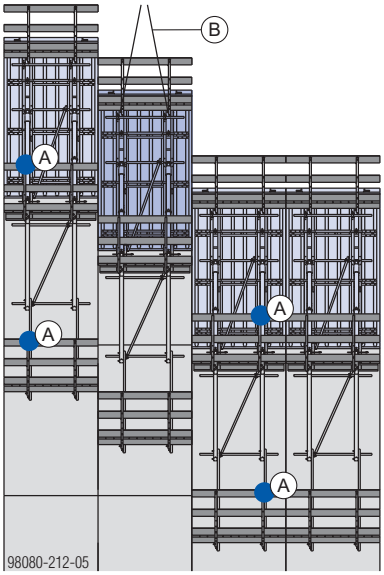
a ... 1.00 - 1.20 m

A Warning sign 'No entry' 300x300mm

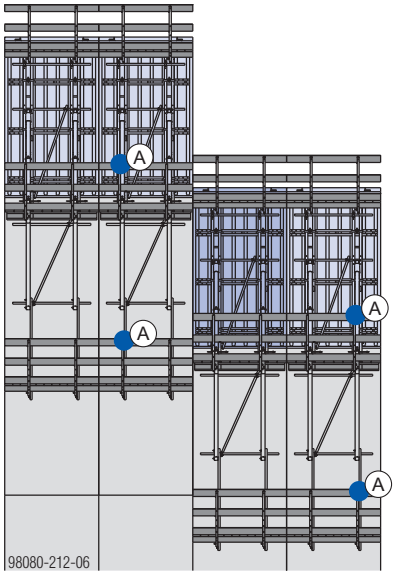
Initial situation



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



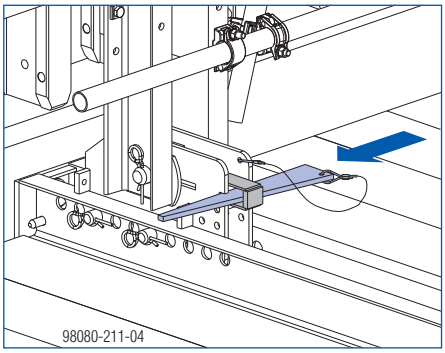
Horizontal repositioning of the prohibition barriers



A Warning sign 'No entry' 300x300mm
B Crane lifting tackle

Repositioning the entire unit

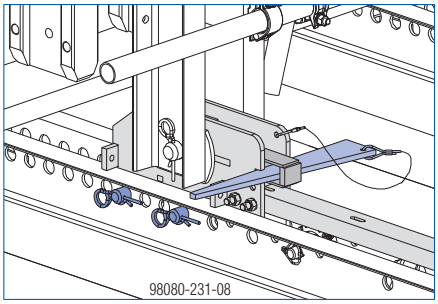
➤ Hammer in the wedge in the release position.



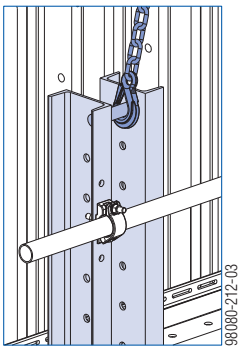
On Dam formwork D22 F:

➤ Check the Swivel bearing plate D22 before every repositioning operation.

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

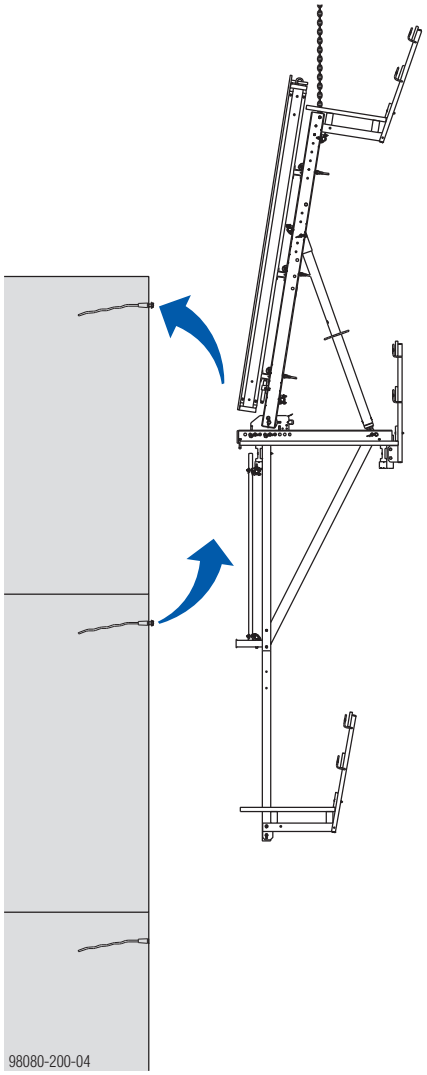


➤ Attach the lifting chain to the suspension bolts of the Vertical waling.



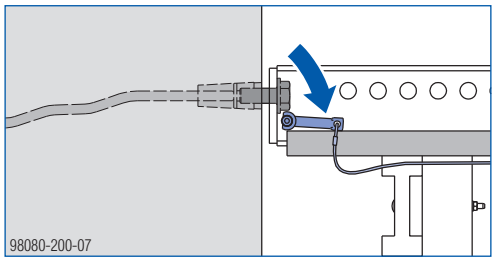
➤ Remove the fastening pins (= lift-out guard) from the suspension points.

➤ Reposition the entire unit by crane.



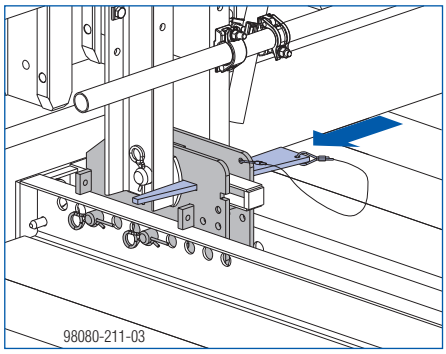
➤ Use fastening pins to secure the cantilever bracket against accidental lift-out.

The fastening pin must be in the horizontal!



➤ Detach the lifting chain from the climbing unit.

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

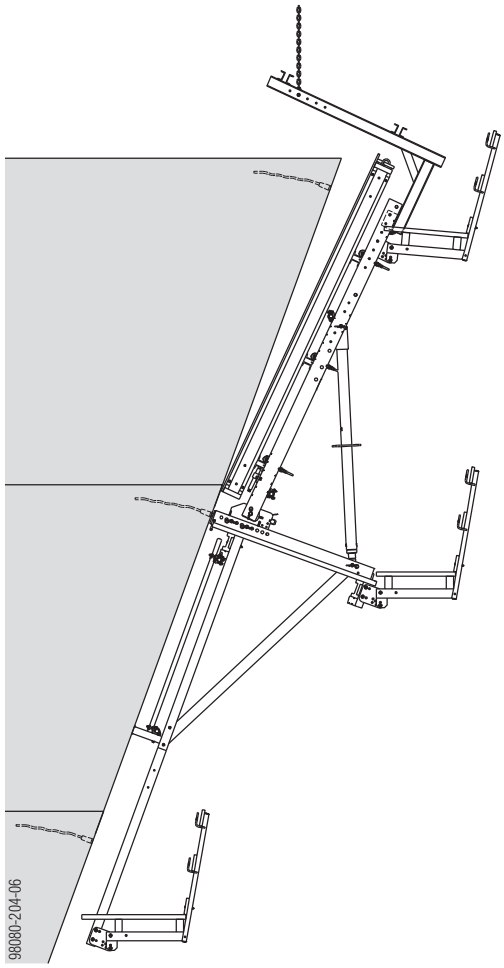


This presses the formwork element up against the previously cast section.

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.

NOTICE

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

Note:

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

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

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

WARNING

Falling hazard!

➤ Do not step onto the pouring platforms until the formwork is closed!

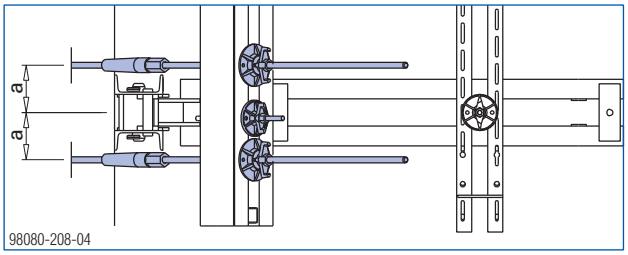
1st casting section

Anchoring in the base slab

NOTICE

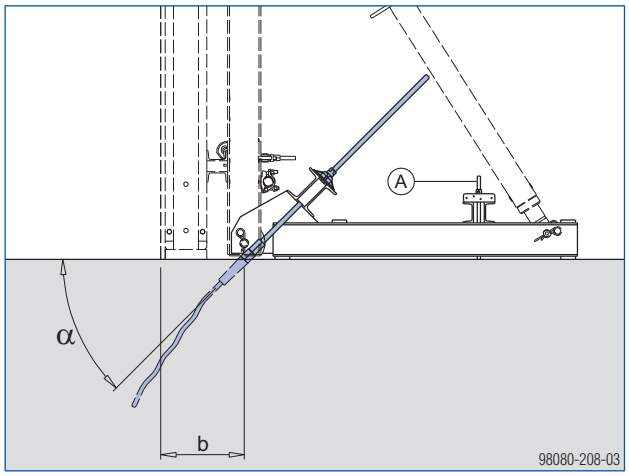
The anchoring arrangements for the starter-block formwork are always dimensioned on a project-specific basis.

For each starter-block unit, two diagonal anchors are each placed **180 mm** either side of the vertical axis of the starter-block unit.



a ... 180 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 Stays

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 back-stay is also required for structural design reasons.

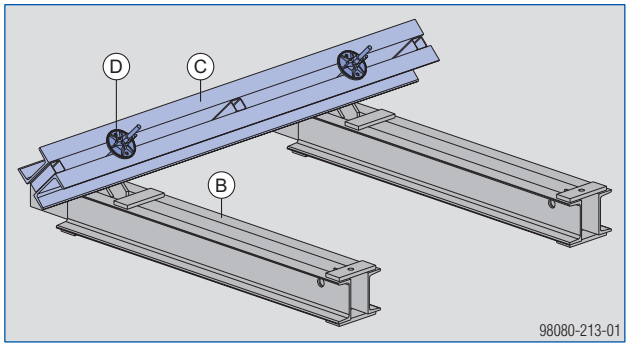
For more information on anchoring in the base slab, see the User Information booklet 'Doka supporting construction frames'.

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.

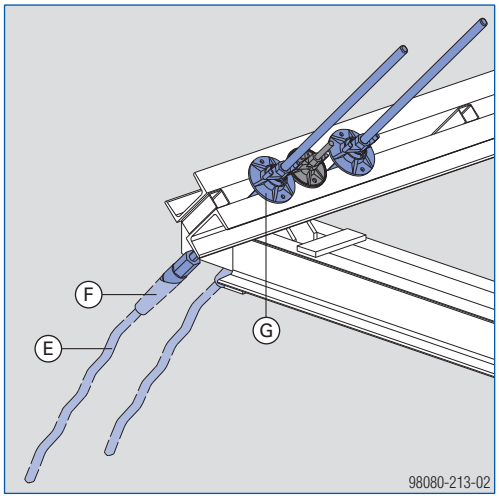


B Starter-block unit D22

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

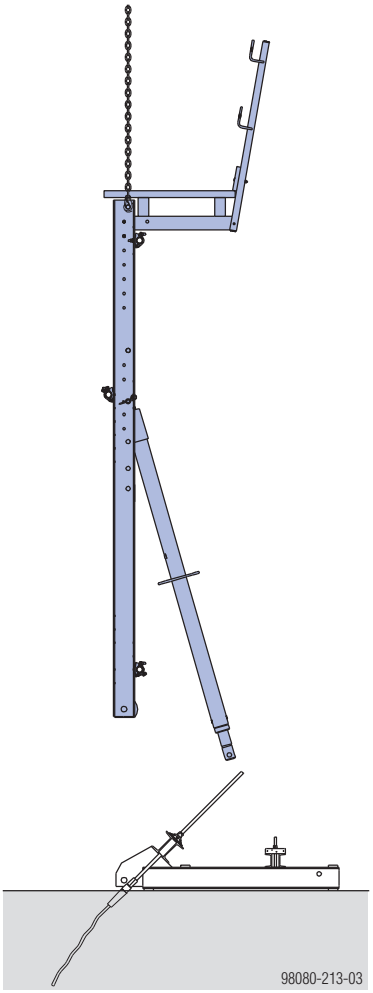
G Super-plate

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

Vertical-waling unit:

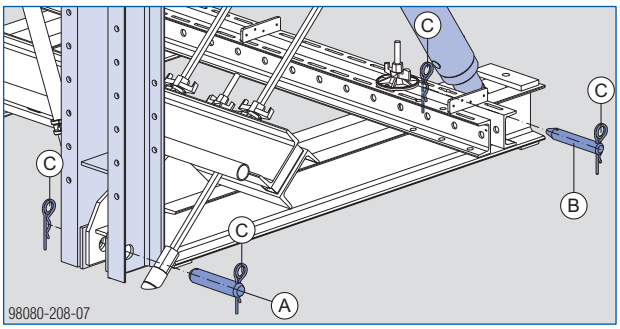
➤ Attach the lifting chain to the suspension bolts of the Vertical waling.

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



➤ Pin the Vertical waling to the Starter-block unit with a Swivel bolt d40 and secure this with 2 spring cotters.

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



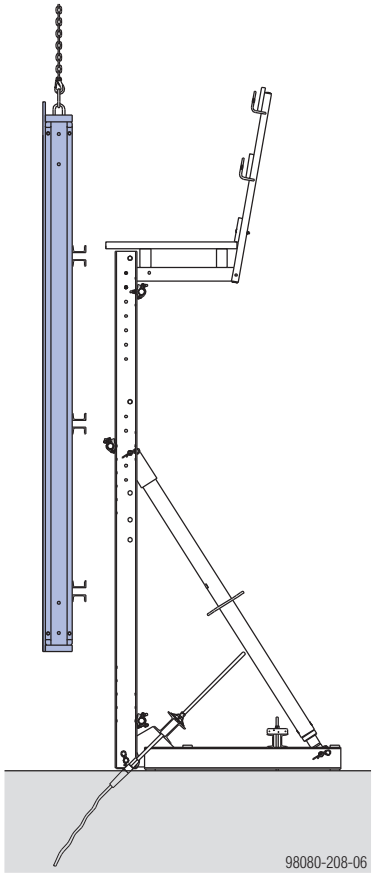
A	Swivel bolt d40
B	Swivel bolt 208
C	Spring cotter

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

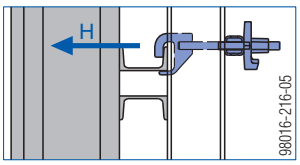
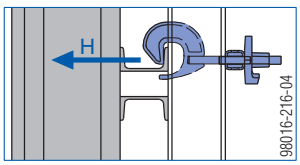
Formwork:

➤ Attach the crane suspension tackle 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.

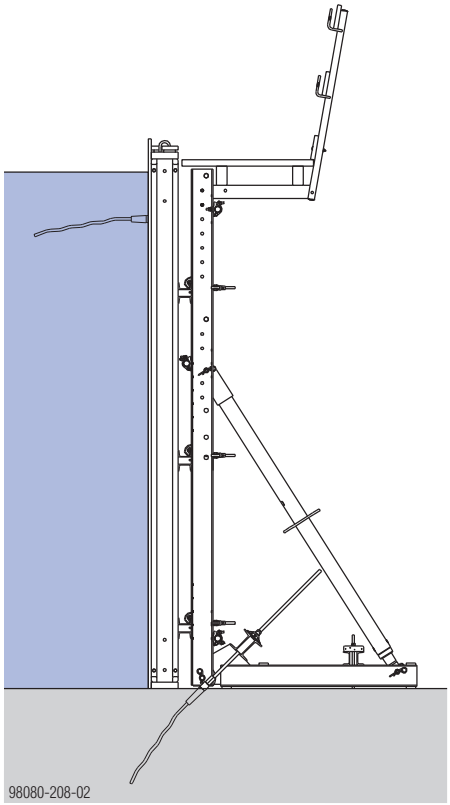
Waling-to-bracket holder	Waling-to-bracket holder (new version)
H ... permitted horizontal load: 11 kN	H ... permitted horizontal load: 22 kN
	

If the multi-purpose waling collides with the Adjusting spindle:

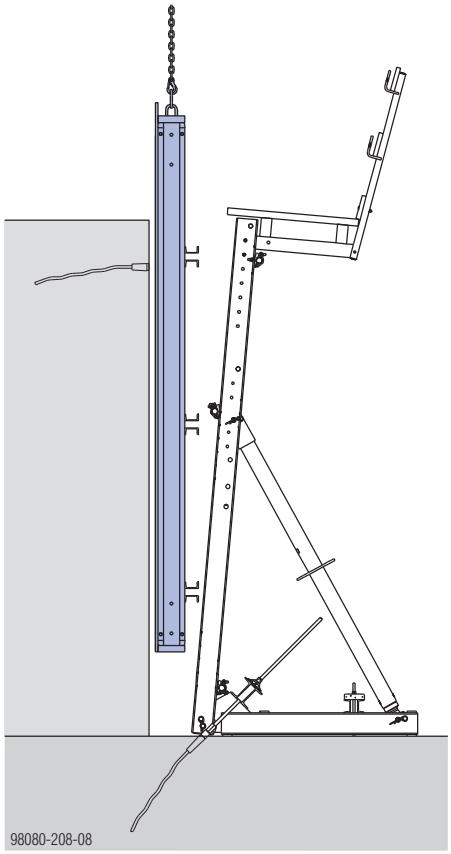
➤ Dismount the Adjusting spindle.
The Adjusting spindle is not needed until the formwork is deployed on the Cantilever bracket.

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.



- ➤ Stripping (see the section headed 'Opening the formwork').
- ➤ Remove the waling-to-bracket holder.
- ➤ Attach the crane suspension tackle to the lifting brackets on the formwork gang.
- ➤ Lift the formwork element off the vertical-waling unit.



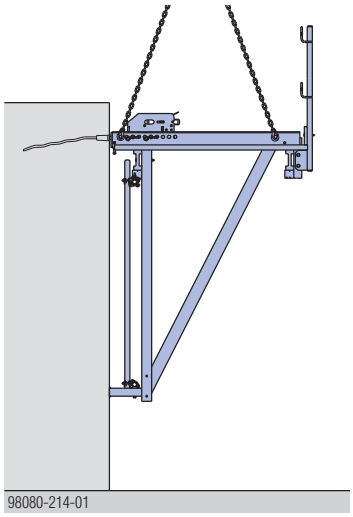
- ➤ Clean the formwork.
- ➤ Set the gang-form down on a flat surface, with the form-ply facing downwards.
- ➤ Attach the crane suspension tackle to the suspension bolts of the vertical waling.
- ➤ Undo the pinned connections between the vertical-waling unit and the starter-block unit.
- ➤ Lift the vertical-waling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

2nd casting section

Hanging the working platform into place on the suspension points

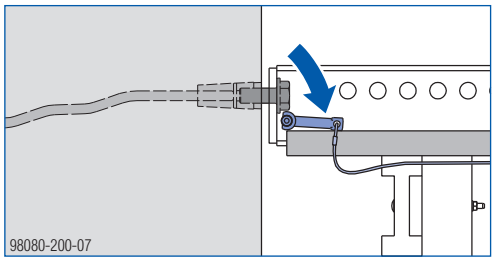
➤ Prepare the suspension points.

➤ 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 pins.

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



➤ Remove the lifting chain.

➤ 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.

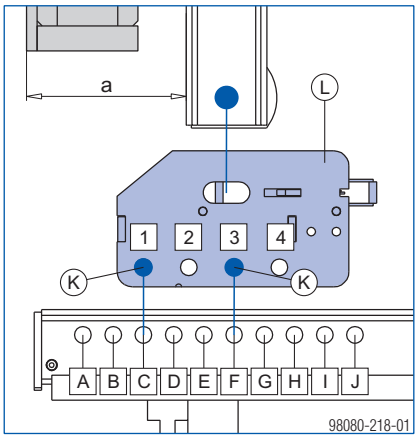
Positioning the Swivel bearing plate

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

Swivel bearing plate D22

Overall height of formwork [mm]		Pinning position	
min.	max.	1 Pin	2 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 D22 into the Cantilever bracket with both Swivel bolts 208 and secure each of these with 2 spring cotters.



K Swivel bolt 208

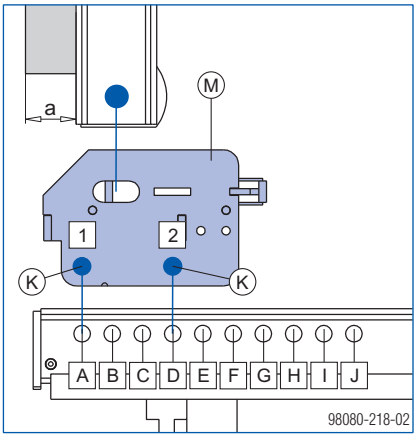
L Swivel bearing plate D22

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

Swivel bearing plate D22 S

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

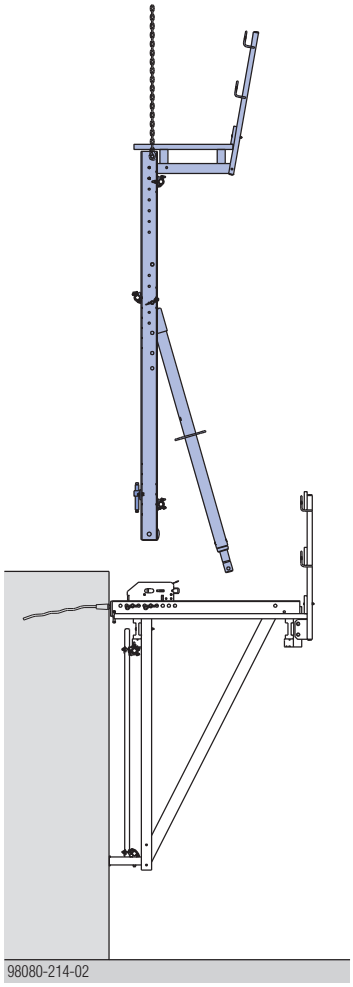
➤ Pin the Swivel bearing plate D22 S into the Cantilever bracket with both Swivel bolts 208 and secure each of these with 2 spring cotters.



K Swivel bolt 208
M Swivel bearing plate D22 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.

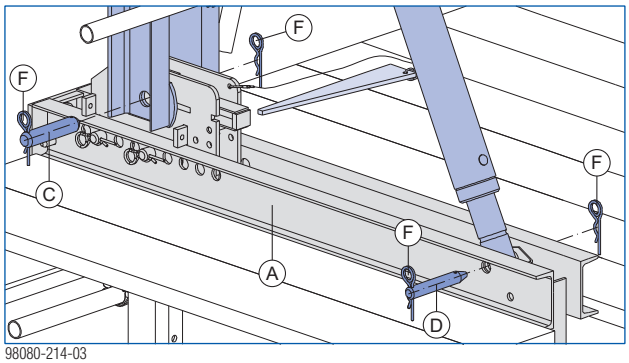


➤ Remove the wedge from the Swivel bearing plate.
➤ Pin the Vertical waling to the Swivel bearing plate with a Swivel bolt d40 and secure this with 2 spring cotters.

Pinning the spindle struts:

Variant 1: Dam formwork D22 K

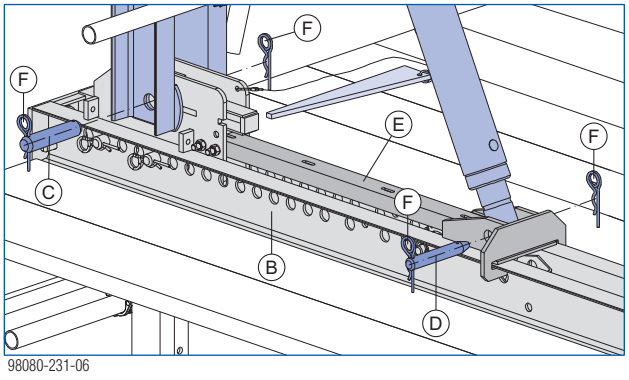
➤ Pin the Spindle strut to the Cantilever bracket with a Swivel bolt 208 and secure this with 2 spring cotters.



98080-214-03

Variant 2: Dam formwork D22 F

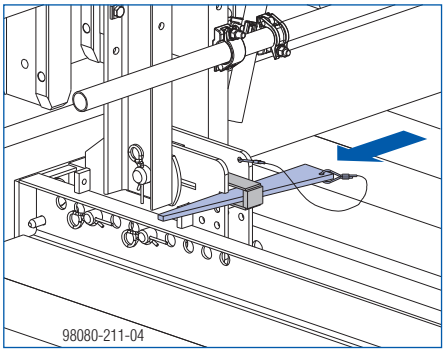
➤ Pin the Spindle strut to the Travelling profile with a Swivel bolt 208 and secure this with 2 spring cotters.



98080-231-06

A	Cantilever bracket D22 K
B	Cantilever bracket D22 F
C	Swivel bolt d40
D	Swivel bolt 208
E	Travelling profile D22
F	Spring cotter

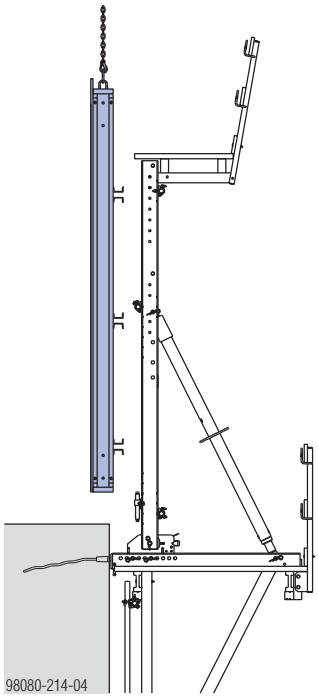
➤ Hammer in the wedge in the release position.


98080-211-04

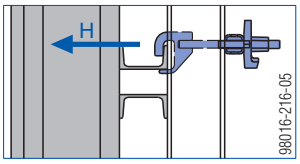
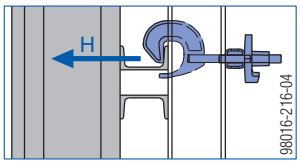
Mounting the formwork to the vertical-waling unit

➤ Attach the crane suspension tackle to the lifting brackets on the pre-assembled formwork.

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

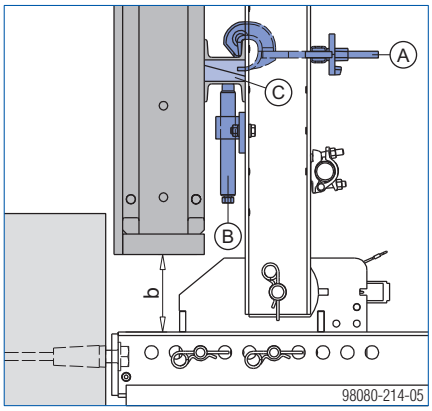

98080-214-04

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

Waling-to-bracket holder	Waling-to-bracket holder (new version)
H ... permitted horizontal load: 11 kN	H ... permitted horizontal load: 22 kN
 98016-216-05	 98016-216-04

➤ Fix timber wedges in the multi-purpose walings (for better load-transfer in the area around the adjusting spindles).

➤ Adjust dimension 'b' as per shop drawing / assembly plan, using the adjusting spindle (see the section headed 'Plumbing and aligning the formwork').

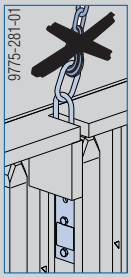


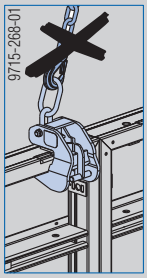
A	Waling-to-bracket holder
B	Height-adjusting spindle
C	Timber wedges

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

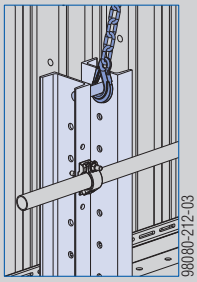
WARNING

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

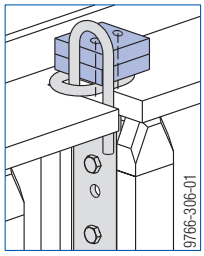




➤ Attach the crane suspension tackle to the suspension bolts of the vertical waling.



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

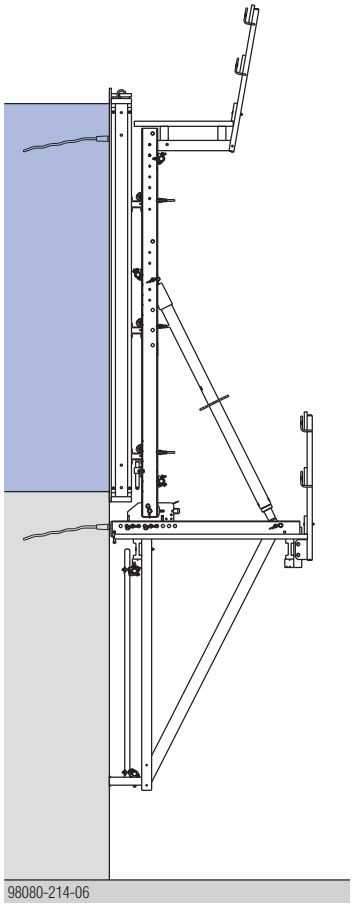


Closing / pouring / opening

➤ Apply concrete release agent.

➤ Close the formwork (see the section headed 'Closing the formwork').

➤ Pour the 2nd section.

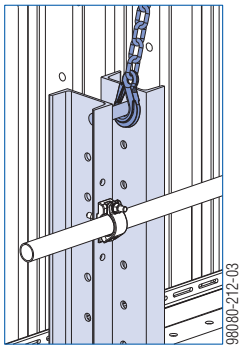


➤ Stripping (see the section headed 'Opening the formwork').

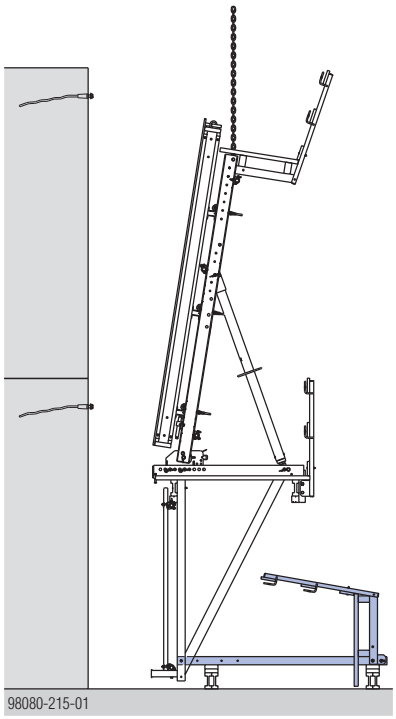
➤ Clean the formwork.

3rd casting section

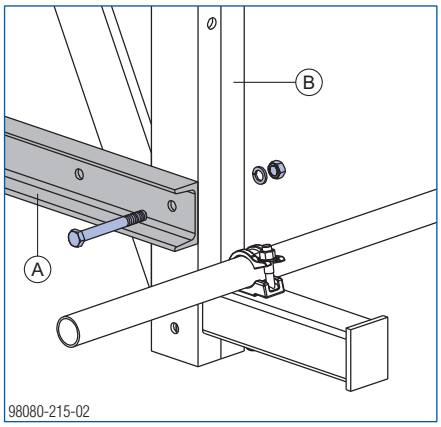
➤ Prepare the suspension points.
➤ Attach the lifting chain to the suspension bolts of the Vertical waling.



➤ 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.

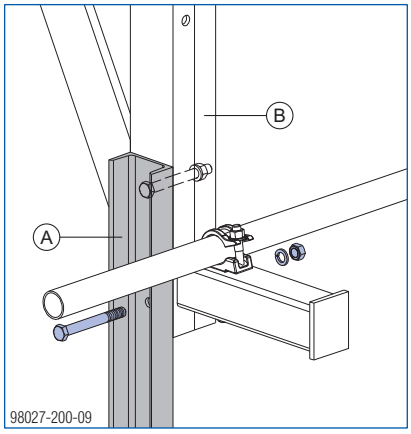


A Suspension profile D15/D22
B Cantilever bracket D22

Each Suspension profile D15/D22 is supplied complete with:

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

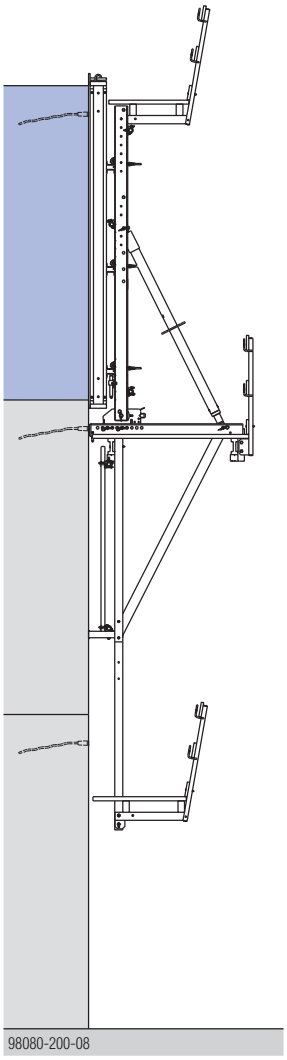
➤ Lift the entire unit by crane and hang it into place in the suspension point.
➤ Secure the working platform with fastening bolts.
➤ Bolt the Suspension profile D15/D22 of the pre-assembled suspended platform to the Cantilever bracket with the second M16 hexagon bolt.



A Suspension profile D15/D22
B Cantilever bracket D22

Closing / pouring / opening

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

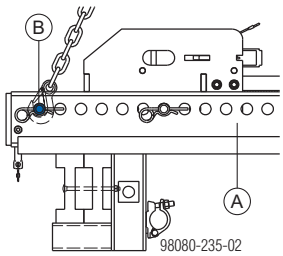
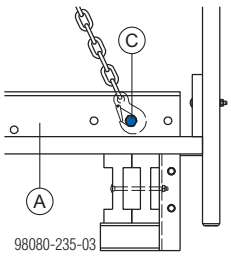


➤ Stripping (see the section headed 'Opening the formwork').
➤ Clean the formwork.

2nd casting section D22 F assembled from individual parts

Preparing the crane hoisting points

- ➤ Pin the 2nd Swivel bolt 208 of the swivel bearing plate in the first pin-hole of the Horizontal profile D22 F and secure it with 2 spring cotters D6.
- ➤ Insert Connecting pin 25cm into the second-last hole in Horizontal profile D22 F and secure the connecting pin with Spring cotter 5mm.
- ➤ Attach a four-part lifting chain (e.g. Doka 4-part chain 3.20m) to the front and rear crane hoisting points of the pre-assembled working platform.

Front crane hoisting point	Rear crane hoisting point
	

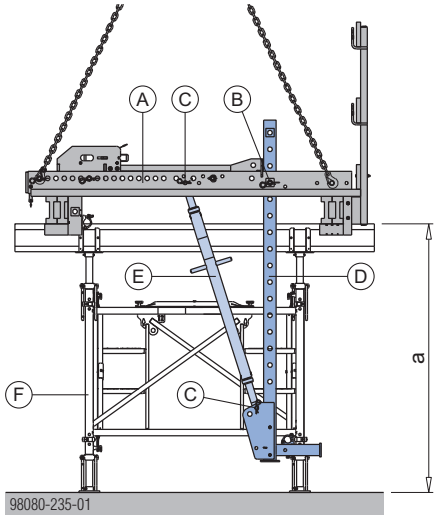
A Horizontal profile D22 F
B Swivel bolt 208 + Spring cotter D6
C Connecting pin 25cm + Spring cotter 5mm

Installing Vertical profile D22 F

NOTICE

- ➤ Secure the temporary support so that it cannot tip over.

- ➤ Set down the pre-assembled working platform on a temporary support.
- ➤ In accordance with the project plan, pin Vertical profile D22 F into Horizontal profile D22 F with Swivel bolt 208 and secure the swivel bolt with Spring cotter D6.
- ➤ Pin Spindle strut T7 into Horizontal profile D22 F and Vertical profile D22 F with Connecting pin and secure the connecting pin with Spring cotter 5mm.



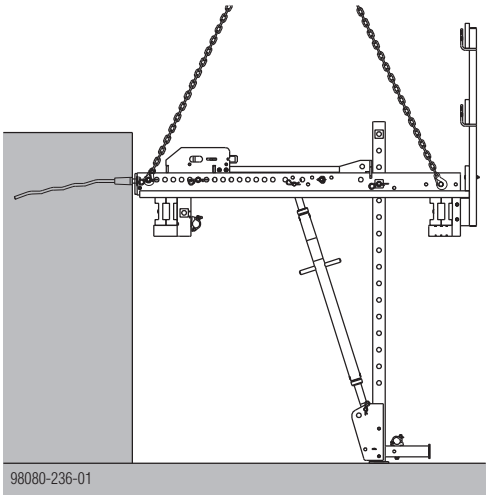
a ... height of temporary support: min. 1,80 m

A Horizontal profile D22 F
B Swivel bolt 208 + Spring cotter D6
C Connecting pin 25cm + Spring cotter 5mm
D Vertical profile D22 F
E Spindle strut T7
F Temporary support (e.g. Load-bearing tower Staxo 100)

Engage working platform in suspension point and secure

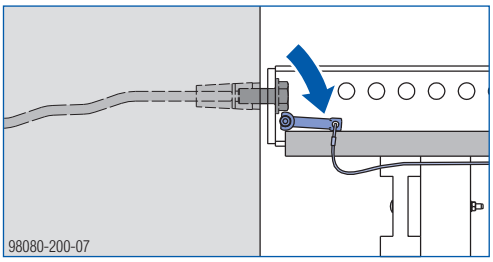
➤ Prepare the suspension points.

➤ Using a 4-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 pins.

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



➤ Remove the crane lifting tackle.

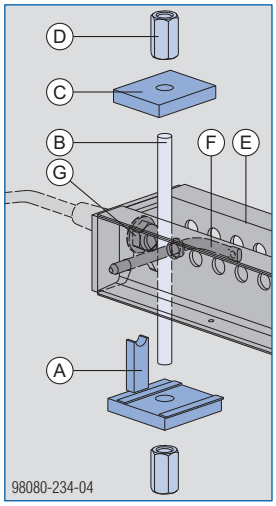
CAUTION

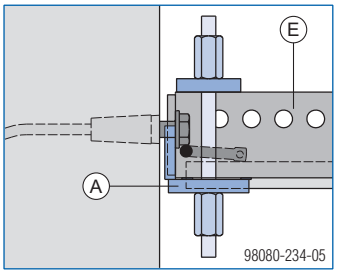
Risk of lift-out when working platforms are propped on the ground.

Securing by means of the fastening clamp is not sufficient for the forces that occur during pouring!

➤ Additionally secure the working platform with Locking plate D22 F.

➤ Install Locking plate D22 F.





A	Locking plate D22 F
B	Tie rod 26.5
C	Anchor plate 26.5
D	Hexagon nut 26.5
E	Horizontal profile D22 F
F	Fastening pin
G	Cone screw M30 SW50 7cm

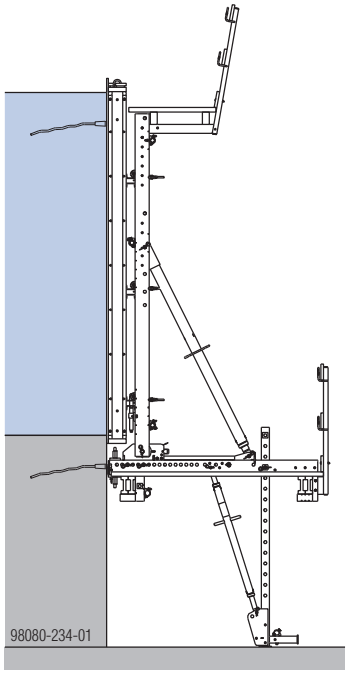
Note:

In the following steps, proceed in the same way as with the permanently welded cantilever bracket.

- Position the swivel bearing plate
- Mount the vertical-waling unit to the working platform
- Mount the formwork to the vertical-waling unit

Closing / pouring / opening

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



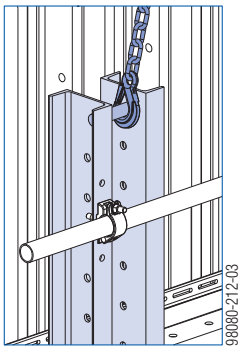
- ➤ Stripping (see the section headed 'Opening the formwork').
- ➤ Clean the formwork.

Modifying cantilever bracket for 3rd casting section

NOTICE

- There must be a flat, firm base capable of supporting the load.
- Provide a sufficiently large dismantling space.
- Follow the instructions in the section headed 'Lifting by crane'!

➤ Attach the crane suspension tackle to the suspension bolts of the vertical waling.



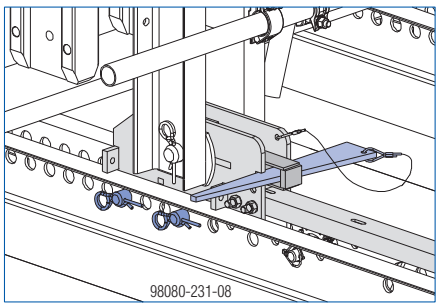
➤ Remove Locking plate D22 F.

➤ Remove the fastening pins (= anti-liftout guard) from the suspension points.

➤ Remove the guardrail boards from the pouring platform.

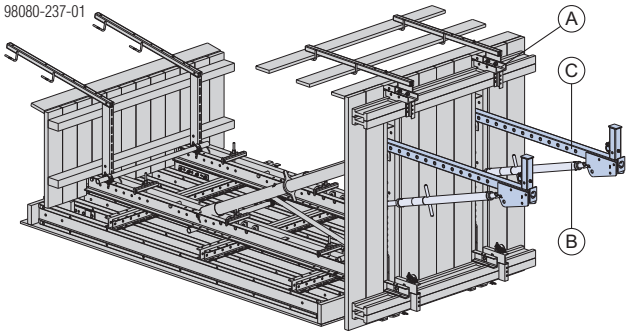
➤ Check the Swivel bearing plate D22 before every repositioning operation.

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



➤ Lift the entire unit slightly with the crane, swing it away from the structure and set it down on the ground.

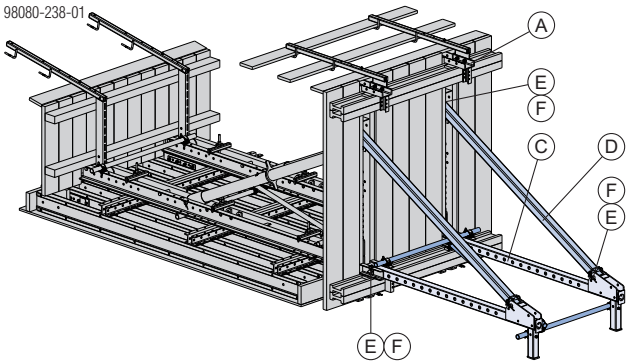
➤ Remove both Spindle struts T7 and Vertical profiles D22 F.



A	Horizontal profile D22 F
B	Spindle strut T7
C	Vertical profile D22 F

➤ Pin Vertical profile D22 F into the horizontal profile with a Swivel bolt 208 and secure the swivel bolt with 2 Spring cotters D6.

➤ Pin Pressure struts D22 F into the horizontal profile and Vertical Profile D22 F with Swivel bolts 208 and secure each swivel bolt with 2 Spring cotters D6.

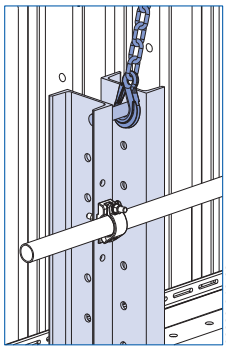


A	Horizontal profile D22 F
C	Vertical profile D22 F
D	Pressure strut D22 F
E	Swivel bolt 208
F	Spring cotter D6

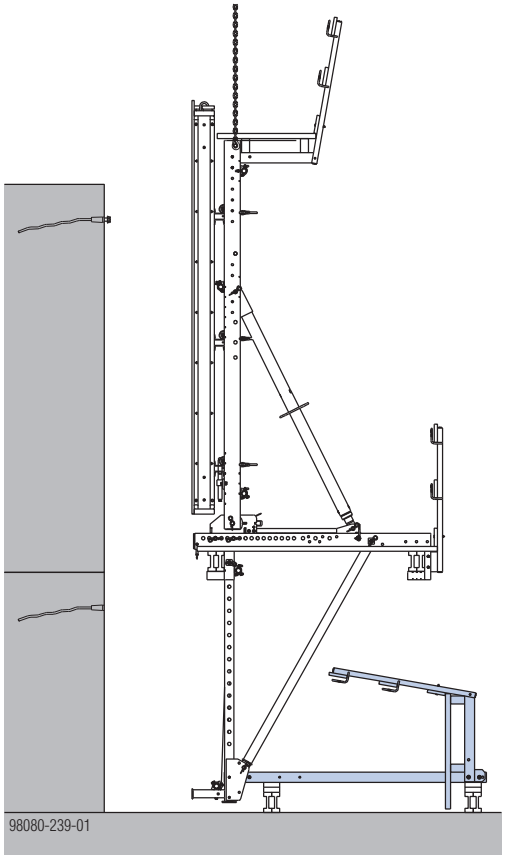
➤ Mount the bracing tubes. See the section headed 'Fitting the bracing tubes'.

3rd casting section, Cantilever bracket D22 F assembled from individual parts

➤ Prepare the suspension points.
➤ Attach the crane suspension tackle to the suspension bolts of the vertical waling.

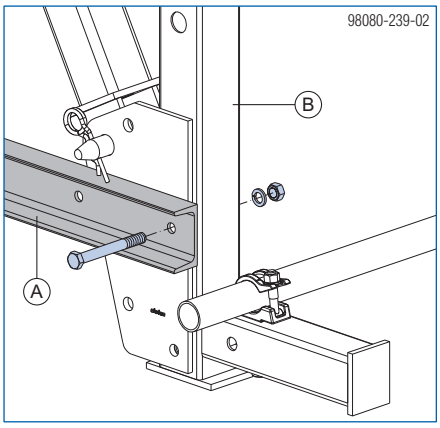


➤ Crane-lift the entire unit to the pre-assembled suspended platform.



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

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

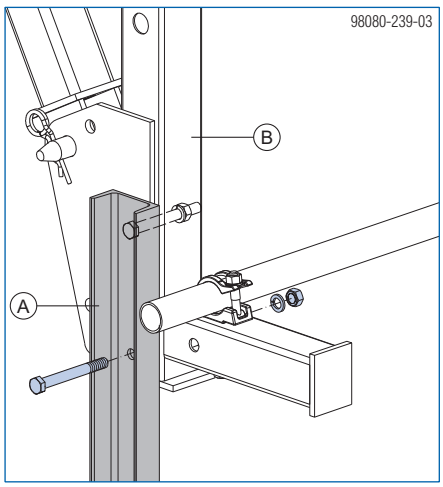


A Suspension profile D15/D22
B Vertical profile D22 F

Each Suspension profile D15/D22 is supplied complete with:

- 2 hexagon bolts M16x140
- 2 spring washers A16
- 2 hexagon nuts M16

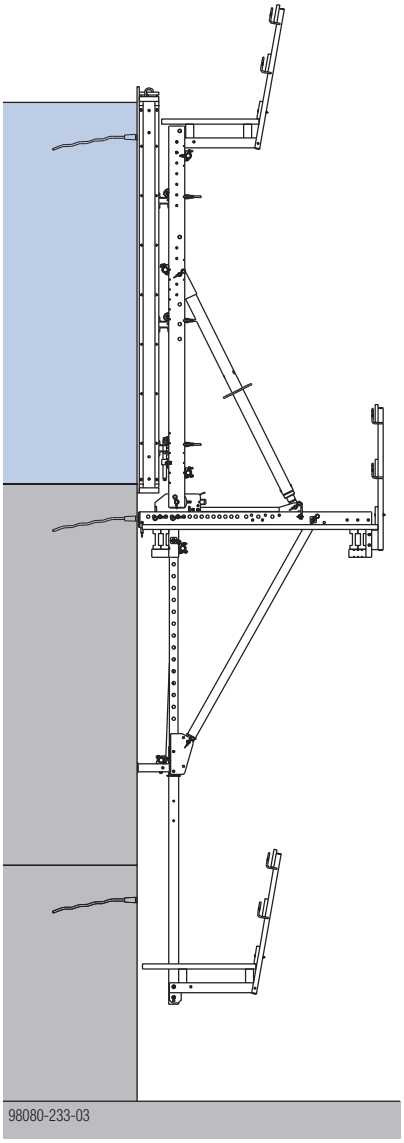
➤ Lift the entire unit by crane and hang it into place in the suspension point.
➤ Secure the working platform with fastening bolts.
➤ Bolt the Suspension profile D15/D22 of the pre-assembled suspended platform to the Cantilever bracket with the second M16 hexagon bolt.



A Suspension profile D15/D22
B Vertical profile D22 F

Closing / pouring / opening

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



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

Assembly

Assembling the working platform

➤ Follow the shop drawing / assembly plan.

NOTICE

When making project-specific platforms, observe the following points:

- Position brackets as symmetrically as possible and keep their cantilever short.
- Ensure that all loads are applied centrally.
- The stability of the platforms must be ensured during all phases of the construction work!

CAUTION

Risk of platforms tipping over when **loads are applied eccentrically**.

If it is un-avoidable to extend a cantilever to one side, observe the following points:

➤ Choose the widest possible bracket spacing in relation to the cantilever!

➤ Allow for the greater influence on the bracket in the cantilevering region!

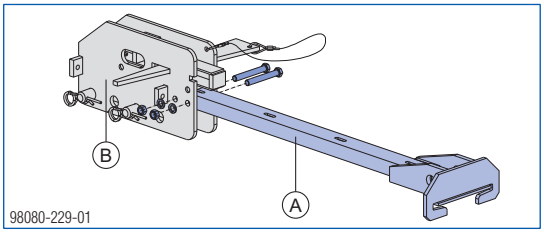
➤ Contact your Doka technician for information on further measures to prevent platforms tipping over.

The anti-liftout guards are not suitable for sustaining planned forces! The anti-liftout guard is only designed to prevent the platform from being accidentally lifted out of its suspension point while work is in progress.

Mounting the Travelling profile (optional)

When used with the Cantilever bracket D22 F and the Travelling profile D22, the formwork is retractable, i.e. can be rolled back.

➤ Bolt the Travelling profile into the Swivel bearing plate.



A Travelling profile D22

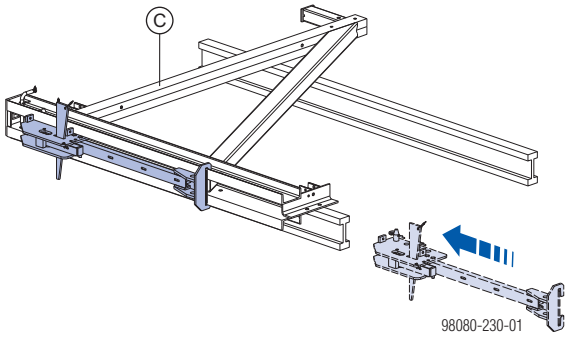
B Swivel bearing plate D22

Each Travelling profile is supplied complete with:

- 2 hexagon bolts M16x120
- 2 spring washers A16
- 2 hexagon nuts M16

➤ Dismount the pinion gear drive from the Cantilever bracket D22 F.

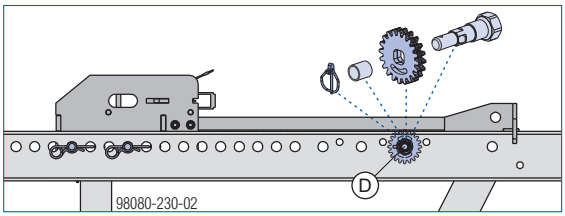
➤ Push the Travelling profile onto the Cantilever bracket. The catches must engage in the horizontal profile.



C Cantilever bracket D22 F

➤ Mount the pinion gear drive to the appropriate position in the Cantilever bracket.

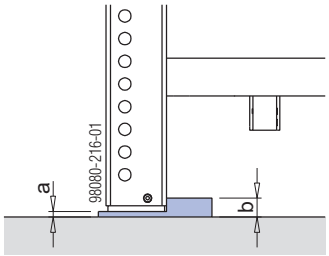
➤ Pin the Swivel bearing plate D22 into the Cantilever bracket D22F with both pins.



D Pinion gear drive

Fitting the bracing

➤ Prepare an assembly bench.



a ... 15 mm
b ... 50 mm

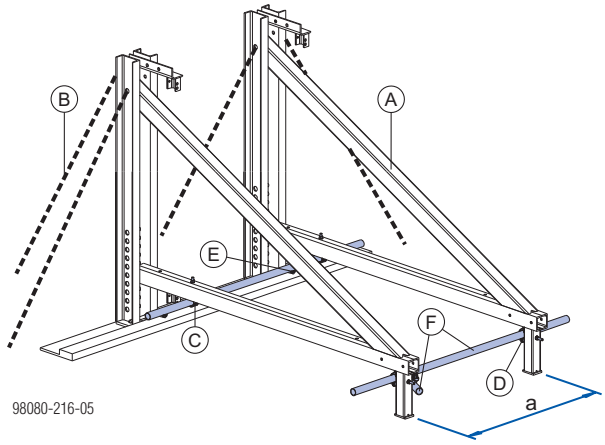
➤ Prepare the bracing.

➤ 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 scaffold tubes.

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



a ... centre-to-centre distance

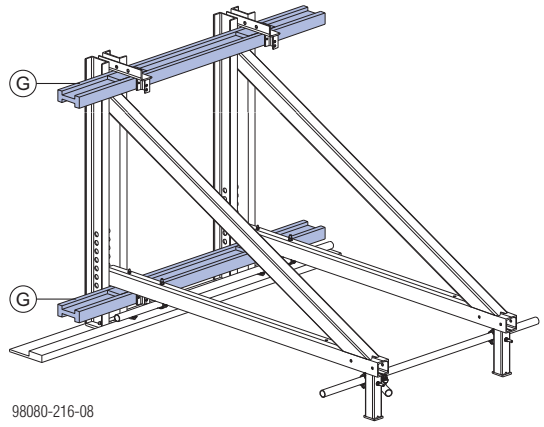
A	Cantilever bracket D22
B	Timber brace
C	Screw-on coupler 48mm (135 or 50)
D	Screw-on coupler 48mm (135 or 95)
E	Swivel coupler 48mm
F	Scaffold tube 48.3mm

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

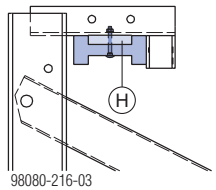
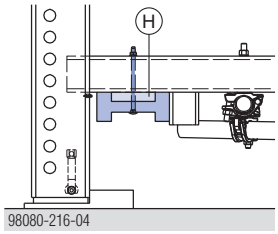
Mounting the decking supports

Note:
The choice of decking support depends 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

Top attachment	Bottom attachment
	

Threaded-fastener material required for each Cantilever bracket:
- 1 square bolt M10x90
- 1 square bolt M10x160
- 2 washers A10.5
- 2 hexagon nuts M10

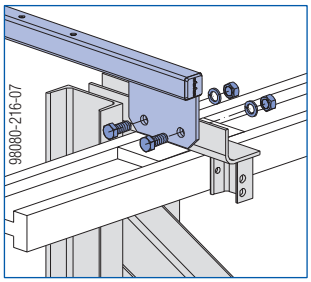
Dimensions

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

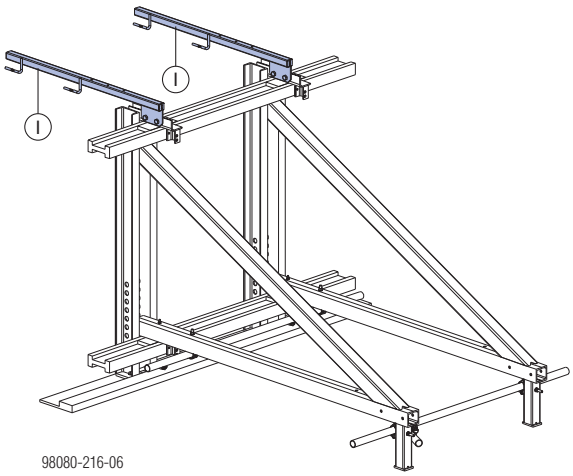
Length of wooden spacers approx. 50 cm.

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

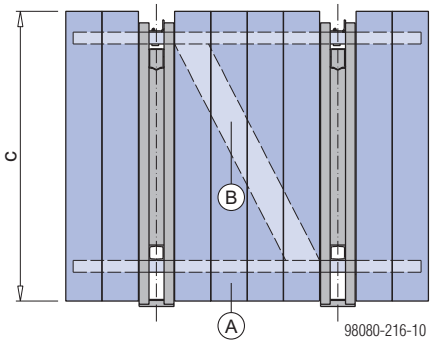
➤ Lay deck-boards **flush** to either side of the horizontal profiles.

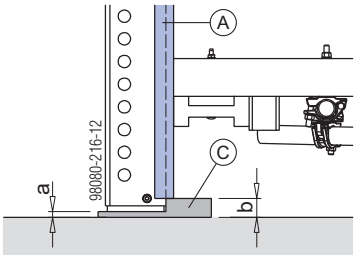
➤ Fasten deck-boards to the Doka beams with Torx TG 6x90 A2 universal countersunk screws.

Every deck-board must be fixed with 4 screws!

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

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



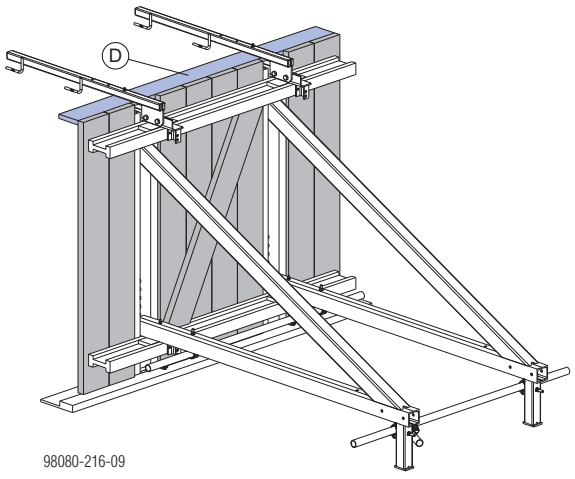


a ... 15 mm
b ... 50 mm

	D22 K	D22 F
c	1915 mm	2395 mm

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

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



D Toeboard min. 3/15 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 to EN 338.
Observe all national regulations applying to deck-boards and guard-rail boards.

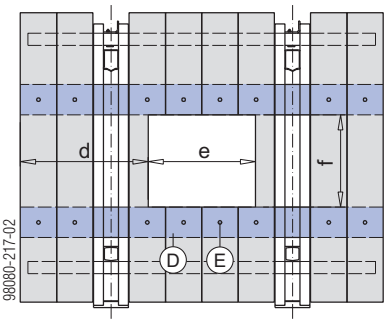
Fitting a manhole

➤ 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!

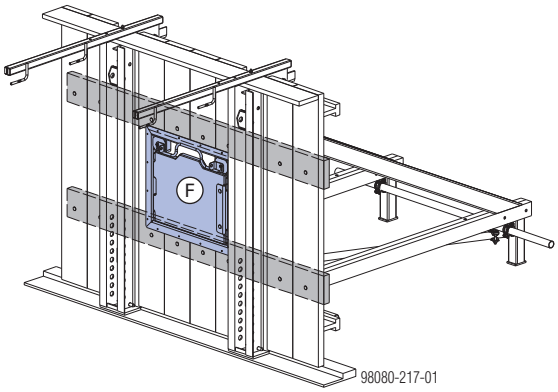
➤ Cut out the opening for the manhole.



d ... Minimum overlap: 2 whole deck-boards
e ... 710 mm
f ... 610 mm

D e.g. deck-board, 5x20 cm
E Square bolt M10 + washer R11 + hexagon nut M10

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



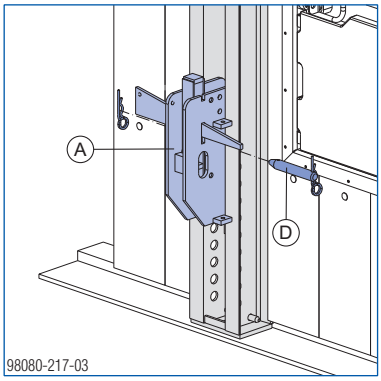
F Manhole B 70/60cm

Attaching the Swivel bearing plate

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

- **Swivel bearing plate D22**
  - 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 D22 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 208 and secure this with 2 spring cotters.

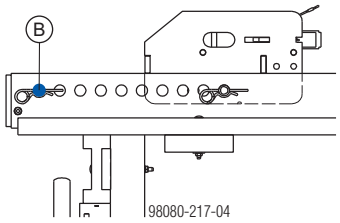
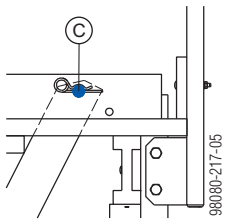


A Swivel bearing plate D22
D Swivel bolt 208

Preparing the crane hoisting points

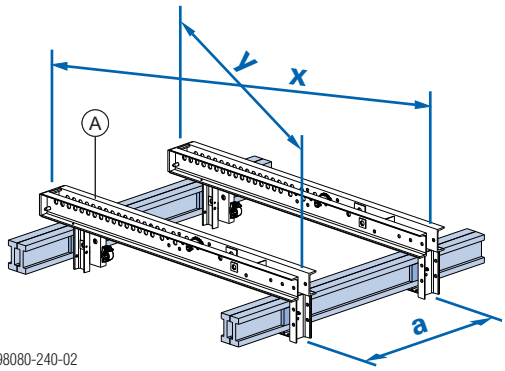
➤ Pin the 2nd Swivel bolt 208 **(B)** of the Swivel bearing plate in the first pin-hole of the Cantilever bracket and secure it with 2 spring cotters.

➤ Pin the Swivel bolt 208 **(C)** of the Spindle strut D22 into the Cantilever bracket and secure it with 2 spring cotters.

Front crane hoisting point	Rear crane hoisting point
	

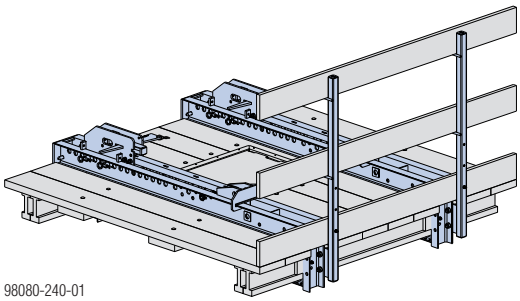
Assembling Working platform D22 F

- ➤ Follow the shop drawing / assembly plan.
- ➤ Lay down the horizontal profiles, spaced apart by the exact centre-to-centre distance.
- ➤ Bolt the Doka beams H20 to the Cantilever brackets.
- ➤ Arrange the horizontal profiles so that both diagonals are the same.

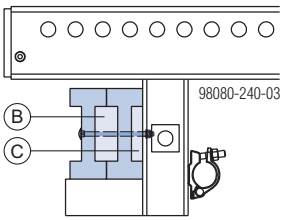
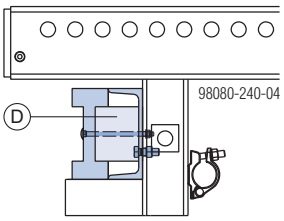


a ... centre-to-centre distance
x = y ... diagonals

A Horizontal profile D22 F



Note:
The choice of decking support depends on the project.

Variant 1 Pairs of H20 beams	Variant 2 Beam H20 + U200 section girder
	
Max. reaction load per support: 10 kN	Max. reaction load per support: 20 kN
Threaded-fastener material required for each connection: ▪ 1 square bolt M10x160 + hexagon nut M10 + spring washer A10	Threaded-fastener material required for each connection: ▪ 1 square bolt M10x160 + hexagon nut M10 + spring washer A10 ▪ 1 hexagon bolt M16x35 + hexagon nut M16 + spring washer A16

Dimensions of the wooden spacers

Type of beam	Wooden spacer [mm]		
	(B)	**(C)**	**(D)**
H20 P	58 x 118	29 x 118	97 x 118
H20 N	51 x 118	25 x 118	92 x 118

Length of wooden spacers: approx. 500 mm.

Note:
See the section headed 'Assembling the working platform' for detailed information on the remaining steps in the assembly procedure.

Mounting the pouring platform

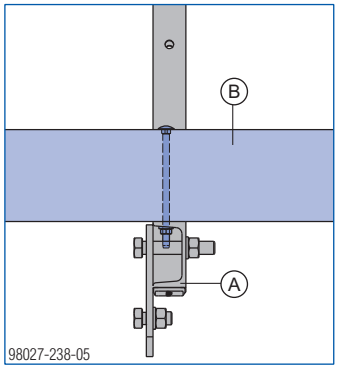
For details of how to assemble and operate the pouring platforms for the formwork system that is being used, see the 'Large-area formwork Top 50' or 'Framed formwork Framax Xlife' User Information booklets.

Note:
The plank and board thicknesses given here comply with the C24 category to EN 338.
Observe all national regulations applying to deck-boards and guardrail boards.

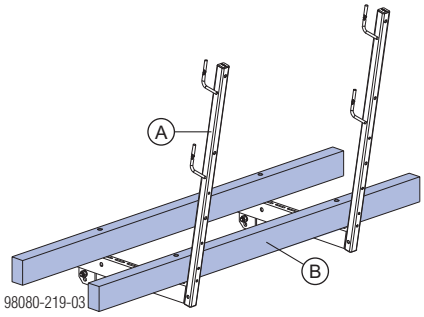
➤ Follow the shop drawing / assembly plan.

Mounting the decking supports

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



Threaded-fastener material required 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 M10



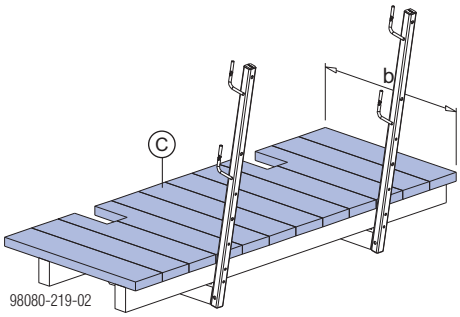
A Screw-on access bracket MF75
B Squared timber

Note:
The choice of decking support depends on the project.

Mounting the deck-boards

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

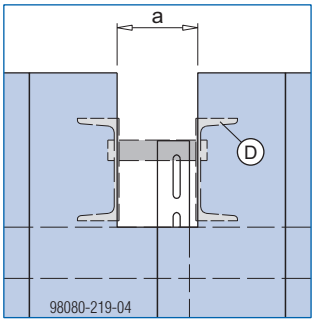
Every deck-board must be fixed with 4 screws!
Do a sight-check to make sure that the deck-boards have been fixed properly!



b ... 950 mm (for straight walls)

C e.g. plank 5/20 cm

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

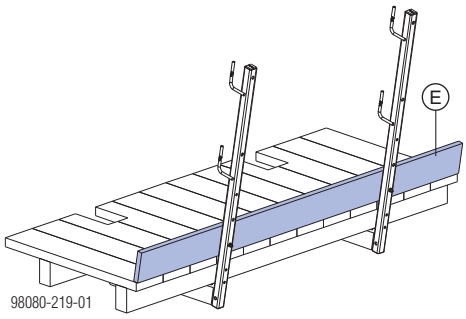


a ... 150 mm

D Vertical waling D22

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

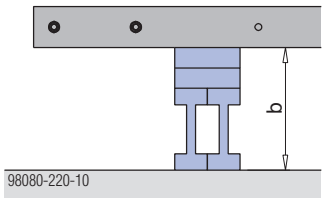
Assembling the suspended platform

Note:
The plank and board thicknesses given here comply with the C24 category of EN 338.
Observe all national regulations applying to deck-boards and guard-rail boards.

➤ Follow the shop drawing / assembly plan.

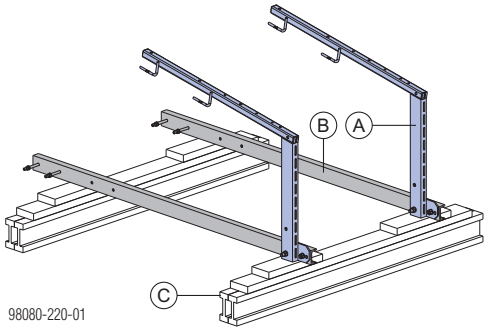
Mounting the Screw-on access bracket MF75

➤ Prepare hardwood blocking.

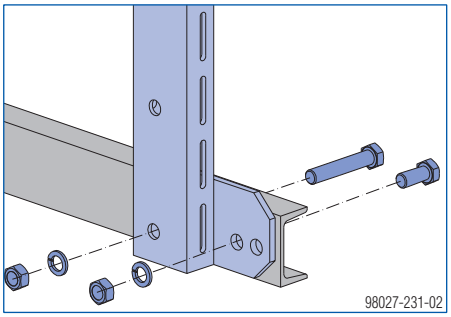


b ... 270 mm

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



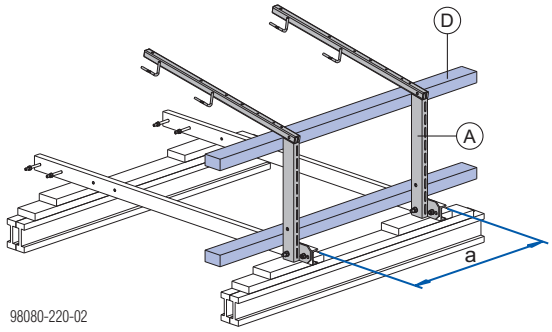
A	Screw-on access bracket MF75
B	Suspension profile D15/22
C	Hardwood blocking



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

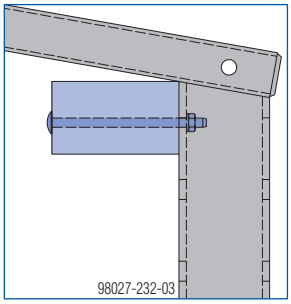
Mounting the decking supports

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



a ... centre-to-centre distance

A	Screw-on access bracket MF75
D	Squared timber



Threaded-fastener material required 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 M10

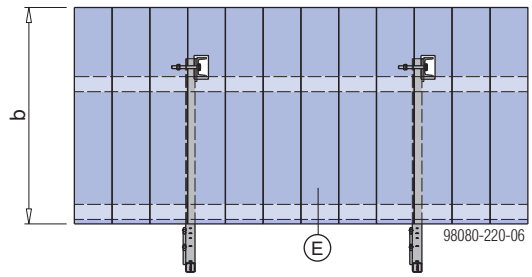
Note:
The choice of decking support depends on the project.

Mounting the deck-boards

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

Every deck-board must be fixed with 4 screws!

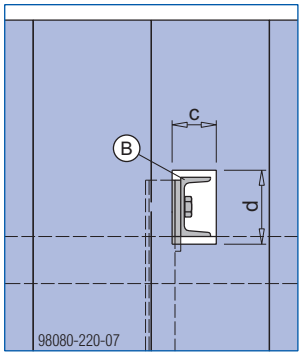
Do a sight-check to make sure that the deck-boards have been fixed properly!



b ... 1030 mm (for straight walls)

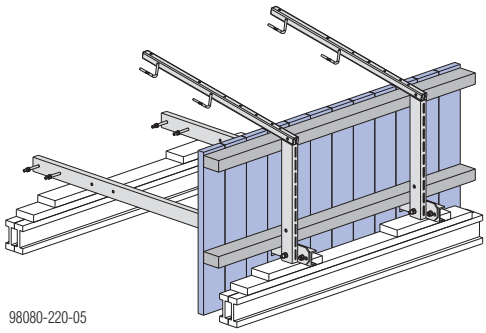
E Plank 5/20 cm

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



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

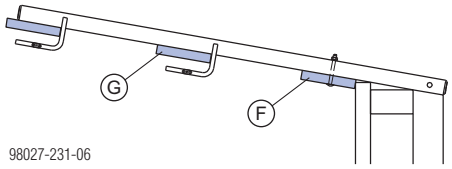
B Suspension profile D15/D22



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.



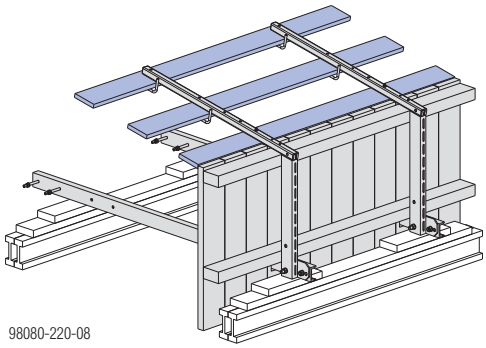
F Toeboard min. 15x3 cm

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

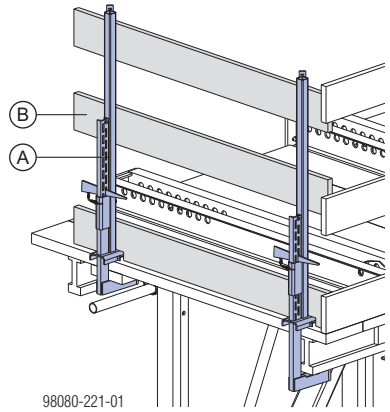
Platform railings which do not extend all the way around the platform must be closed by attaching side railings, e.g. at

- **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!
➤ Use personal fall-arrest systems (e.g. safety harness)
or
install the sideguards at the same time as the platforms are assembled.

Note:
The plank and board thicknesses stated comply with the EN 338 C24 timber.
Observe all national regulations applying to deck and guardrail boards.

Handrail clamp S



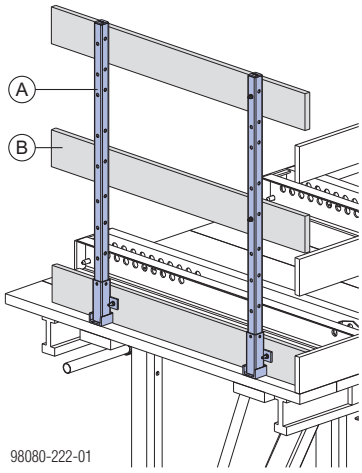
A Handrail clamp S
B Guard-rail board min. 3x15 cm (site-provided)

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

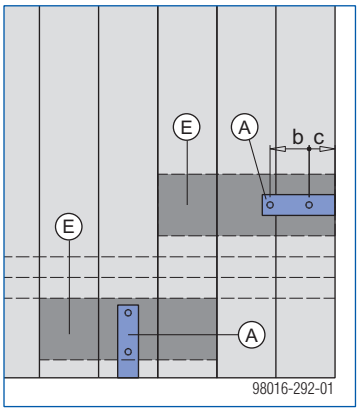


A Screw-on handrail post 1.50m
B Guardrail board min. 3/15 cm (site-provided)

Assembly:

NOTICE
➤ 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

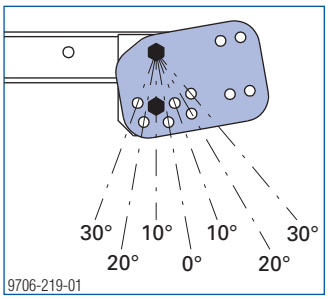
A Screw-on handrail post 1.50m
E Plank 5/20 cm

Required nuts & bolts etc. for each Screw-on handrail post
- 2 hex-head bolts M10
(length depends on thickness of decking)
- 2 washers 10 (ISO 7094, on timber side)
- 2 washers 10 (ISO 7089, on steel side)
- 2 hexagon nuts M10 (self-locking)

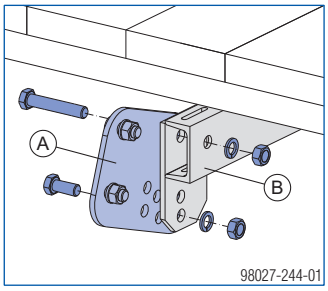
➤ Attach a toeboard (min. 15x3 cm) to the handrail-post uprights with M10 square bolts.
➤ Attach guardrail boards to the handrail-post uprights with M10 square bolts.

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.

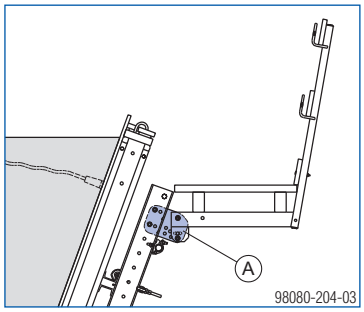


A Swivel plate MF
B Screw-on access bracket MF75

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

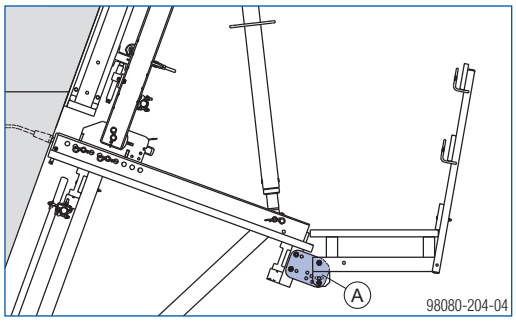
- 1 hexagon bolt M20x110
- 1 hexagon bolt M20x45
- 2 spring washers A20
- 2 hexagon nuts M20

e.g. on pouring platforms:



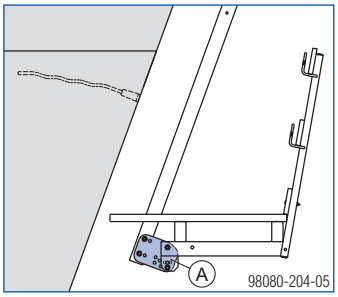
A Swivel plate MF

e.g. on working platforms:



A Swivel plate MF

e.g. on suspended platforms:



A Swivel plate MF

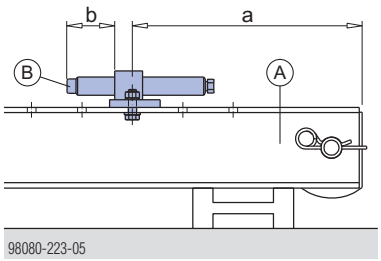
Assembling the vertical-waling unit

➤ 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.

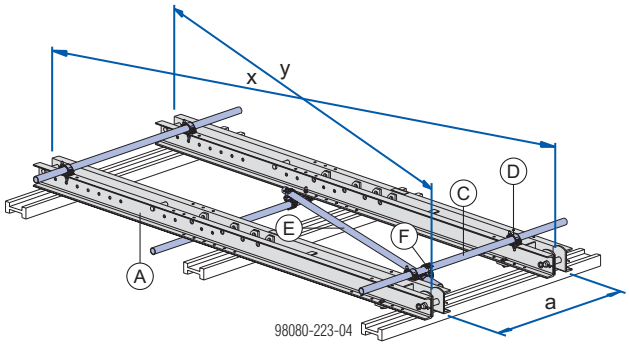


A Vertical waling D22
B Adjusting spindle

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

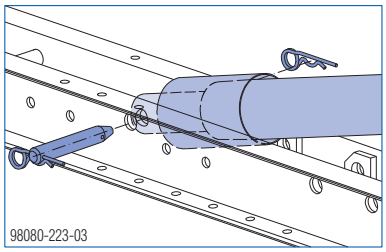
A Vertical waling D22
C Scaffolding tube 48.3mm (horizontal)
D Screw-on coupler 48mm 50
E Scaffolding tube 48.3mm (diagonal)
F Swivel coupler 48mm

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

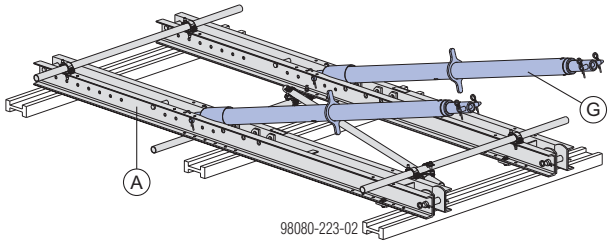
Note:
To make it possible to mount the ladders providing access to the pouring platforms, the scaffold tubes must be mounted in the positions shown.

Mounting the Spindle struts

➤ Pin the Spindle strut to the Vertical waling with a Swivel bolt 208 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.

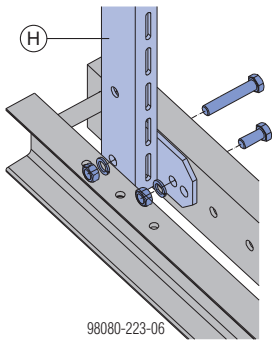
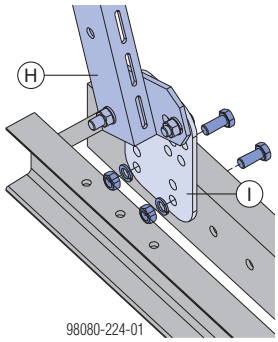


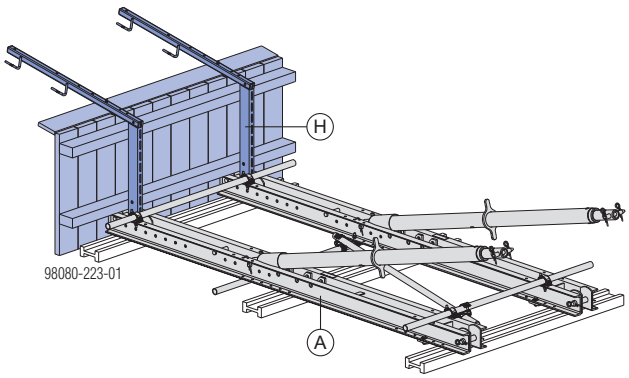
A Vertical waling D22
G Spindle strut D22

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 D22
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.

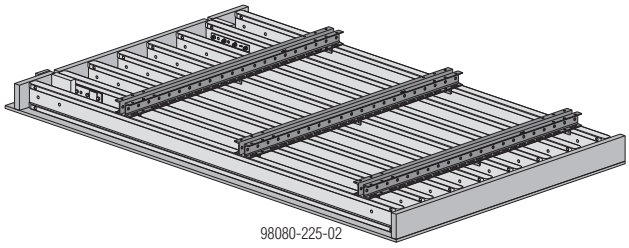
Timber-beam formwork

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.

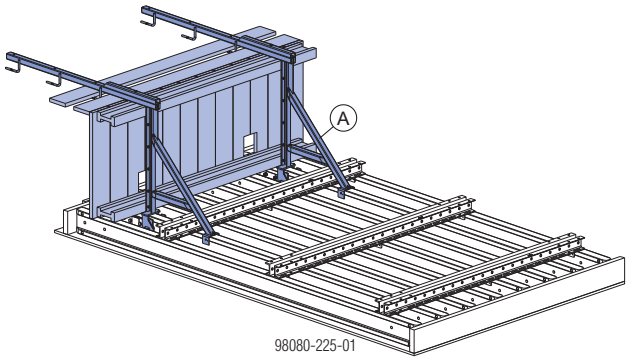


Mounting the pouring platform

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.

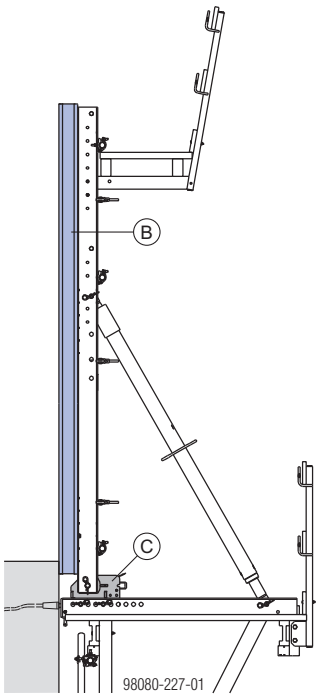


A Universal bracket 90

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



B Steel formwork

C Swivel bearing plate D22 S

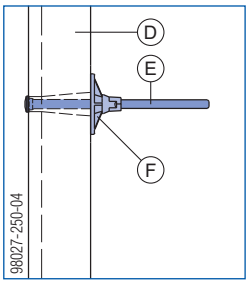
Framed formwork

e.g. framed formwork Framax Xlife

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

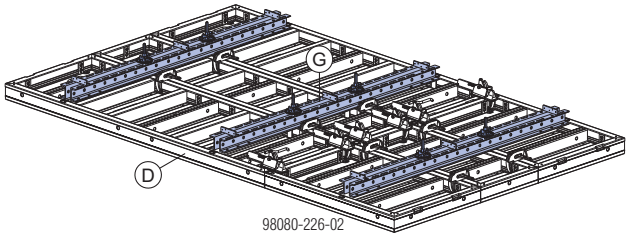
Preparing the formwork

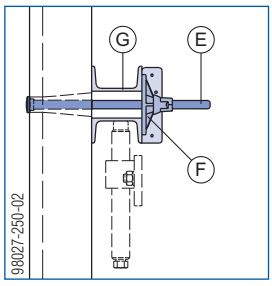
➤ With the formwork panels in the upright, fit 'Framax supporting construct. frame bolts' into the tie-holes and secure them with Super-plates 15.0.



➤ 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.

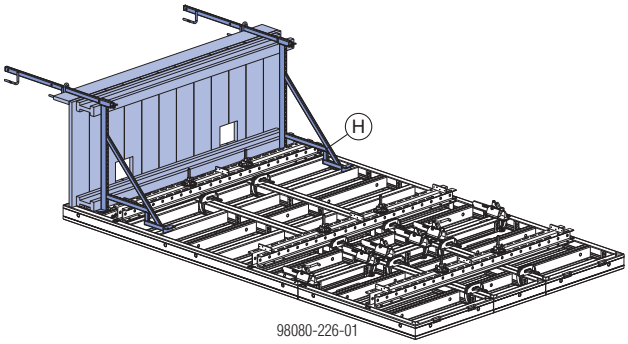
D Framed formwork Framax Xlife
E Framax supporting construct. frame bolt 36cm
F Super-plate 15.0
G Multi-purpose waling WS10 Top50

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

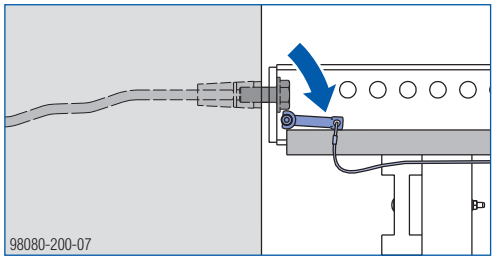
NOTICE

- There must be a flat, firm base capable of supporting the load.
- Provide a sufficiently large dismantling space.
- Follow the instructions in the section headed 'Lifting by crane'!

Lifting the formwork off the climbing unit

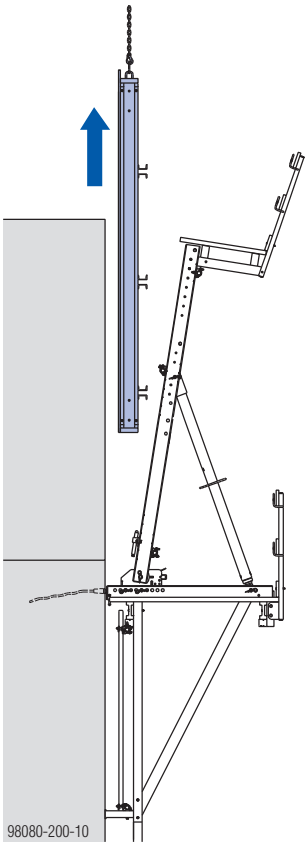
➤ Stripping (see the section headed 'Opening the formwork').

The fastening pin must be in the horizontal!



➤ Attach the crane suspension tackle 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.



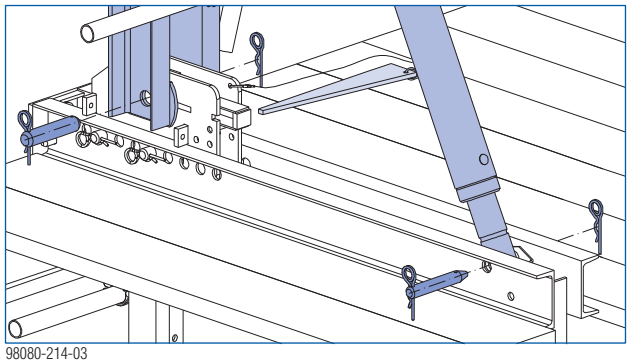
➤ Set down and dismantle the formwork element.

➤ Attach the crane suspension tackle to the suspension bolts of the vertical waling.

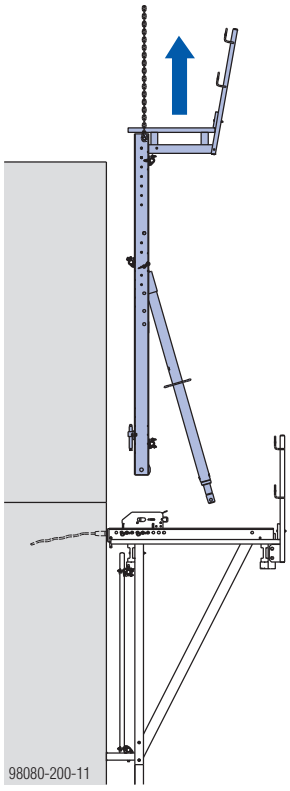
➤ Undo the pinned connection between the vertical waling and the swivel bearing plate.

➤ Undo the pinned connection between the Spindle strut and the Cantilever bracket or Travelling profile D22.

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



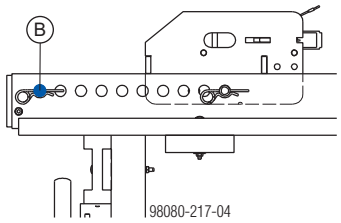
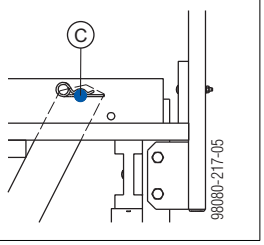
➤ Lift the vertical-waling unit off the climbing unit and set it down.



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).

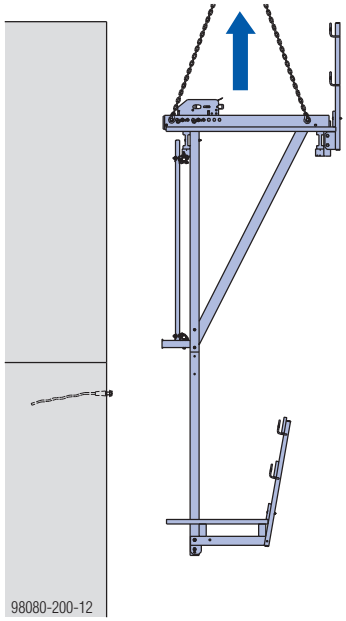
Front crane hoisting point	Rear crane hoisting point
	

B Swivel bolt 208 (Swivel bearing plate)

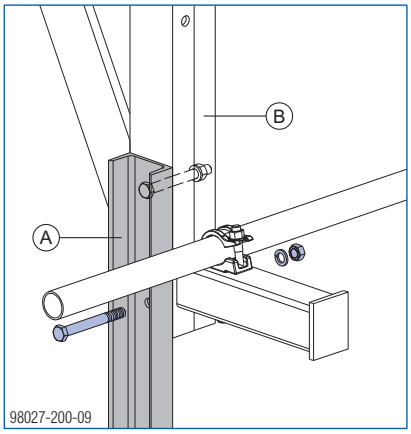
C Swivel bolt 208 (Spindle strut D22)

➤ Remove the fastening pins (= anti-liftout guard) from the suspension points.

➤ Gently raise the entire unit by crane, and move it away from the building.



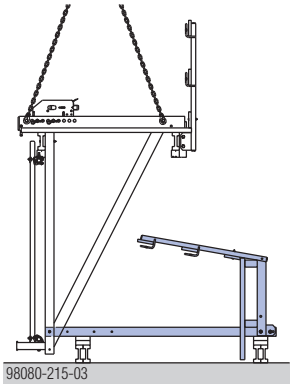
➤ Dismount the bottom hexagon bolts M16 from the Cantilever brackets.



A Suspension profile D15/D22

B Cantilever bracket D22

➤ Set down the climbing unit and dismantle it.

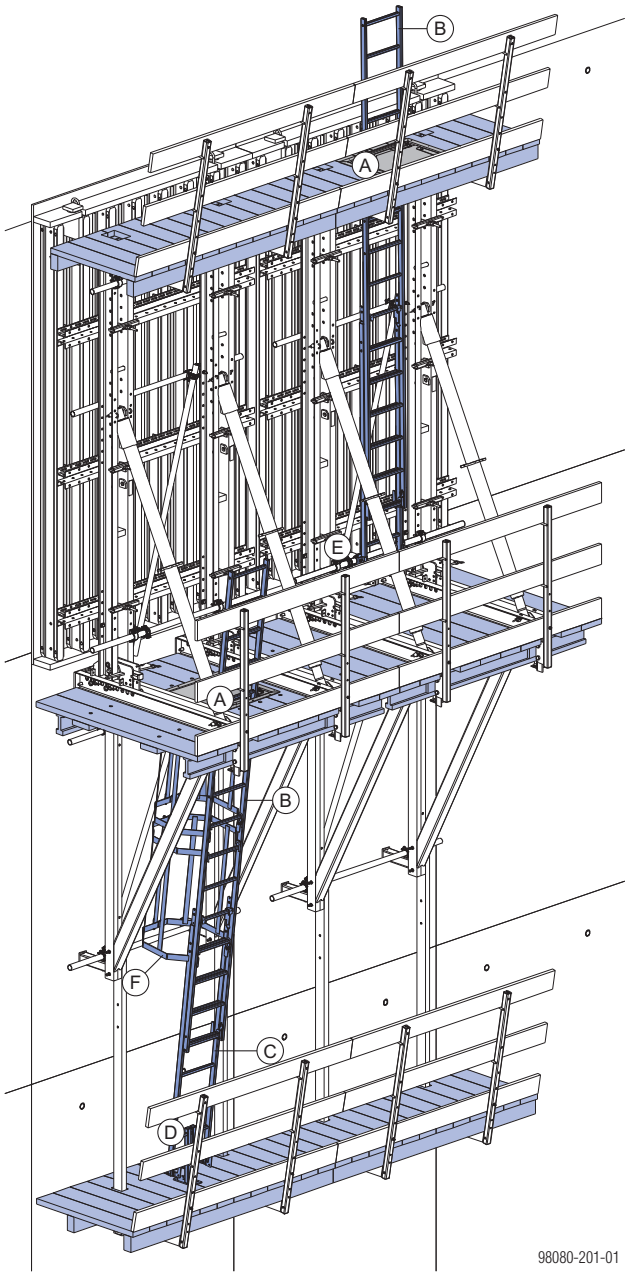


➤ From this point on disassembly takes place on the ground and is the reverse of the assembly procedure.

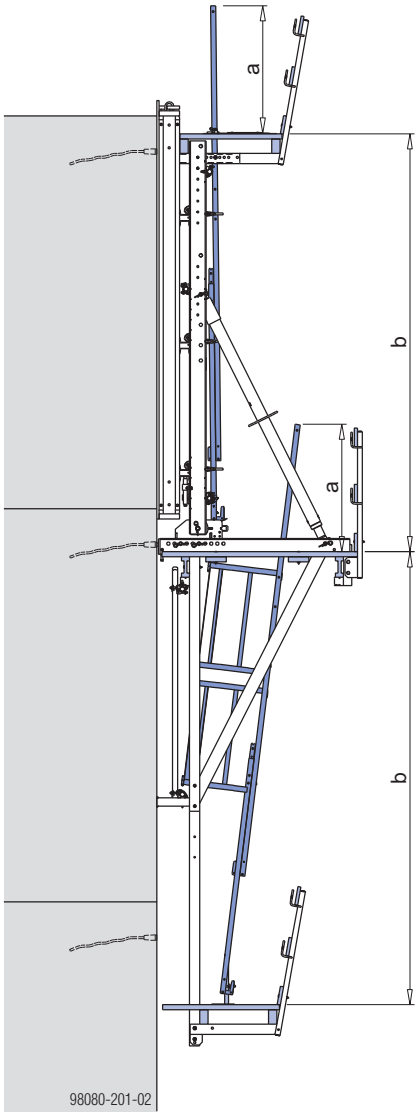
General

Ladder system

For safe up-and-down access between platforms.



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

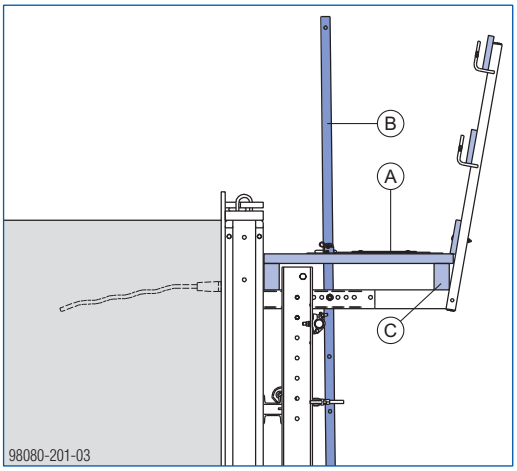
WARNING

➤ 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 platform beams, the Manhole B70/60 cm can be used.



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

NOTICE

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).

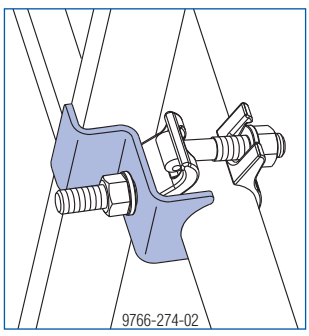
Fixing the ladders to the bracing tubes

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 Wall formwork.

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



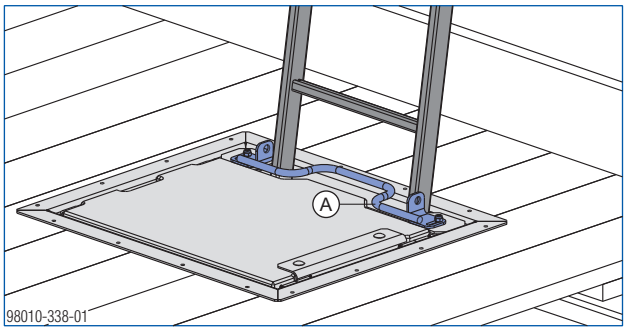
Mounting the ladders to the working platform and to the suspended platforms

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'.

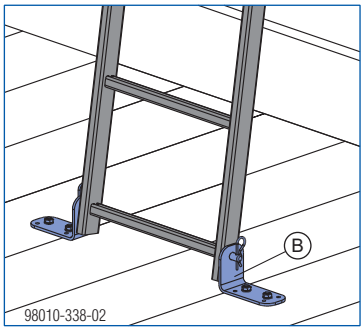
➤ Fix the System ladder XS 4.40m to the manhole with a ladder stirrup.



A Ladder bow

➤ Screw the Ladder adapter SK to the platform decking.
Threaded-fastener material required for each ladder adapter:
8 universal countersunk screws 5x50

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



B Ladder adapter SK

Manhole lid

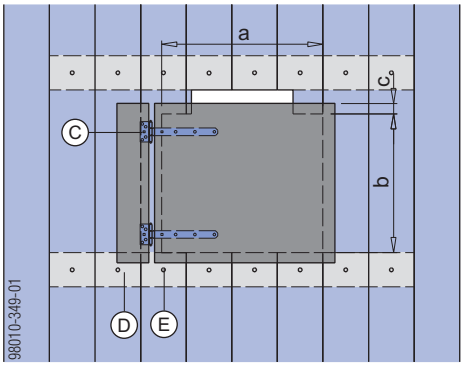
An alternative way of providing a platform manhole is to construct a hinged manhole lid.

➤ 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

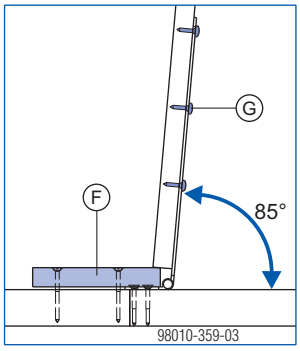
CAUTION

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.

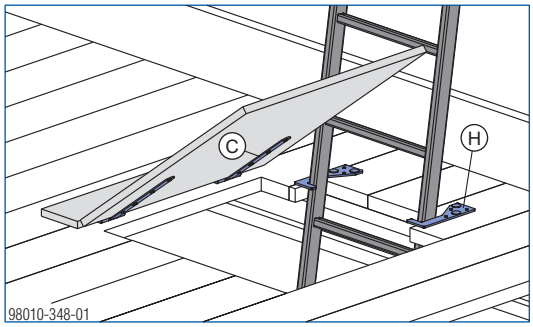


F Timber stop-bar
G Framax screw 7x22

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.

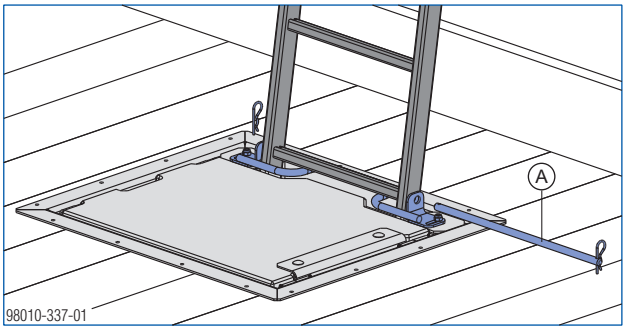
on casting-section heights of over 3.40m

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.

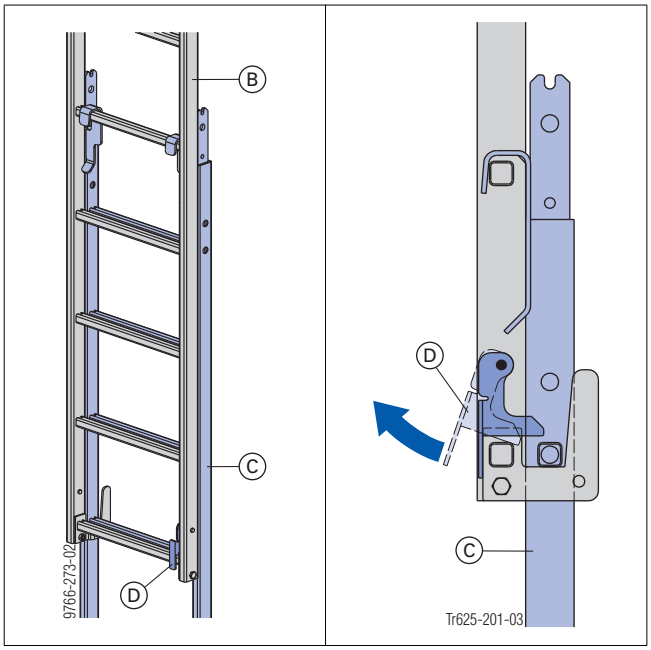


A Ladder bolt XS

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.



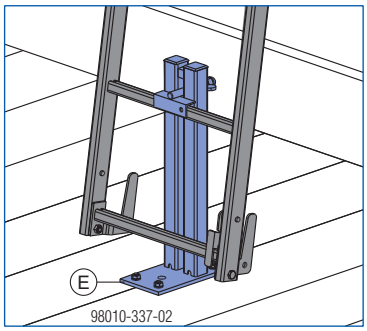
B System ladder XS 4.40m

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

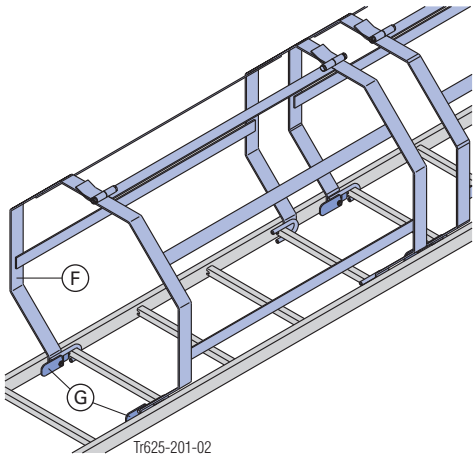
- 4 square bolts M10x70
- 4 washers A 10.5
- 4 hexagon nuts M 10

Ladder cage

NOTICE

➤ Always observe all relevant safety regulations applying to the use of the Ladder cage XS in the country in which you are operating (e.g. in Germany: BGV D 36).

➤ Fix the Ladder cage XS 1.00m 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

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:

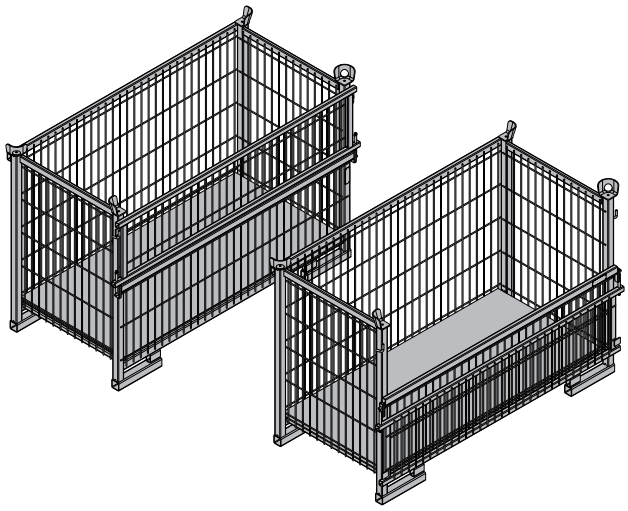
- The parts must be onloaded and off-loaded, transported and stacked in such a way that it is not possible for them to fall off, tip over or slide apart.
- Only set down the parts or assembly units on flat, firm, clean surfaces.
- Spread-angle β of slinging chains: max. 30°.
- Do not detach parts from 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 device for small items



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

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

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

Max. n° of units on top of one another

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

NOTICE

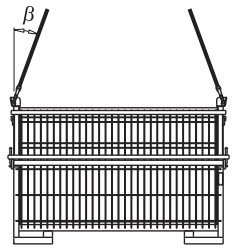
Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

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

Lifting by crane

NOTICE

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



9234-203-01

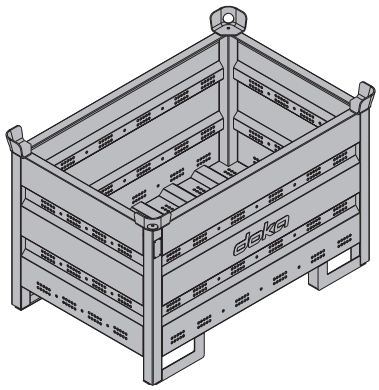
Repositioning by forklift truck or pallet stacking truck

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

Doka multi-trip transport box

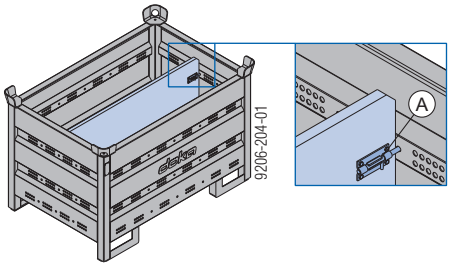
Storage and transport device for small items

Doka multi-trip transport box 1.20x0.80m



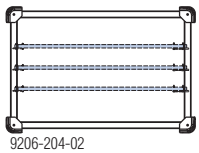
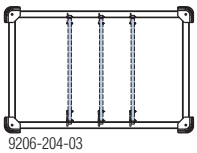
Max. carrying capacity: 1500 kg (3300 lbs)
Permitted imposed load: 7850 kg (17300 lbs)

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

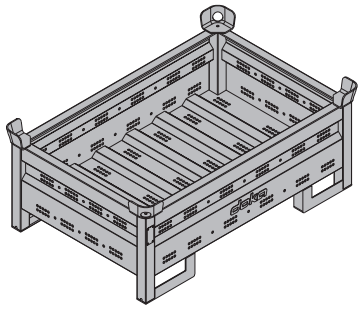


A Slide-bolt for fixing the partition

Possible ways of dividing the box

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

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



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

Using Doka multi-trip transport boxes as storage units

Max. n° of units on top of one another

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

NOTICE

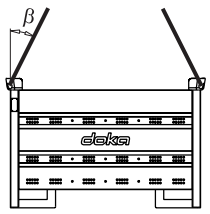
Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

Using Doka multi-trip transport boxes as transport devices

Lifting by crane

NOTICE

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



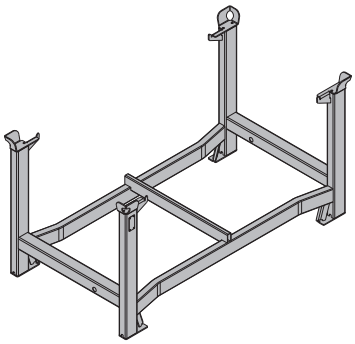
9206-202-01

Repositioning by forklift truck or pallet stacking truck

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

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

Storage and transport devices for long items.



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

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

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

NOTICE

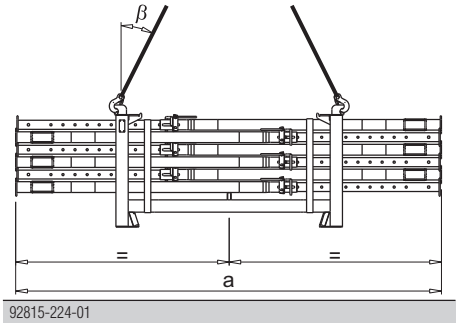
- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- **How to use with Bolt-on castor set B:**
  - Always apply the fixing brake when the container is 'parked'.
  - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with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

Using Doka stacking pallets as transport devices

Lifting by crane

NOTICE

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



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

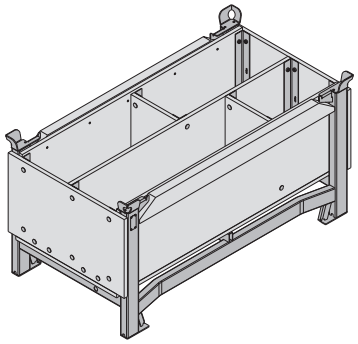
Repositioning by forklift truck or pallet stacking truck

NOTICE

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

Doka accessory box

Storage and transport device for small items



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

Doka accessory boxes as storage units

Max. n° of units on top of one another

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

NOTICE

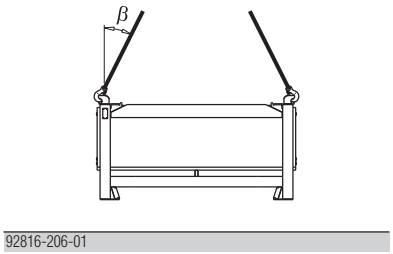
- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- **How to use with Bolt-on castor set B:**
  - Always apply the fixing brake when the container is 'parked'.
  - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with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

Doka accessory box as transport devices

Lifting by crane

NOTICE

- Multi-trip packaging items 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!
- Sling angle β max. 30°!

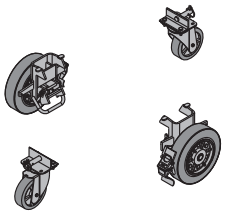


Repositioning by forklift truck or pallet stacking truck

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 device.
Suitable for drive-through access openings > 90 cm.



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

- Doka accessory box
- Doka stacking pallets
- Protective barrier Z pallet

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

	[kg]	Article N°
Cantilever bracket D22 K Sperrenkonsole D22 K Painted blue Width: 189 cm Delivery condition: railing included	**190.0**	**580610000**
Cantilever bracket D22 F Sperrenkonsole D22 F Painted blue Width: 237 cm Delivery condition: railing included	**203.0**	**580611000**
Horizontal profile D22 F Horizontalprofil D22 F Painted blue Length: 236 cm	**109.0**	**580626000**
Vertical profile D22 F Vertikalprofil D22 F Painted blue Height: 247 cm	**59.8**	**580627000**
Pressure strut D22 F Druckstrebe D22 F Painted blue Height: 268 cm	**44.0**	**580628000**
Locking plate D22 F Sicherungsplatte D22 F Powder-coated red Length: 16.2 cm Width: 15 cm	**5.2**	**580629000**
Handrail post for cantilever bracket Sperrenkonsolengeländer Painted blue Height: 144 cm	**7.9**	**500610003**
Vertical waling D22 3.00m U160 **Vertical waling D22 4.00m U160** Sperrenriegel D Painted blue	**115.5** **154.5**	**580613000** **580615000**
Spindle strut D22 3.00m Spindelstrebe D22 3,00m Painted blue Length: 215 - 258 cm	**52.6**	**580616000**
Spindle strut D22 4.00m Spindelstrebe D22 4,00m Painted blue Length: 258 - 301 cm	**55.4**	**580617000**
Swivel bearing plate D22 Gelenkaufsatz D22 Painted blue Length: 52 cm Height: 27 cm	**30.0**	**580618000**
Swivel bearing plate D22 S Gelenkaufsatz D22 S Painted blue Length: 45 cm Height: 27 cm	**26.0**	**580624000**

	[kg]	Article N°
Screw-on handrail post 1.50m Anschraubgeländer 1,50m Galvanised	**9.0**	**540451080**
Handrail clamp S Schutzgeländerzwinge S Galvanised Height: 123 - 171 cm	**11.5**	**580470000**
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**
Swivel plate MF Schwenkplatte MF Galvanised Length: 29 cm Height: 20 cm Width-across: 30 mm	**4.5**	**580672000**
Wind bracing MF/150F/K 6.00m Windabspannung MF/150F/K 6,00m Galvanised	**4.7**	**580665000**

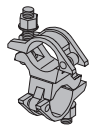
	[kg]	Article N°
Starter block unit D22 Grundblockriegel D22 Painted blue Length: 147 cm	**80.0**	**580622000**
Anchor waling 1.95m **Anchor waling 2.95m** Ankerriegel Painted blue	**76.3** **110.0**	**580545000** **580546000**
Travelling profile D22 Fahrprofil D22 Galvanised Length: 114 cm	**20.0**	**580619000**
Waling-to-bracket holder 9-24cm Riegelhalter 9-24cm Galvanised	**2.9**	**580639000**
Waling-to-bracket holder D22 Keilriegelhalter D22 Galvanised Length: 31 cm Height: 31 cm	**2.7**	**580623000**
Scaffold tube 48.3mm 0.50m	**1.7**	**682026000**
Scaffold tube 48.3mm 1.00m	**3.6**	**682014000**
Scaffold tube 48.3mm 1.50m	**5.4**	**682015000**
Scaffold tube 48.3mm 2.00m	**7.2**	**682016000**
Scaffold tube 48.3mm 2.50m	**9.0**	**682017000**
Scaffold tube 48.3mm 3.00m	**10.8**	**682018000**
Scaffold tube 48.3mm 3.50m	**12.6**	**682019000**
Scaffold tube 48.3mm 4.00m	**14.4**	**682021000**
Scaffold tube 48.3mm 4.50m	**16.2**	**682022000**
Scaffold tube 48.3mm 5.00m	**18.0**	**682023000**
Scaffold tube 48.3mm 5.50m	**19.8**	**682024000**
Scaffold tube 48.3mm 6.00m	**21.6**	**682025000**
Scaffold tube 48.3mm .....m Gerüstrohr 48,3mm Galvanised	**3.6**	**682001000**
Screw-on coupler 48mm 50	**0.84**	**682002000**
Screw-on coupler 48mm 95 Anschraubkupplung Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!	**0.88**	**586013000**

	[kg]	Article N°

Screw-on coupler 48mm 135 **0.92** **582892000**
Anschraubkupplung 48mm 135

Galvanised
Width-across: 22 mm
Follow the directions in the "Fitting instructions"!

Swivel coupler 48mm **1.5** **582560000**
Drehkupplung 48mm



Galvanised
Width-across: 22 mm
Follow the directions in the "Fitting instructions"!

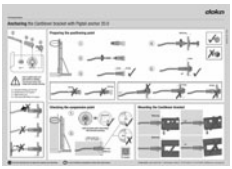
Lifting beam 110kN 6.00m **136.5** **586359000**
Umsetzbalken 110kN 6,00m

Galvanised
Length: 626 cm
Follow the directions in the "Operating Instructions"!

CE

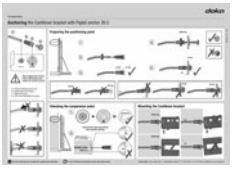
Warning sign "No entry" 300x300mm **0.70** **581575000**
Verbotsschild "Zutritt Verboten" 300x300mm

SI Cantilever br. with pigt. anch. 20.0 en-GB **1.5** **999438902**
KA Sperrenkonsole mit Wellenanker 20,0 en-GB



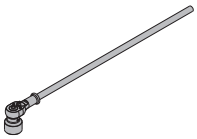
Width: 119 cm
Height: 84 cm
Short instruction

SI Cantilever br. with pigt. anch. 26.5 en-GB **1.5** **999439002**
KA Sperrenkonsole mit Wellenanker 26,5 en-GB



Width: 119 cm
Height: 84 cm
Short instruction

Ratchet MF 3/4" SW50 **5.1** **580648000**
Antriebsknarre MF 3/4" SW50

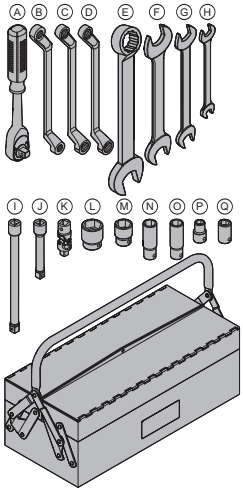


Galvanised

	[kg]	Article N°

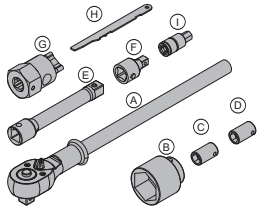
Tool box GF **7.2** **580390000**
GF-Werkzeugbox
included in scope of supply:

(A)	**Reversible ratchet 1/2"** Galvanised	**0.73**	**580580000**
(B)	**Ring spanner 13/15**	**0.25**	**580599000**
(C)	**Ring spanner 16/18**	**0.23**	**580644000**
(D)	**Ring spanner 17/19**	**0.27**	**580590000**
(E)	**Combination wrench 36**	**0.75**	**582860000**
(F)	**Fork wrench 30/32**	**0.80**	**580897000**
(G)	**Fork wrench 22/24**	**0.22**	**580587000**
(H)	**Fork wrench 13/17**	**0.08**	**580577000**
(I)	**Extension 22cm 1/2"**	**0.31**	**580582000**
(J)	**Extension 11cm 1/2"**	**0.20**	**580581000**
(K)	**Universal joint coupling 1/2"**	**0.16**	**580583000**
(L)	**Box nut 30 1/2"**	**0.20**	**580575000**
(M)	**Box nut 24 1/2"**	**0.12**	**580584000**
(N)	**Box nut 19 1/2" L**	**0.16**	**580598000**
(O)	**Box nut 18 1/2" L**	**0.15**	**580642000**
(P)	**Box nut 15 1/2"**	**0.09**	**580676000**
(Q)	**Box nut 13 1/2"**	**0.06**	**580576000**

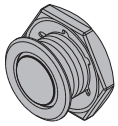


Additional tools MF **5.4** **580682000**
Zusatzwerkzeuge MF
consisting of:

(A)	**Reversible ratchet 3/4"** Galvanised	**1.5**	**580894000**
(B)	**Box nut 50 3/4"**	**0.81**	**581449000**
(C)	**Box nut 17 1/2"**	**0.07**	**580685000**
(D)	**Box nut 16 1/2"**	**0.08**	**580640000**
(E)	**Extension 20cm 3/4"**	**0.68**	**580683000**
(F)	**Transition piece A 1/2"x3/4"**	**0.18**	**580684000**
(G)	**Universal cone spanner 15.0/20.0** Galvanised Width-across: 50 mm	**0.90**	**581448000**
(H)	**Safety Ruler SK** Length: 18 cm	**0.02**	**581439000**
(I)	**Hexagon bit socket 14mm 1/2"**	**0.13**	**581583000**

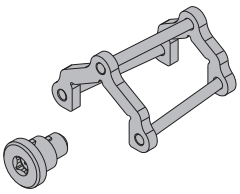


Form-ply protector 32mm **0.38** **580220000**
Schalhautschutz 32mm



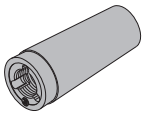
Galvanised
Width-across: 70 mm

	[kg]	Article N°
Mounting tool for form-ply protector Montagewerkzeug Schalhautschutz Galvanised	0.96	580222000

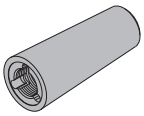


Tie rod system 20.0

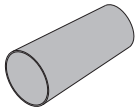
Universal climbing cone 20.0 2G Universal-Kletterkonus 20,0 2G Galvanised Green Length: 12.8 cm Diameter: 5.3 cm	1.2	581442500



Universal climbing cone 20.0 Universal-Kletterkonus 20,0 Galvanised Green Length: 12.8 cm Diameter: 5.3 cm	1.2	581442000

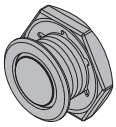


Sealing sleeve K 20.0 Dichtungshülse K 20,0 Green Length: 12 cm Diameter: 6 cm	0.03	581443000

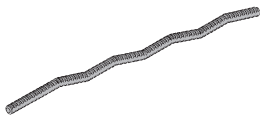


Cone screw M30 SW50 7cm Konusschraube M30 SW50 7cm Green Length: 10 cm Diameter: 7 cm Width-across: 50 mm	0.88	581444500

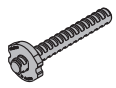
Form-ply protector 32mm Schalhautschutz 32mm Galvanised Width-across: 70 mm	0.38	580220000



Pigtail anchor 20.0 Wellenanker 20,0 Non-treated Length: 76 cm	2.0	581450000

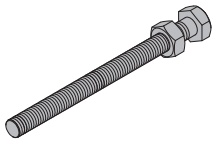


Stop anchor 20.0 C17 Sperranker 20,0 C17 Non-treated	0.62	581457000

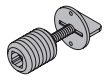


Stop anchor 20.0 C40 Sperranker 20,0 C40 Non-treated	1.2	581458000

Positioning bolt M30x380 Vorlaufschraube M30x380 Galvanised Width-across: 50 mm	3.0	581816000

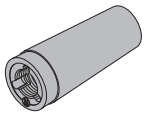


Positioning clamp M30 Vorlaufklemme M30 Galvanised Diameter: 4 cm	0.19	581833000

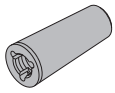


Tie rod system 26.5

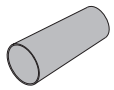
Universal climbing cone 26.5 2G Universal-Kletterkonus 26,5 2G Galvanised Blue Length: 12.8 cm Diameter: 5.3 cm	1.1	581987500



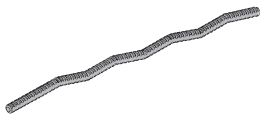
Universal climbing cone 26.5 Universal-Kletterkonus 26,5 Galvanised Blue Length: 12.8 cm Diameter: 5.3 cm	1.1	581987000



Sealing sleeve K 26.5 Dichtungshülse K 26,5 Light blue Length: 11 cm Diameter: 6 cm	0.02	581998000

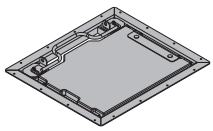


Pigtail anchor 26.5 Wellenanker 26,5 Non-treated Length: 80 cm	3.6	581900000

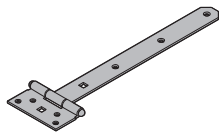


Ladder system XS

Manhole B 70/60cm Bühnendurchstieg B 70/60cm Steel parts galvanised Timber parts varnished yellow Length: 81 cm Width: 71 cm	22.0	581530000



Cover hinge SK 35cm Deckelscharnier SK 35cm Galvanised	0.30	581533000

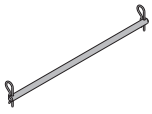


	[kg]	Article N°
System ladder XS 4.40m System-Leiter XS 4,40m Galvanised	**33.2**	**588640000**

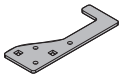
Ladder extension XS 2.30m Leiternverlängerung XS 2,30m Galvanised	**19.1**	**588641000**

Ladder clamp SK Leiternklemme SK Galvanised Length: 8 cm	**0.23**	**581239000**

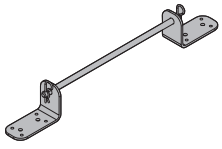
Ladder bolt XS Leiternbolzen XS Galvanised Length: 51 cm	**0.85**	**581561000**



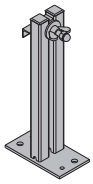
Ladder holder SK Leiternhalter SK Galvanised	**0.36**	**581532000**



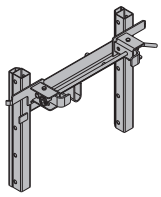
Ladder adapter SK Leiternfuß SK Galvanised	**2.3**	**581531000**



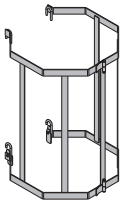
Ladder adapter XS Leiternfuß XS Galvanised Height: 50 cm	**5.0**	**588673000**



	[kg]	Article N°
Connector XS Wall formwork Anschluss XS Wandschalung Galvanised Width: 89 cm Height: 63 cm	**20.8**	**588662000**

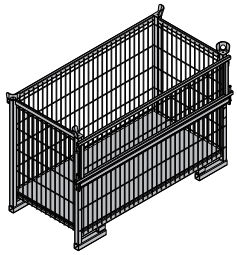


Ladder cage XS 1.00m **Ladder cage XS 0.25m** Rückenschutz XS Galvanised	**16.5** **10.5**	**588643000** **588670000**

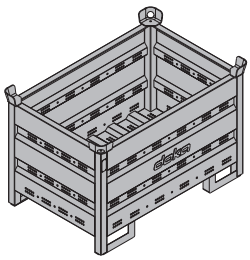


Multi-trip packaging

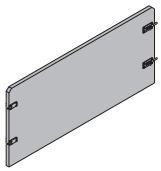
Doka skeleton transport box 1.70x0.80m Doka-Gitterbox 1,70x0,80m Galvanised Height: 113 cm	**87.0**	**583012000**



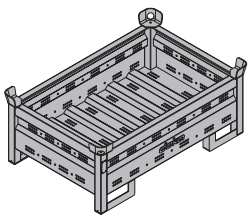
Doka multi-trip transport box 1.20x0.80m Doka-Mehrwegcontainer 1,20x0,80m Galvanised Height: 78 cm	**70.0**	**583011000**

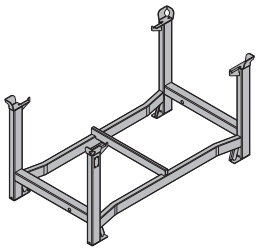
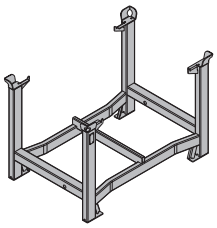
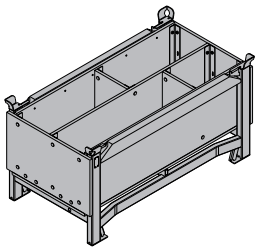
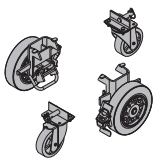


Multi-trip transport box partition 0.80m **Multi-trip transport box partition 1.20m** Mehrwegcontainer Unterteilung Steel parts galvanised Timber parts varnished yellow	**3.7** **5.5**	**583018000** **583017000**



Doka multi-trip transport box 1.20x0.80x0.41m Doka-Mehrwegcontainer 1,20x0,80x0,41m Galvanised	**42.5**	**583009000**



	[kg]	Article N°
Doka stacking pallet 1.55x0.85m Doka-Stapelpalette 1,55x0,85m Galvanised Height: 77 cm 	**41.0**	**586151000**
Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m Galvanised Height: 77 cm 	**38.0**	**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**

[kg]	Article N°

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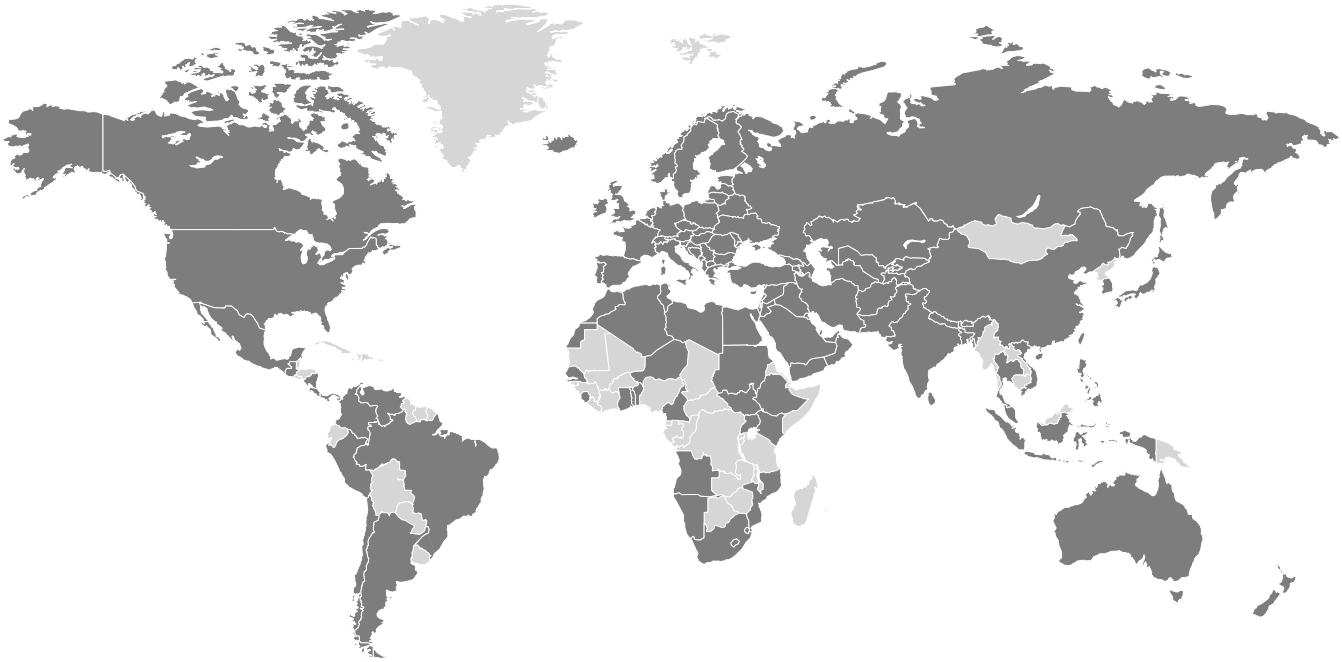

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