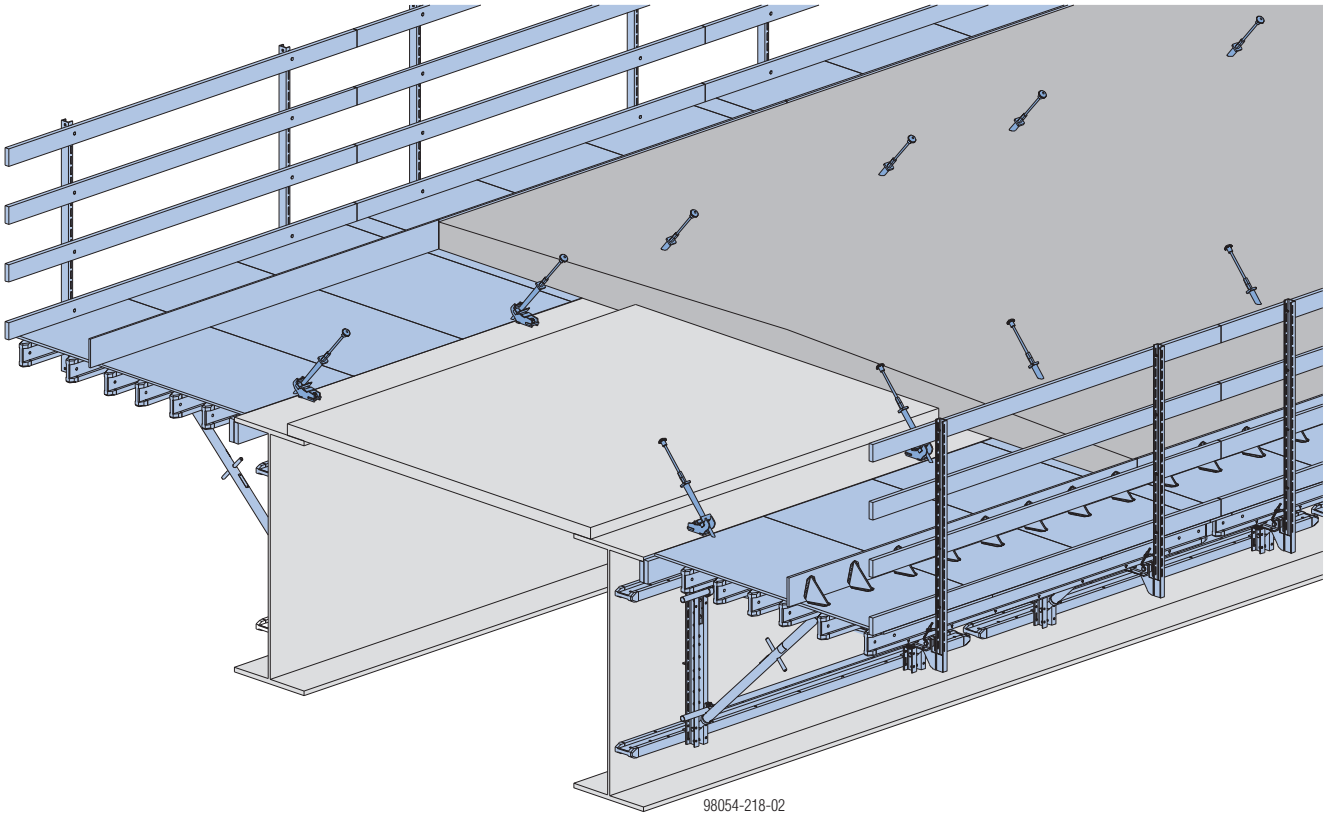
999805402 - 06/2017
en-GB

The Formwork Experts.

Bridge formwork ParaTop

User Information

Instructions for assembly and use (Method statement)




doka
Genie S-65

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

Planning

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

Regulations; industrial safety

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

Rules applying during all phases of the assignment

- The customer must ensure that this product is erected and dismantled, reset and generally used for its intended purpose in accordance with the applicable laws, standards and rules, under the direction and supervision of suitably skilled persons.
  These persons' mental and physical capacity must not in any way be impaired by alcohol, medicines or drugs.
- Doka products are technical working appliances which are intended for industrial / commercial use only, always in accordance with the respective Doka User Information booklets or other technical documentation authored by Doka.
- The stability and load-bearing capacity of all components and units must be ensured during all phases of the construction work!
- Do not step on or apply strain to cantilevers, closures, etc. until suitable measures to ensure their stability have been correctly implemented (e.g. by tie-backs).
- Strict attention to and compliance with the functional instructions, safety instructions and load specifications are required. Non-compliance can cause accidents and severe injury (risk of fatality) and considerable damage to property.
- Sources of fire in the vicinity of the formwork are prohibited. Heaters are permissible only when used correctly and situated a correspondingly safe distance from the formwork.
- Work has to be governed by the weather conditions (e.g. risk of slipping). In extreme weather conditions preventive measures must be implemented to secure the equipment and the surrounding areas and to protect the 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.
  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 suitable condition. Steps must be taken to rule out the use of any components that are damaged, deformed, or weakened due to wear, corrosion or rot.
- Combining our formwork systems with those of other manufacturers could be dangerous, risking damage to both health and property. If you intend to combine different systems, please contact Doka for advice first.
- The equipment/system must be assembled and erected in accordance with the applicable laws, Standards and rules by suitably skilled personnel of the customer's, having regard to any and all required safety inspections.
- It is not permitted to modify Doka products; any such modifications constitute a safety risk.

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 out 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 regulations applying to the handling of formwork and scaffolding. In addition, the Doka slinging means must be used - this is a mandatory requirement.
- Remove any loose parts or fix them in place so that they cannot be dislodged or fall free!
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this booklet!

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.

Symbols used

The following symbols are used in this booklet:

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

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

Instruction
This symbol indicates that actions need to be taken by the user.

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

Tip
Points out useful practical tips.

Reference
Refers to other documents and materials.

Eurocodes at Doka

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

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

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

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

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

$$E_d \leq R_d$$

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

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

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

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

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

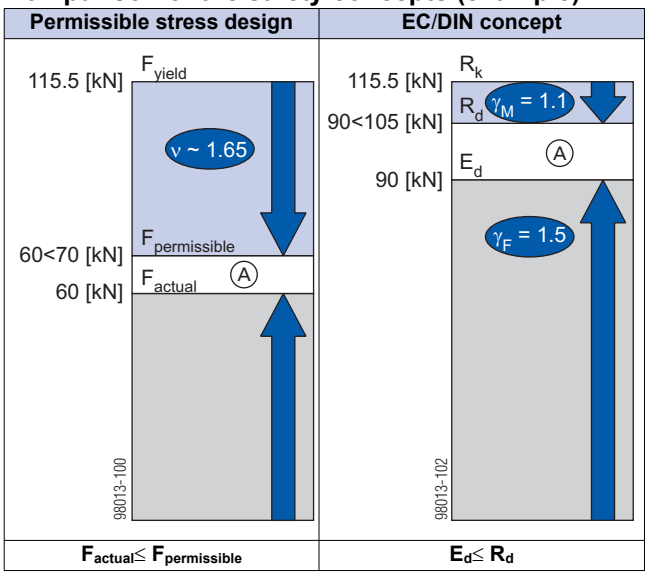
Steel: $R_d = \frac{R_k}{\gamma_M}$ Timber: $R_d = k_{mod} \cdot \frac{R_k}{\gamma_M}$

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

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

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

Comparison of the safety concepts (example)



A Utilisation factor

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

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

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

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

Doka services

Support in every stage of the project

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

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

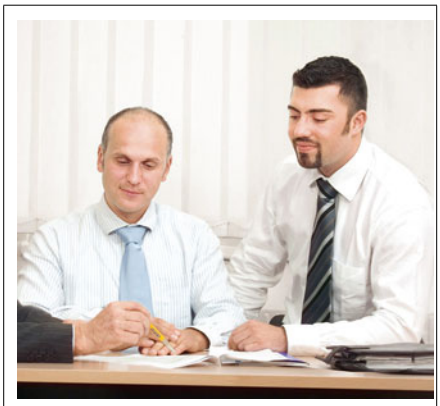
Project Development Stage

Taking well-founded decisions thanks to professional advice and consulting

Find precisely the right formwork solutions, with the aid of

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

Bidding Stage

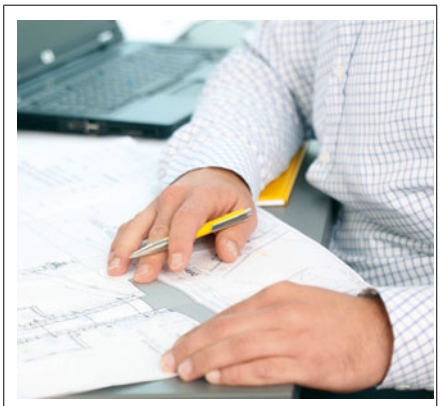


Optimising the preliminary work with Doka as an experienced partner

Draw up potentially winning bids, by

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

Operations Scheduling Stage

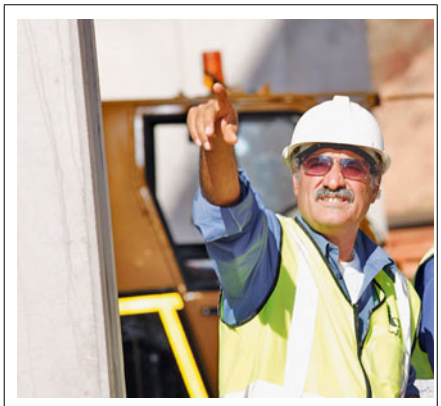


Controlled, regular forming operations, for greater efficiency resulting from realistically calculated formwork concepts

Plan cost-effectively right from the outset, thanks to

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

Concrete Construction Stage



Optimum resource utilisation
with assistance from the Doka Formwork Experts

Workflow optimisation, thanks to

- thorough utilisation planning
- internationally experienced project technicians
- appropriate transport logistics
- on-site support

Project Close-out Stage

Seeing things through to a positive conclusion
with professional support

Doka Services are a byword for transparency and efficiency here, offering

- jointly handled return of rented formwork
- professional dismantling
- efficient cleaning and reconditioning using special equipment

The advantages for you
thanks to professional advice and consulting

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

System description

Bridge formwork ParaTop - for cost-efficient, safe forming of roadway slabs

Bridge formwork ParaTop is a modular formwork system for use on steel composite bridges and pre-cast concrete bridges. The operations needed for erecting and aligning the formwork, reinforcing, pouring and striking can all be performed directly from the bridge superstructure.

Great flexibility for a broad spectrum of utilisation

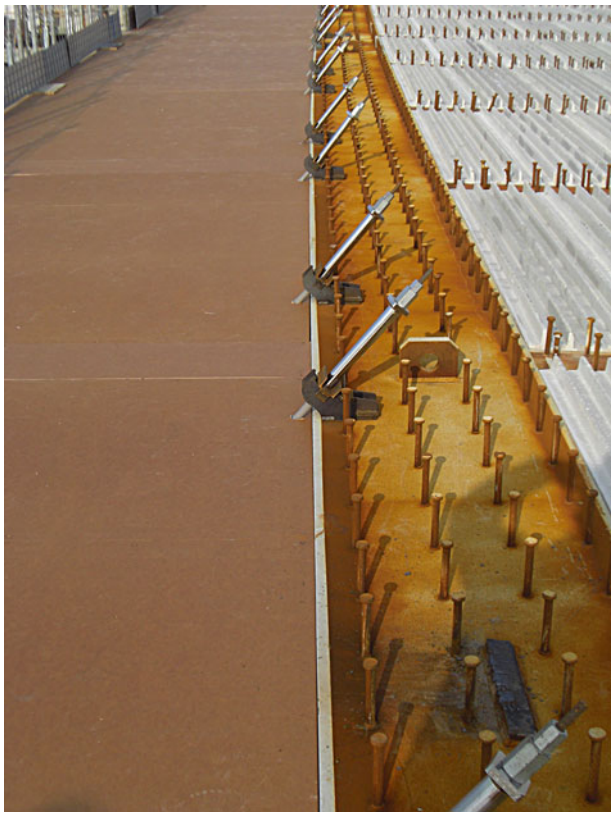
- Can be used on both pre-cast concrete members and steel girders
- Modular design concept makes it easy to adapt to many different cross-sections of roadway slab

Highly cost-efficient

- Less equipment and labour needed, thanks to the large influence widths of the suspension points
- Bolted connections for fast, accurate assembly / pre-assembly
- Utilises re-usable Top 50 system components

High safety

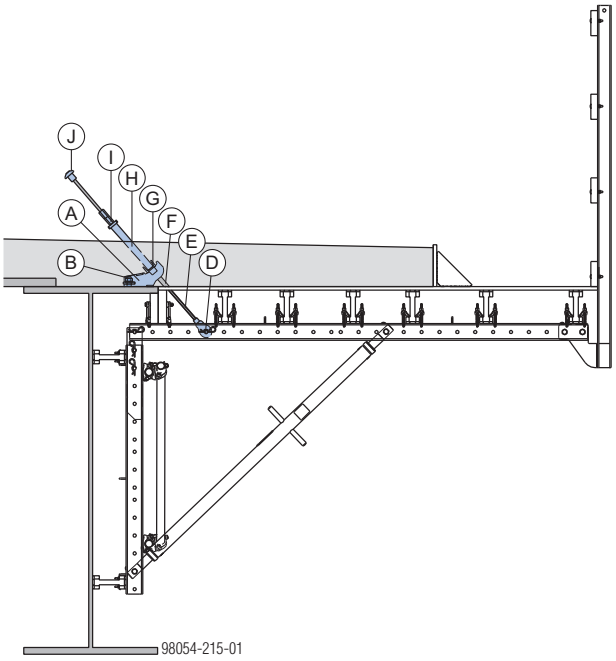
- Any type of edge protection is possible, from scaffold tubes to guard-rail boards, through the Edge protection system XP to full enclosures
- No need to access the underside of the formwork, as it can be operated from above
- The open design of the ParaTop insert-shoes allows the pre-assembled Top 50 platforms to be hung into place very quickly



System overview

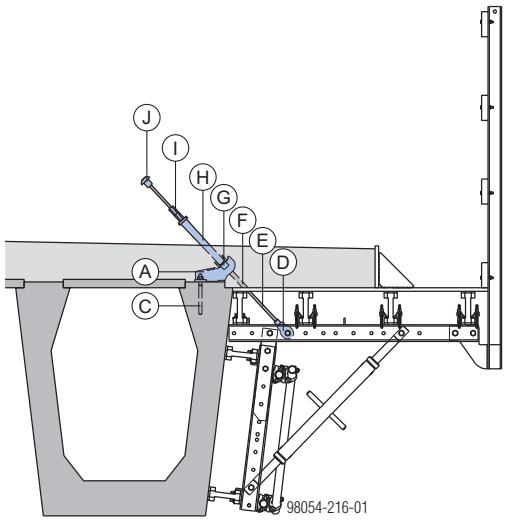
Standard solution with eye-lug tie rod anchor and ParaTop insert-cone

Used on steel girders



A ParaTop insert-shoe steel (expendable part)
B Threaded stud (expendable part)
D Eye-lug anchor 15.0 without tie rod
E Tie rod 15.0mm
F Plastic tube 22mm (expendable part)
G ParaTop insert-channel U65 (expendable part)
H ParaTop insert-cone
I Hexagon nut 15.0
J Protective cap 15.0/20.0

Used on pre-cast concrete members

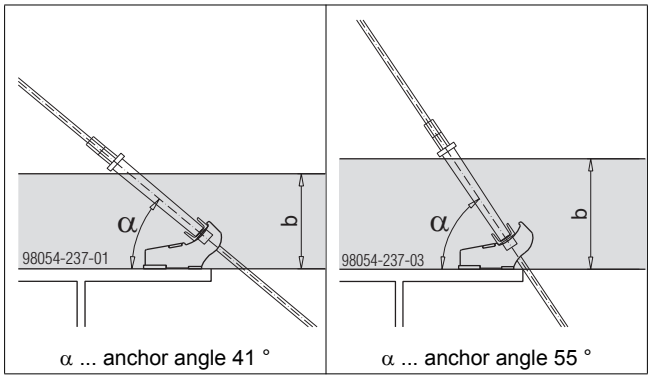


A ParaTop insert-shoe concrete (expendable part)
C Anchor-bolt (expendable part)
D Eye-lug anchor 15.0 without tie rod
E Tie rod 15.0mm
F Plastic tube 22mm (expendable part)
G ParaTop insert-channel U65 (expendable part)
H ParaTop insert-cone
I Hexagon nut 15.0
J Protective cap 15.0/20.0

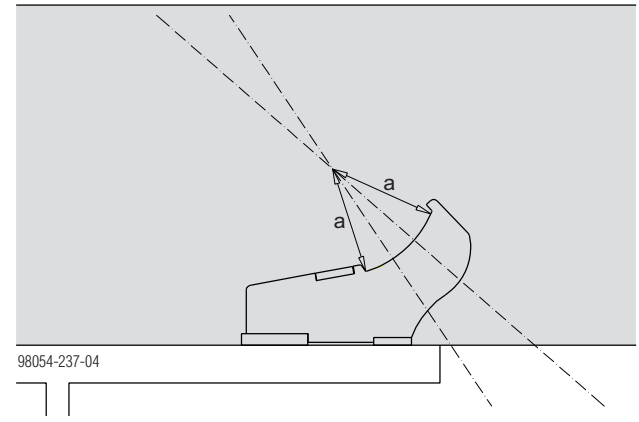
The ParaTop insert-shoe allows an anchor angle of 41°-55°. ParaTop insert-cones are available in 2 different lengths for various thicknesses of slab. The maximum possible slab thicknesses depend upon the anchor angle.

b ... max. slab thickness

	α ... anchor angle		
	41 °	45°	55 °
ParaTop insert-cone 0.35m	310 mm	325 mm	360 mm
ParaTop insert-cone 0.65m	500 mm	525 mm	600 mm



Note:
The axis of the anchor is aligned with the centre of the curved section of the ParaTop insert-shoe.

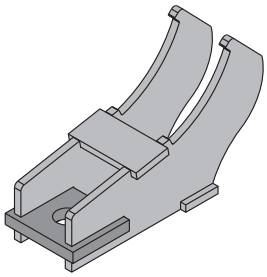


a ... 113 mm

Anchoring on the structure

Used on steel girders

ParaTop insert-shoes steel are used for suspending Top 50 platforms from steel girders.



Important note:

When creating the detailed final drawings for steel bridges, pay attention to the following places where snags may occur:

- vertical transversal braces between the top and bottom flanges
- shear-connectors on the top of the flange (if their position cannot be changed)
- varying widths and thicknesses of flange

Important note:

Do not confuse the 'ParaTop insert-shoe steel' with the 'ParaTop insert-shoe concrete'!

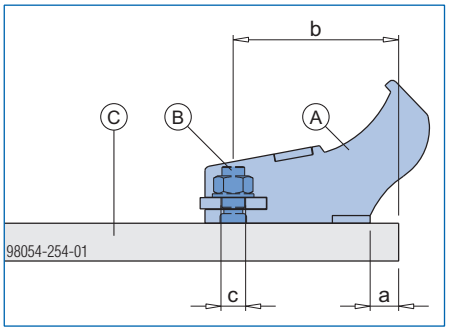
Distinguishing features of ParaTop insert-shoe steel:

- gap between anchor plate and steel girder

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

Bolting insert-shoe to threaded stud

➤ Bolt the ParaTop insert-shoe steel to the threaded stud.



a ... concrete cover (project-specific)
b ... concrete cover (a) + 145 mm
c ... dia. 26 mm hole in anchor plate

A	ParaTop insert-shoe steel
B	Threaded stud M24 (e.g. KÖCO RD M24 60 strength class 4.8, art. n° 003-0524-001)
C	Flange of the bridge girder

Required fixing materials (expendable parts)

- Washer 24
- Hexagon nut M24

Determine the required load-bearing capacity of the threaded studs separately for each project!

Follow the manufacturers' applicable fitting instructions.

Note:

To secure ParaTop insert-shoes steel, use only M24 threaded studs.

Minimum length: 60 mm

In order to weld the threaded stud on properly, a ceramic ferrule is required that is consumed during the welding-on operation.
(This item is included with the threaded stud by the suppliers KÖCO - Köster & Co. GmbH.)

Obtain and follow further information from your Doka engineer in the Competence Center Bridges!

Welding insert-shoe to bridge girder

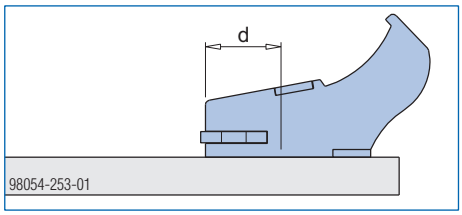
Applications:

- Load-bearing capacity of the threaded studs insufficient
- Required concrete cover not achieved, because the ParaTop insert-shoe has to be installed at the end of the bridge girder

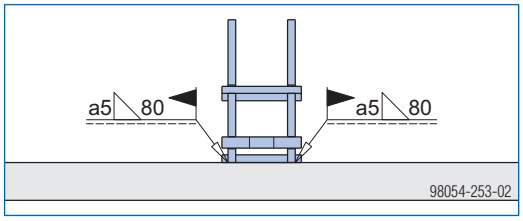
Example of welding an insert-shoe onto the girder
Boundary conditions for the example:

- Anchor load: 70 kN
- Steel grade of the steel girder: S235
- Anchor angle: 41° - 55°

(The steel grade of the ParaTop insert-shoes is S355)

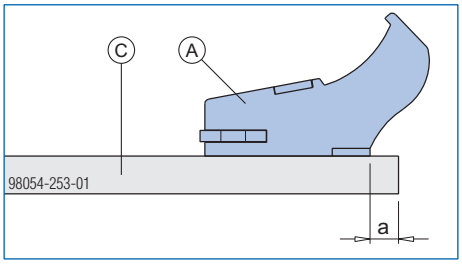


d ... length of the weld seam: 80 mm



Welding insert-shoe into position on site

CAUTION
➤ Observe all the standards and regulations applying to on-site welding work!

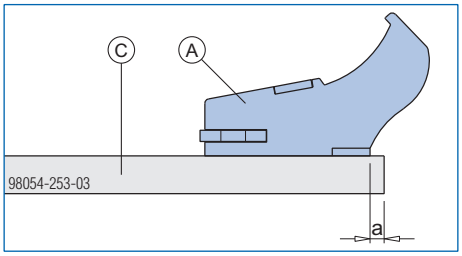


a ... concrete cover (project-specific)

A ParaTop insert-shoe steel
C Flange of the bridge girder

Welding insert-shoe into position in the steelworks

The required concrete cover does not have to be complied with if the ParaTop insert-shoes are painted along with the bridge girder. This means that the ParaTop insert-shoes have to be welded to the girder in the steelworks.



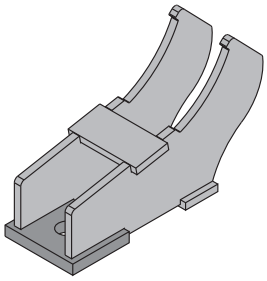
a ... concrete cover (does not have to be complied with)

A ParaTop insert-shoe steel
C Flange of the bridge girder

Note:
In countries where construction codes specify thicker concrete coverage (e.g. Central and Northern Europe), adopt this procedure by preference.

Used on pre-cast concrete members

'ParaTop insert-shoes concrete' are used for suspending Top 50 platforms from pre-cast concrete girders.



Important note:

Do not confuse the 'ParaTop insert-shoe concrete' with the 'ParaTop insert-shoe steel'!

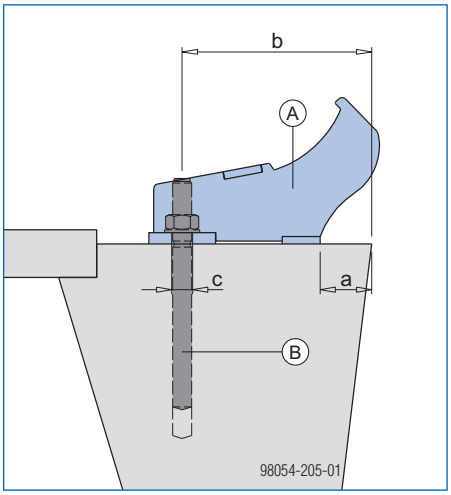
Distinguishing features of ParaTop insert-shoe concrete:

- Anchor plate sets directly on the concrete

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

Securing insert-shoe with anchor rods

➤ Anchor the 'ParaTop insert-shoe concrete' to the pre-cast concrete member.



a ... concrete cover (project-specific)
b ... concrete cover (a) + 145 mm
c ... dia. 26 mm hole in anchor plate

A	ParaTop insert-shoe concrete
B	Anchor rod for injection M24/M20 (e.g. Hilti HIT-V)

Determine the required load-bearing capacity of the anchor rods separately for each project!

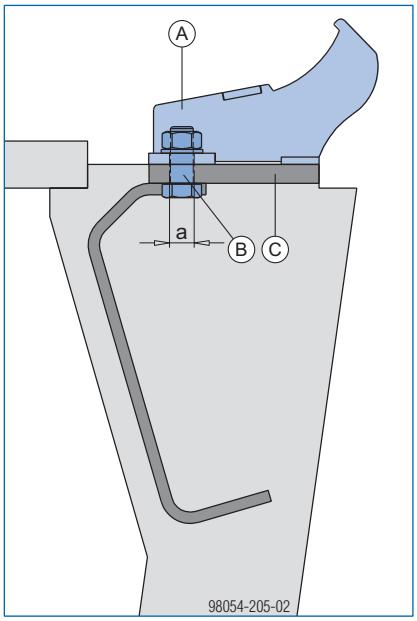
Follow the manufacturers' applicable fitting instructions.

Note:

When using a dia. 20 mm anchor rod for injection, fill the gap between anchor rod and the edge of the hole in the plate with an adhesive mortar of adequate strength.

Because the load-bearing capacity of the anchor rod on pre-cast concrete members is lower than that of the threaded stud on structural steelwork, the load-bearing capacity of the suspension point is also lower.

Securing insert-shoe to an anchor plate



a ... dia. 26 mm hole in anchor plate

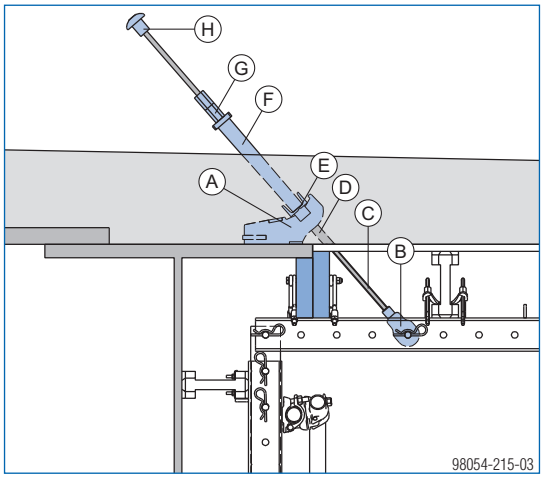
A	ParaTop insert-shoe concrete
B	Hexagon screw M24x60 8.8 DIN 933
C	Anchor plate set in concrete, with length of reinforcing bar welded on

Obtain and follow further information from your Doka engineer in the Competence Center Bridges!

Fixing options for securing the Top 50 platform to the insert-shoe

Note:
These illustrations show the fixing options with a steel girder by way of example. With the ParaTop insert-shoe concrete these solutions can also be used in the same way for securing to concrete precastings.

Standard solution with eye-lug tie rod anchor and ParaTop insert-cone



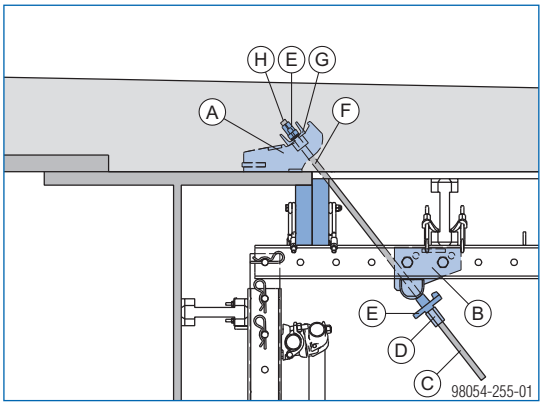
A	ParaTop insert-shoe steel (expendable part)
B	Eye-lug anchor 15.0 without tie rod
C	Tie rod 15.0mm
D	Plastic tube 22mm (expendable part)
E	ParaTop insert-channel U65 (expendable part)
F	ParaTop insert-cone
G	Hexagon nut 15.0
H	Protective cap 15.0/20.0

Project-specific suspension points

Suspension points flush with the roadway slab

Operation of the suspension point from below

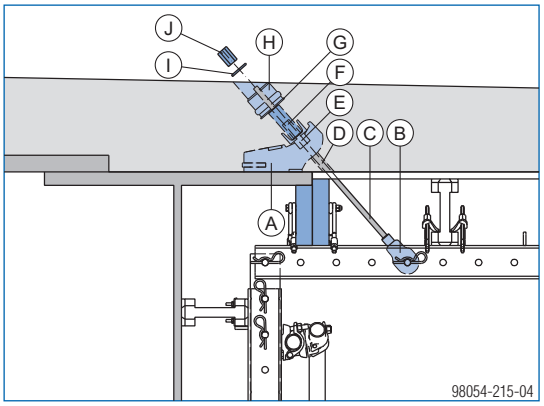
- No parts protruding above the roadway slab
- The surface of the concrete can be screeded with a full-width vibrator plate
- The suspension point has to be disassembled from below



A	ParaTop insert-shoe steel (expendable part)
B	Universal angle tie bracket
C	Tie rod 15.0mm
D	Hexagon nut 15.0
E	Wing nut 15.0
F	Plastic tube 22mm (expendable part)
G	ParaTop insert-channel U65 (expendable part)
H	Tape wrapping round the tie rod as protection against the concrete

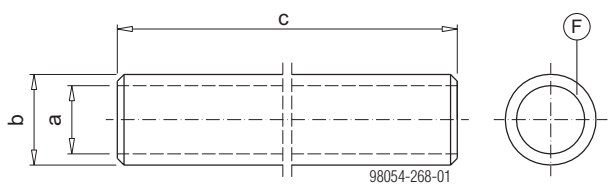
Operation of the suspension point from above

- No parts protruding above the roadway slab
- The surface of the concrete can be screeded with a full-width vibrator plate
- The suspension point can be operated from the supporting structure.



A	ParaTop insert-shoe steel (expendable part)
B	Eye-lug anchor 15.0 without tie rod
C	Tie rod 15.0mm
D	Plastic tube 22mm (expendable part)
E	ParaTop insert-channel U65 (expendable part)
F	ParaTop insert-tube 40x5 (custom component, expendable part)
G	Cap, dia. 75 mm HTEM DN75x1.9 (site-provided, expendable part)
H	Pipe, dia. 75 mm HTEM DN75x1.9 (site-provided, expendable part)
I	Washer ISO 7094 - 16 - 100 HV galvanised
J	Hexagon nut 15.0

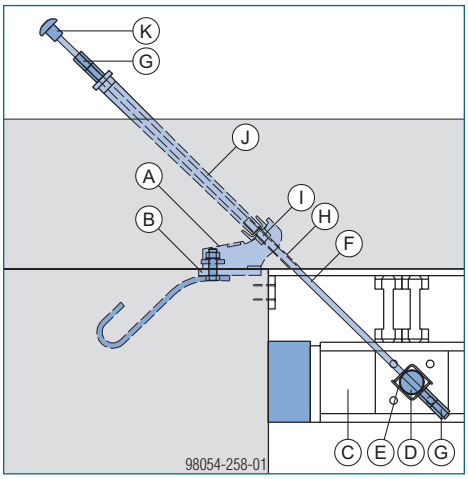
ParaTop insert-tube 40x5



a ... dia. 30 mm
b ... dia. 40 mm
c ... length, project-specific

F	Pipe 40x5 S355 DIN EN 10210 (ID number 010464)

Suspension for small frame structures



A	ParaTop insert-shoe steel (expendable part)
B	Anchor plate with length of reinforcing bar (site-provided)
C	System beam SL-1
D	Bracing bolt SL-1
E	Distance piece SL-1
F	Tie rod 15.0mm
G	Hexagon nut 15.0
H	Plastic tube 22mm (expendable part)
I	ParaTop insert-channel U65 (expendable part)
J	ParaTop insert-cone
K	Protective cap 15.0/20.0

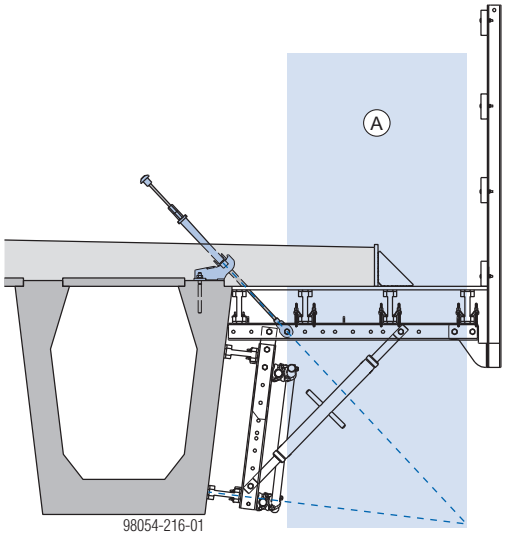
Obtain and follow further information from your Doka engineer in the Competence Center Bridges!

Anchor plate, installed condition:

Structural design

Important note:

- The structural design shown here only applies if the load centre is situated inside the zone marked 'A'.
- The Top 50 system components (Multi-purpose walings WS10, spindle struts) and the railings must be verified for each project separately.



A Permitted zone for the load centre

The following load situations must be allowed for:

- live load only
- full load
- storm winds (without live load)

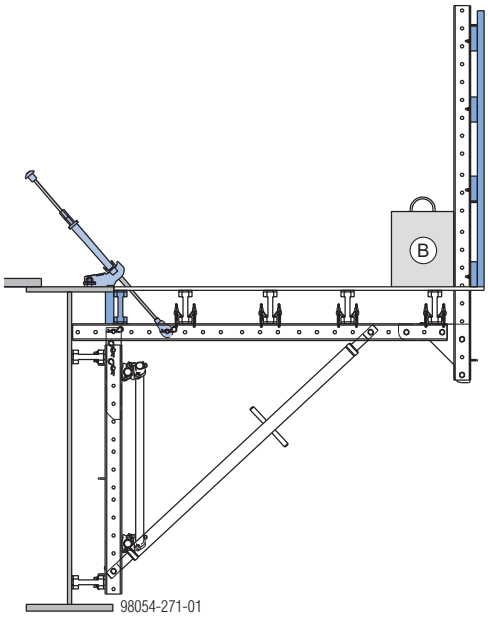
Important note:

As a general rule, a separate statics test is necessary for the load case 'storm winds (without live load)'!

CAUTION

Risk of the Top 50 platforms being lifted by **high-velocity winds**, particularly if the platforms are carrying railings with full enclosures.

➤ Check whether a ballast weight is needed to secure the empty Top 50 platform in storm winds.



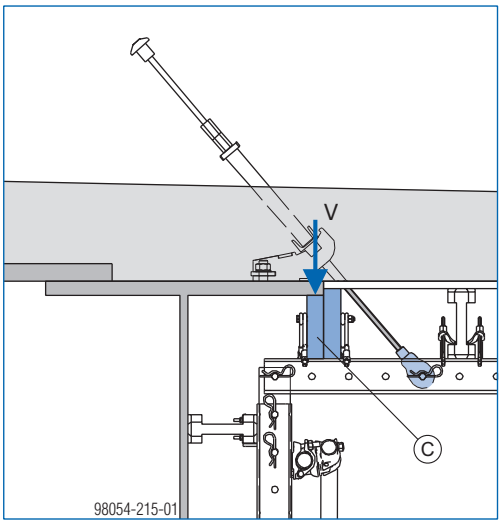
B Ballast weight

What to do if the load centre is situated outside Zone 'A':

- Provide a vertical support that the Top 50 platform can be braced against.
- Consult the responsible Statical Calculation Dept. at Doka to determine the project-specific anchor load.

It is possible to enlarge Zone 'A' by using a smaller anchor angle.

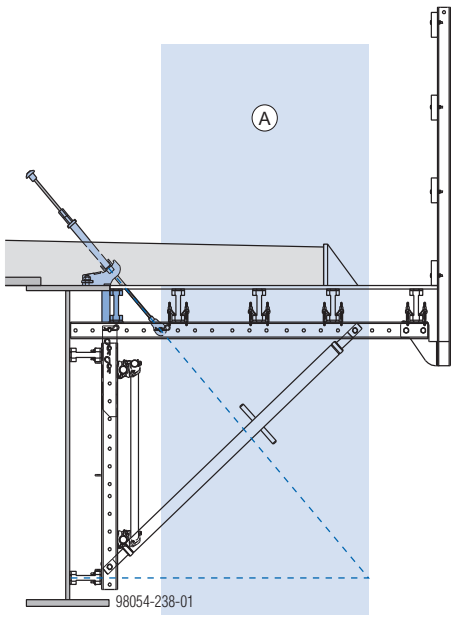
Note:
Smaller anchor angles lead to higher anchor loads.



C Vertical support

If possible, also provide vertical supports on platforms where the load centre is situated inside Zone 'A'.

This makes it easier to pull tight the joint between the main beam and the Top 50 platform.



Determining the anchoring forces

Important note:

The structural design shown here only applies if the load centre is situated inside Zone 'A' (see the section headed 'Structural design').

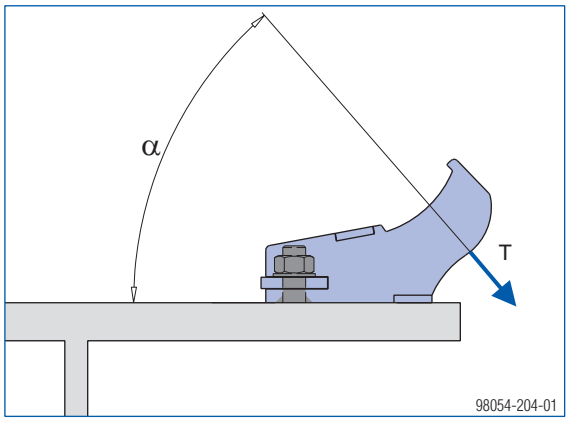
➤ Calculate vertical load (concrete load, self-weight load, live load).

➤ Determine the factor, as a function of the anchor angle.

α ... anchor angle	Factor
41.00°	1.52
42.50°	1.48
43.75°	1.45
45.00°	1.41
46.25°	1.38
47.50°	1.36
48.75°	1.33
50.00°	1.31
51.25°	1.28
52.50°	1.26
53.75°	1.24
55.00°	1.22

If an intermediate value is obtained, use factor for the smaller anchor angle.

➤ Determine the anchor load.
Anchor load 'T' = vertical load x factor



α ... 41° - 55°

➤ Depending on the anchor load, use the relevant curve **(A)** to **(I)** in the 'Diagrams for determining the anchoring forces on the ParaTop insert-shoe'.

	Anchor load [kN]								
	30	35	40	45	50	55	60	65	70
Curve	**(A)**	**(B)**	**(C)**	**(D)**	**(E)**	**(F)**	**(G)**	**(H)**	**(I)**

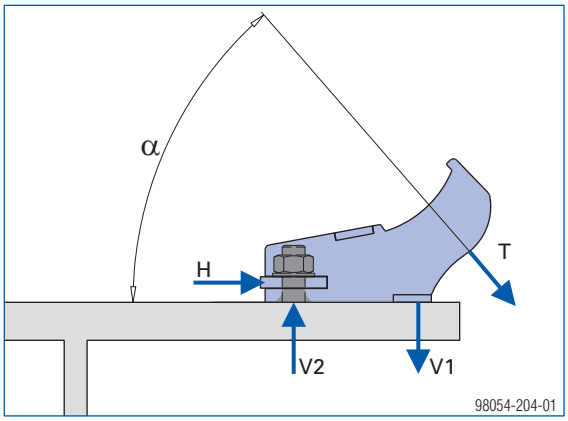
T ... permissible anchor load: 70 kN

Note:

When using threaded studs, the permitted horizontal load is limited to 45 kN.

Precondition:
The component to which the studs are welded must be made of min. S 355-grade steel.

➤ Determine the anchoring forces H, V2 and V1 from the 'Diagrams for determining the anchoring forces'.

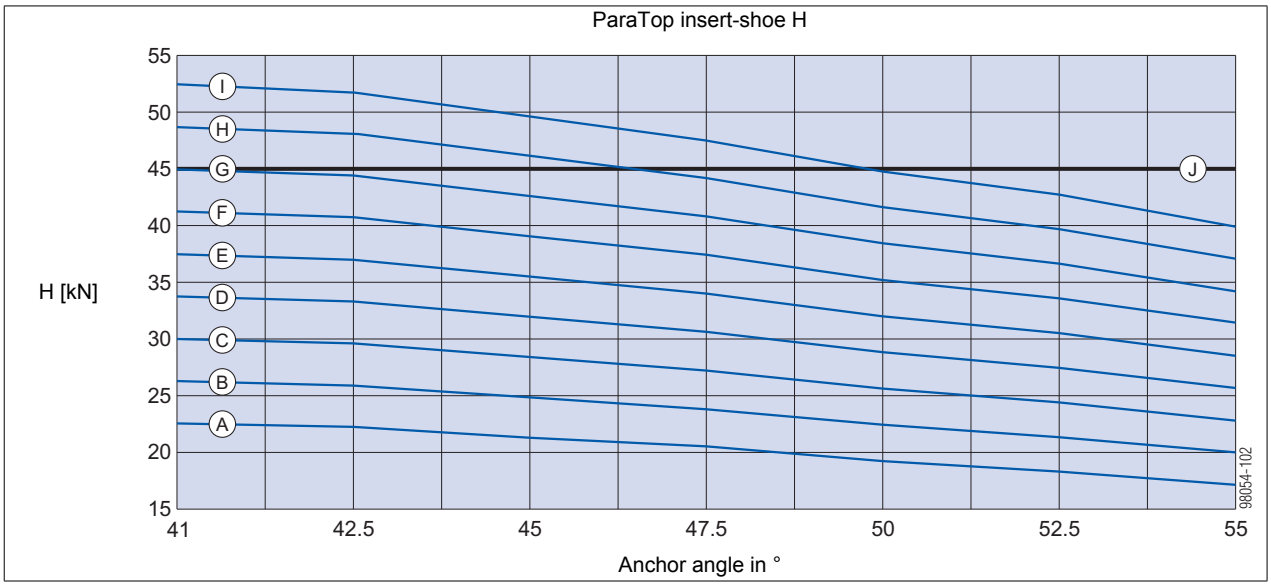


α ... 41° - 55°

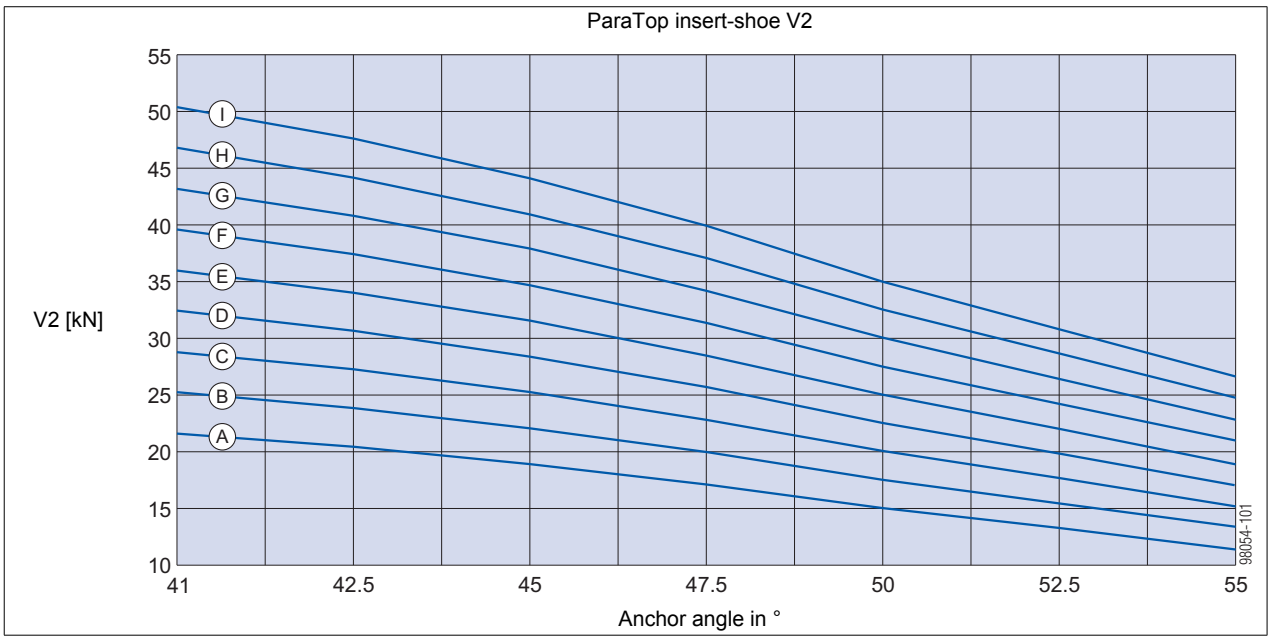
Example

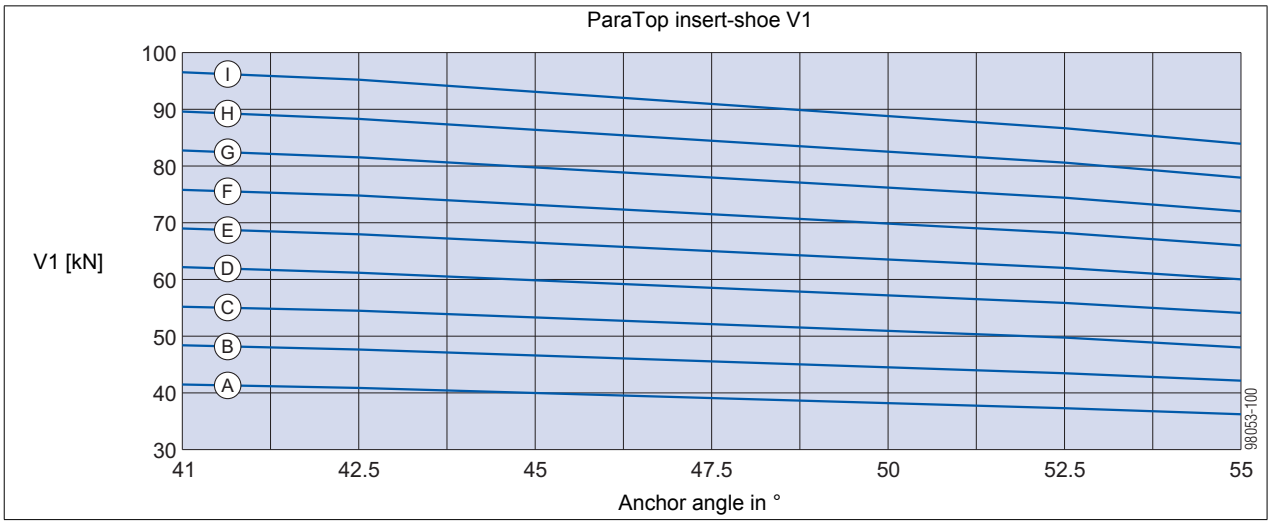
- Basic data:
  - Curve **(G)** (anchor load = 60 kN)
  - anchor angle: 47.5°
- Result:
  - H = 41 kN
  - V2 = 34 kN
  - V1 = 78 kN

Diagrams for determining the anchoring forces on the ParaTop insert-shoe

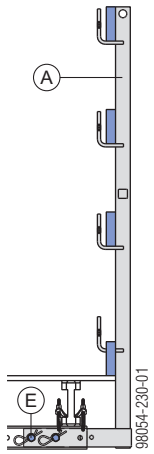
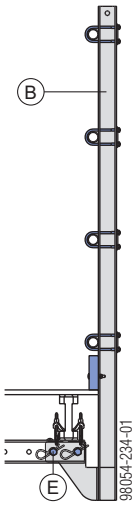
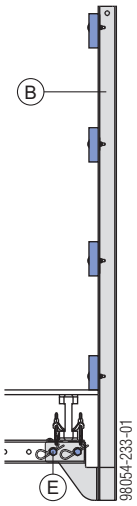
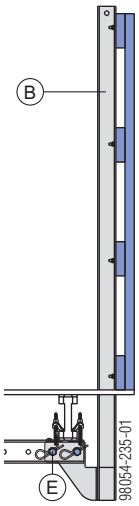
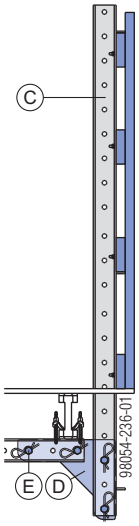


J Permissible horizontal load for threaded stud: max. 45 kN (e.g. KÖCO RD M24 60 strength class 4.8 / Köco K800 PD M20x55)





Max. influence width per handrail-post upright

	Handrail post T 1.80m		**Universal railing SK 2.00m**				**Multi-purpose waling WS 10 with Corner connecting plate SK**
	Guard-rail board		Scaffold tube	Guard-rail board		Full-area enclosure	Full-area enclosure
Dynamic pressure $q_{(ze)}$							
	Height of guard-rail boards:			Height of guard-rail boards:			
	≤15 cm	≤20 cm		≤15 cm	≤20 cm		
≤ 1.1 kN/m²	1.83 m	1.33 m	5.0 m	3.5 m	3.1 m	1.3 m	3.5 m
≤ 1.3 kN/m²	1.55 m	1.13 m	5.0 m	3.4 m	2.6 m	1.1 m	3.0 m
≤ 1.7 kN/m²	1.18 m	0.86 m	5.0 m	2.6 m	2.0 m	0.8 m	2.3 m

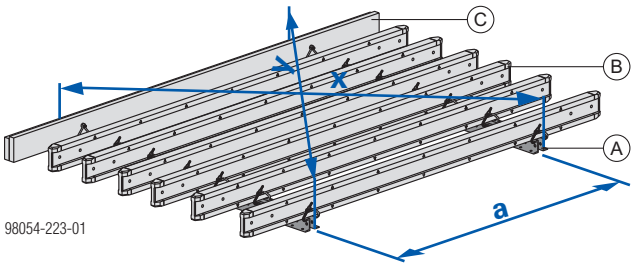
A Handrail post T 1.80m
B Universal railing SK 2.00m
C Multi-purpose waling WS10 Top50 2.25m
D Corner connecting plate SK
E Connecting pin 10cm + Spring cotter 5mm

Edge protection system XP can also be used as an alternative to the railings illustrated above (see the section headed 'Assembly').

Assembly

Pre-assembling the Top 50 platform

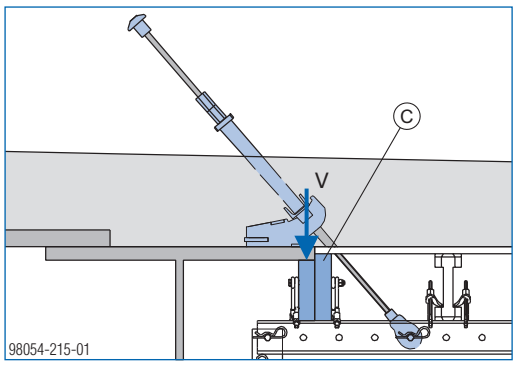
➤ Lay down Multi-purpose walings WS10, spaced apart by the exact centre-to-centre distance.



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

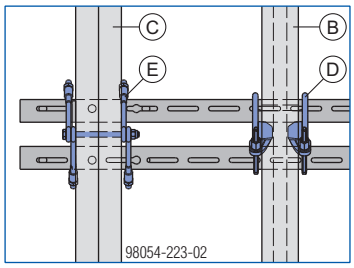
A	Multi-purpose waling WS10 Top50
B	Doka beam H20
C	Squared timbers

➤ Use squared timbers to adapt the Top 50 platform to the steel girder.



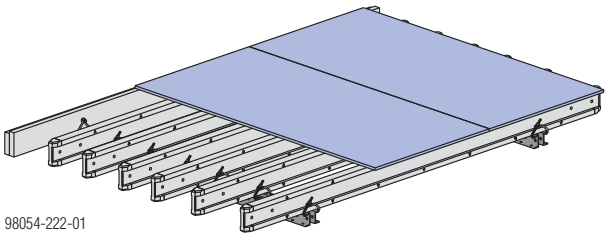
C	Squared timbers

➤ Mount Doka beams H20 and squared timbers to the Multi-purpose walings WS10.



B	Doka beam H20
C	Squared timbers
D	Flange clamp H20
E	Flange claw

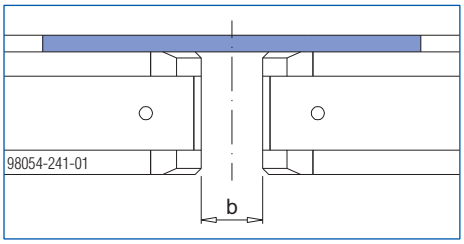
➤ Fasten formwork sheets to the Doka beams with universal countersunk screws 6x60.



Do a sight-check to make sure that the formwork sheets have been fixed properly!

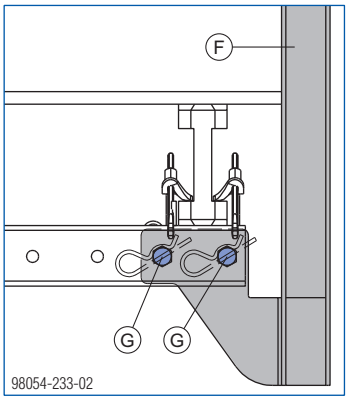
The sheet-covered area must be slightly shorter than the overall width of the platform.

The gap between two Top 50 platforms can later be closed with a fitting-board.



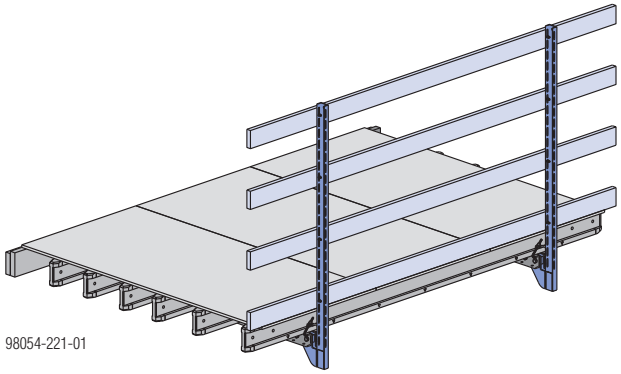
b ... approx. 100 mm

➤ Pin the Universal railings into the Multi-purpose walings WS10 with Connecting pins 10cm and secure these with Spring cotters 5mm.



F	Universal railing SK 2.00m
G	Connecting pin 10cm + Spring cotter 5mm

➤ Fasten guard-rail boards to the Universal railings SK 2.00m.



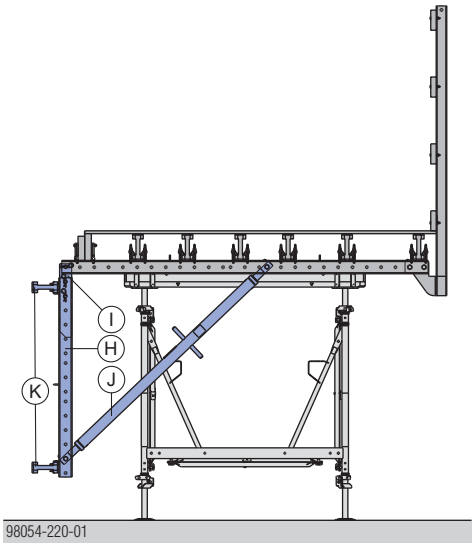
➤ Place the Top 50 platform on a temporary support.

➤ Bolt a 'Formwork element connector' to the vertical Multi-purpose waling WS10 with Connecting pins 10cm, and secure these with Spring cotters 5mm.

➤ Pin the spindle strut to the Multi-purpose walings WS10 with Connecting pins 10cm, and secure these with Spring cotters 5mm.

➤ Adjust the spindle strut to the length shown in the shop drawing / assembly plan.

➤ Mount Doka beams H20 to the vertical Multi-purpose walings WS10.



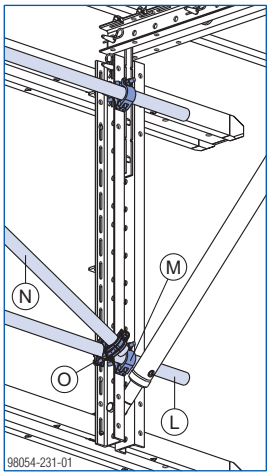
H Multi-purpose waling WS10 Top50

I Formwork element connector FF20/50 Z / Splice plate SKE50 plus

J Spindle strut T7

K Doka beam H20

➤ Brace the vertical Multi-purpose walings in the horizontal and the diagonal.



L Scaffold tube 48.3mm (horizontal)

M Screw-on coupler 48mm 50

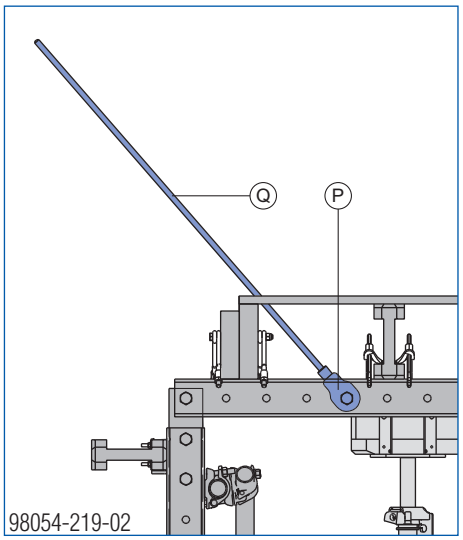
N Scaffold tube 48.3mm (diagonal)

O Swivel coupler 48mm

Distance between swivel coupler and screw-on coupler: max. 160 mm.

➤ Screw the tie rod all the way into the eye-lug anchor.

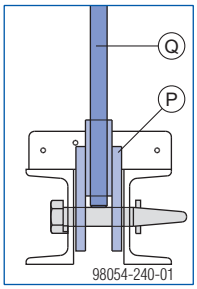
➤ Bolt the eye-lug anchor to the Multi-purpose waling with a Connecting pin 10cm and secure this with a Spring cotter 5mm (position as shown in shop drawing / assembly plan).



P Eye-lug anchor 15.0 without tie rod

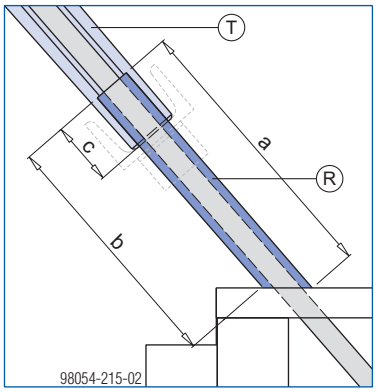
Q Tie rod 15.0mm

The tie rod must be resting against the Connecting pin.



➤ Cut a plastic tube to length at the angle shown in the shop drawing / assembly plan.
The ParaTop insert-cone is drilled open down to a depth of 45 mm so that the plastic tube can be inserted.
The plastic tube must push up against the bottom of this drilled opening, so that its other end is pressed down tightly against the form-facing during assembly.

➤ Push the plastic tube onto the tie rod.



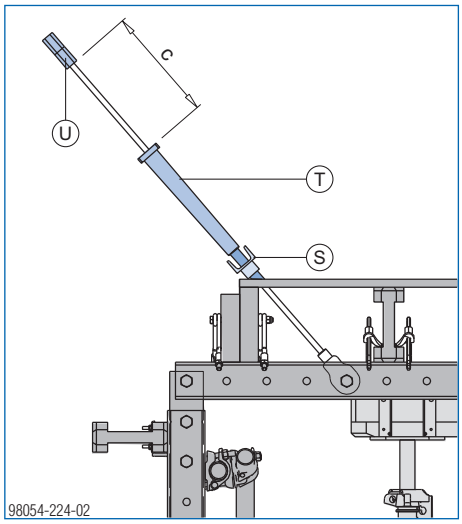
a, b... project-dependent
c ... 45 mm

R	Plastic tube 22mm
T	ParaTop insert-cone 0.35m

➤ Push the ParaTop insert-channel onto the tie rod.

➤ Push the ParaTop insert-cone onto the tie rod.

➤ Screw two Hexagon nuts 15.0 onto the tie rod.

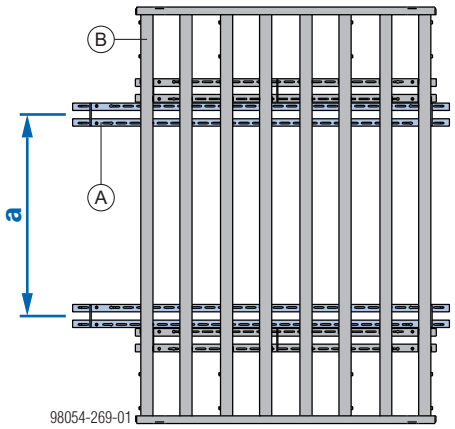


c ... approx. 120 mm

S	ParaTop insert-channel U65 (expendable part)
T	ParaTop insert-cone 0.35m
U	Hexagon nut 15.0

Pre-assembling platform with Formwork elements FF20

➤ Lay down Multi-purpose walings WS10, spaced apart by the exact centre-to-centre distance.

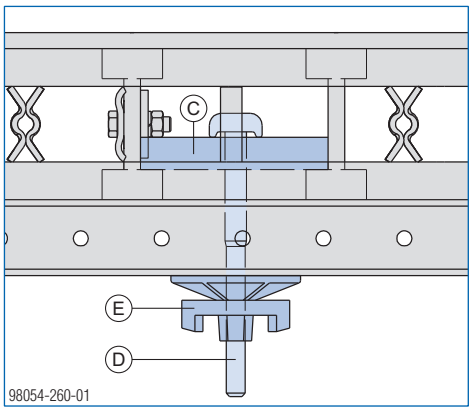


a ... centre-to-centre distance

A	Multi-purpose waling WS10 Top50
B	Formwork element FF20 2.00x2.75m (without form-facing)

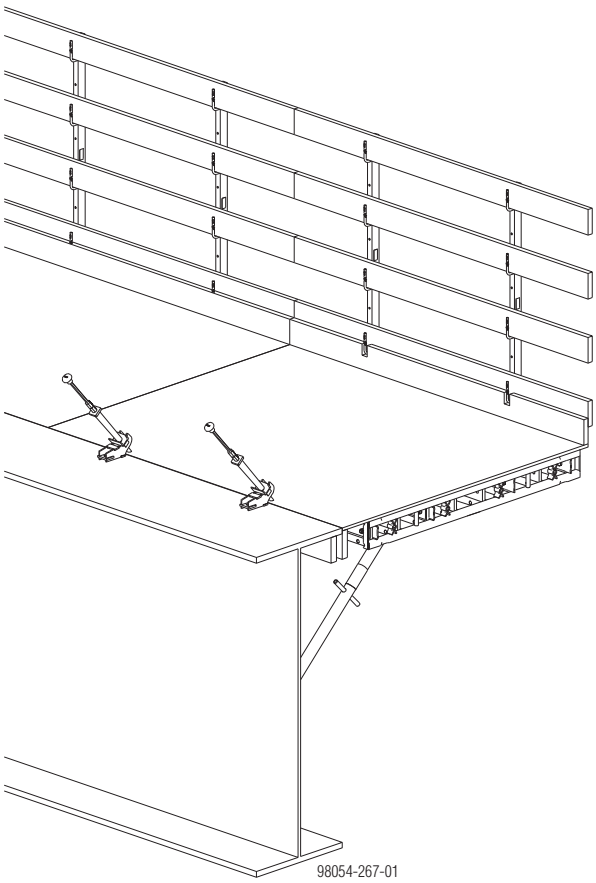
➤ Secure the Formwork element FF20 to the Multi-purpose walings WS10.

Clamping connection



C	Plank
D	Framax universal fixing bolt 10-16cm
E	Super plate 15.0

Note:
From this point on, the procedure for pre-assembling the platform is the same as that for the Top 50 platform.



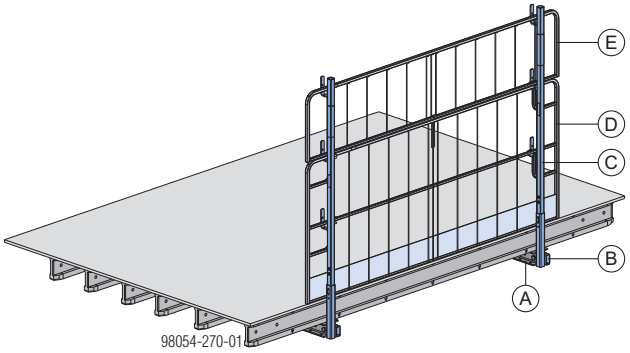
Edge protection system XP

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

Insertion adapter XP

The **Insertion adapter XP** is used in combination with the Handrail post XP, for erecting safety barriers on multi-purpose walings.

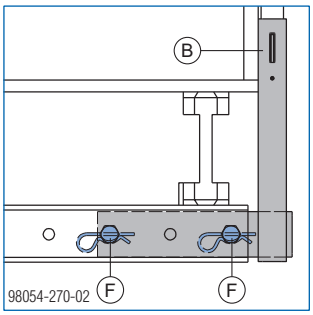
- Suitable for railing-heights of 1.20 m and 1.80 m.



A Multi-purpose waling WS10 Top50
B Insertion adapter XP
C Handrail post XP
D Protective grating XP 2.70x1.20m
E Protective grating XP 2.70x0.60m

Assembly:

➤ Attach the Insertion adapter XP to the multi-purpose waling with 2 Connecting pins 10cm and secure each of these with a Spring cotter 5mm.



B Insertion adapter XP
F Connecting pin 10cm + Spring cotter 5mm

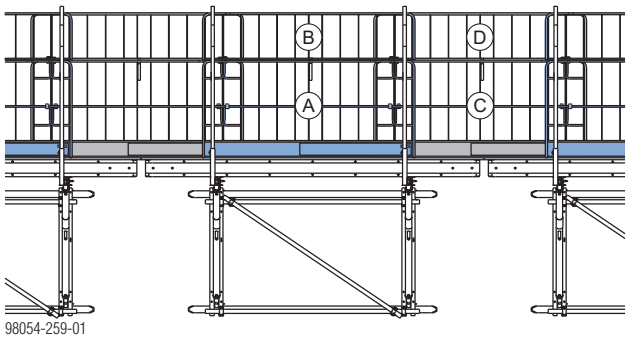
➤ Working from below, push the Toeboard holder XP 1.20m onto the Handrail post XP 1.80m (not needed when using the Protective grating XP).

➤ Push the Handrail post XP into the post-holding fixture on the Insertion adapter XP until the locking mechanism engages.

The locking mechanism must engage.

➤ Fit on a Protective grating XP or guard-rail boards, and fix them in place.

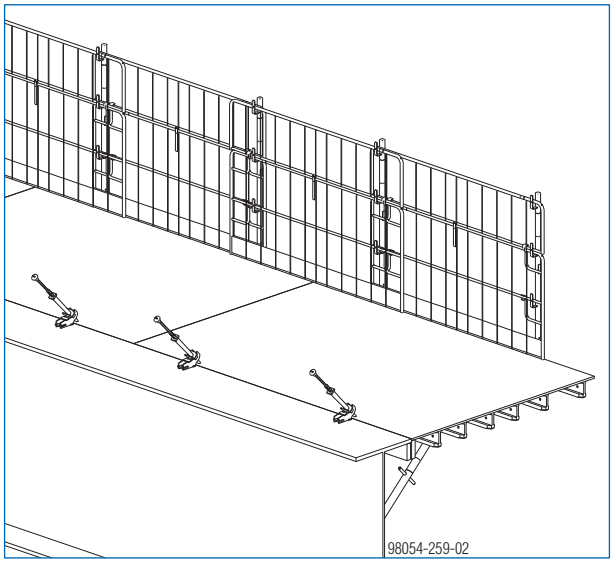
Structural design



A Protective grating XP 2.50x1.20m
B Protective grating XP 2.50x0.60m
C Protective grating XP 2.00x1.20m
D Protective grating XP 2.00x0.60m

Dynamic pressure q [kN/m²]	Permissible influence width 'e' [m]				
	Protective gratings XP 2.70x1.20m and 2.70x0.60m	Guard-rail boards			
		2.4 x 15 cm	3 x 15 cm	4 x 15 cm	Scaffold tubes 48.3mm [1]
0.2	2.5	1.9	2.7	3.6	5.0
0.6		1.9	2.7	2.8	5.0
1.1		1.5	1.5	1.5	2.8
1.3		1.2	1.2	1.2	2.4

[1] Toeboard 5 x 43 cm required



Starting up

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

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

➤ Follow the shop drawing / assembly plan.

Important note:

- A hard, flat, firm surface is needed!
- Prepare a sufficiently large assembly area.
- Tightening torque of the couplers for the bracing tubes: 50 Nm
- During all assembly and dismantling work on the Bridge formwork ParaTop that is carried out on the structure itself, the operators must use fall-arrest equipment (e.g. the Doka personal fall-arrest set).

Fixing the Top 50 platform to the insert-shoes

General instructions on repositioning

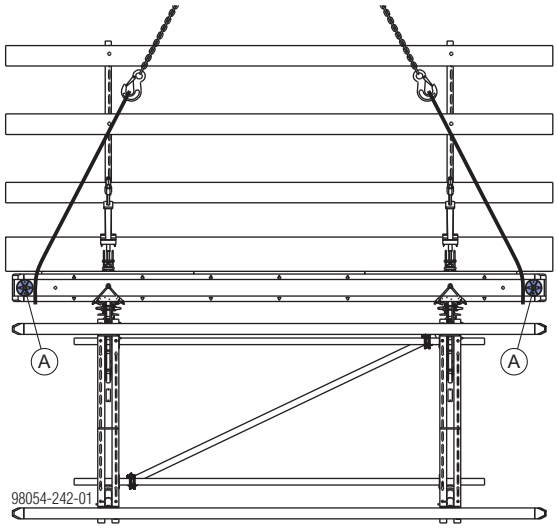
Important note:

- **Before lifting:** Remove any loose items from the formwork and platforms, or secure them firmly.
- 'Passenger transportation' is forbidden!
- Use lifting slings with sufficient carrying capacity.
- It is only possible to attach the lifting slings if the Doka beams project sufficiently far beyond the sheet-covered area.

Mounting to the structure:

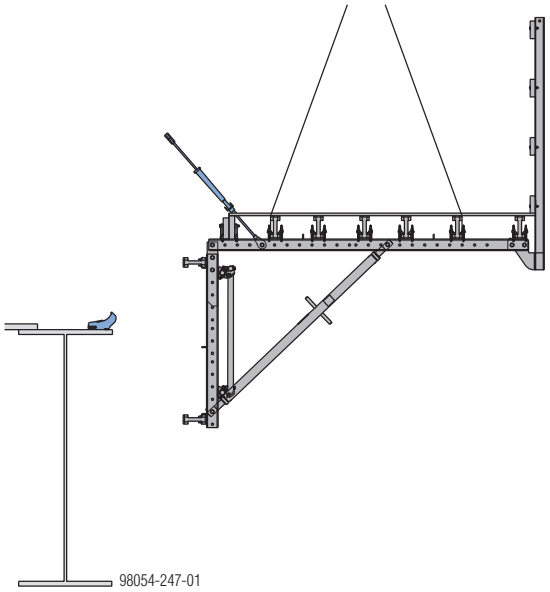
➤ Attach the Top 50 platform to the crane with 4 lifting slings

➤ Secure the lifting slings so that they cannot slip off.



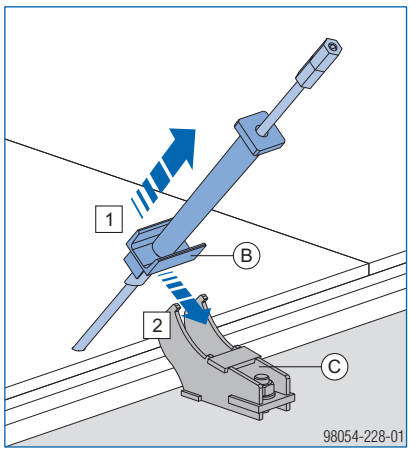
A Anti-slipoff protection for lifting-slings

➤ Fly the Top 50 platform to the ParaTop insert-shoes.



➤ Do not bend tie rods.
The insert-channel must snap into the insert-shoe without having to be forced.

➤ Raise the insert-channel and fit it in place in the insert-shoe.

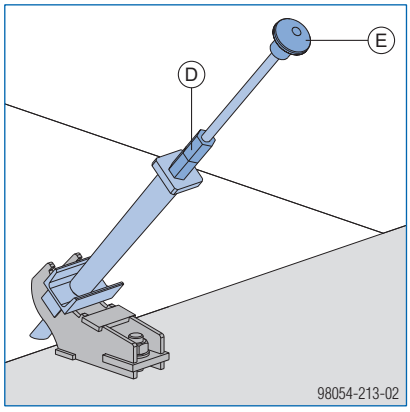


B ParaTop insert-channel U65
C ParaTop insert-shoe steel

➤ Tighten the hexagon nut to pull the Top 50 platform towards the bridge superstructure.
Width-across 30 mm

➤ Lock the hexagon nut 15.0 with a second hexagon nut 15.0.

➤ Fit a protective cap to the tie rod.



D Hexagon nut 15.0
E Protective cap 15.0/20.0

➤ Secure the 2nd anchor of the formwork unit in the same way.

➤ Detach the lifting slings from the Top 50 platform.

➤ When aligning and adjusting, fix the tie rod with a tie-rod wrench to prevent it turning.

➤ Insert fitting-boards between the Top 50 platforms and fix these with nails if necessary.

➤ If necessary, place ballast weights on the Top 50 platforms to prevent them tipping over.

➤ Mount the stop-end formwork.

➤ Spray the formwork sheets and insert-cones with concrete release agent.

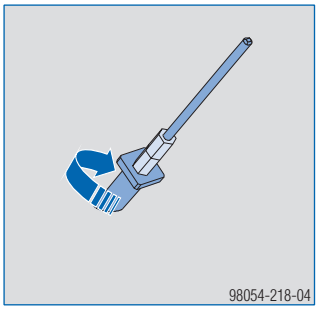
➤ Place the reinforcement.

Pouring

➤ Remove the ballast from the formwork construction, if this is necessary for statical reasons.

➤ Pour from the inside towards the outside.

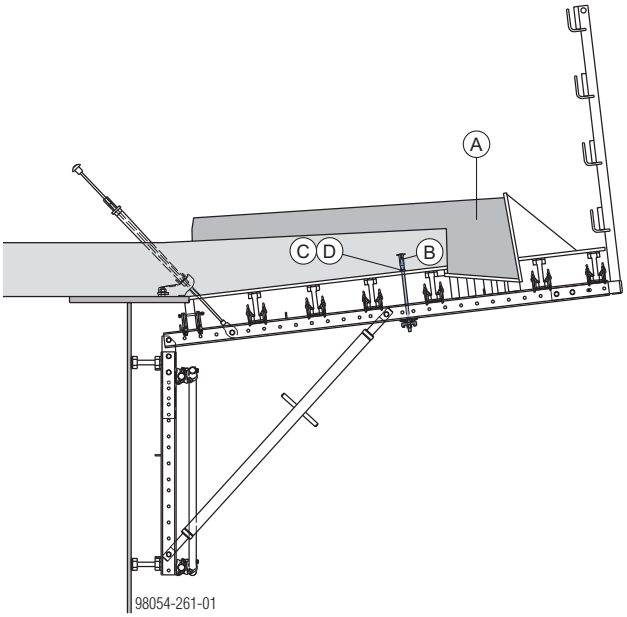
As soon as the concrete is strong enough to be walked on:
Turn the anchoring cones clockwise by approx. 90°, to make it easier to remove them when the formwork is stripped.



2nd casting section for cantilevered parapets

The following measures are necessary if the bracket is not calculated for the entire cross-section and there are 2 pouring operations:

- relieve the load on the bracket before the 2nd pouring operation or
- install a bridge edge beam anchor to take the loads from the 2nd casting section

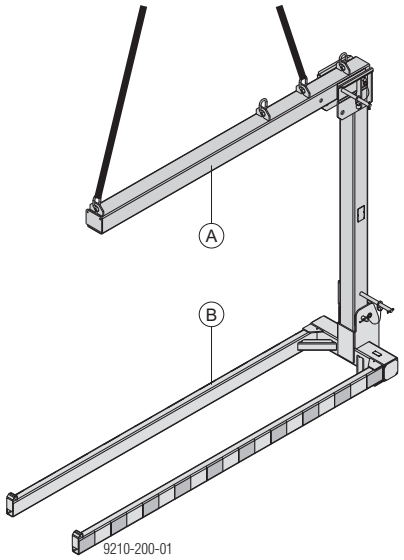


A Cross-section for the 2nd pouring operation
B Bridge edge beam anchor 15.0
C Fibre-concrete tube 22mm
D Universal cone 22mm

Dismantling

Dismounting with transport fork

The Top 50 platform is dismounted using a transport fork.

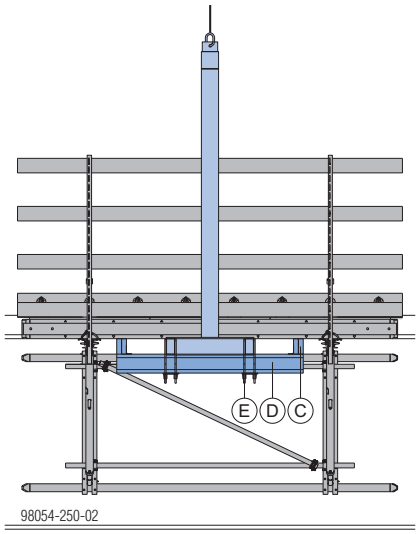


A Lifting extension bracket DF 1t
B Transport fork DF 1t 0.90m

Follow the directions in the 'Lifting extension bracket DF and Transport fork DF' Operating Instructions!

Note:
Use the Transport form DM 1.5 t adjustable if the load-bearing capacity of the fork DF 1t is not enough.

➤ Widen the fork to safeguard the Top 50 platform against tipping over.



C Squared timber
D Doka beam H20
E Brace stirrup 8 + Safety plate for brace stirrup 8

How far the fork needs to be widened will depend on the inter-bracket spacings, so is different for each project.

Follow the directions in the project-specific Operating Instructions for widened transport forks!

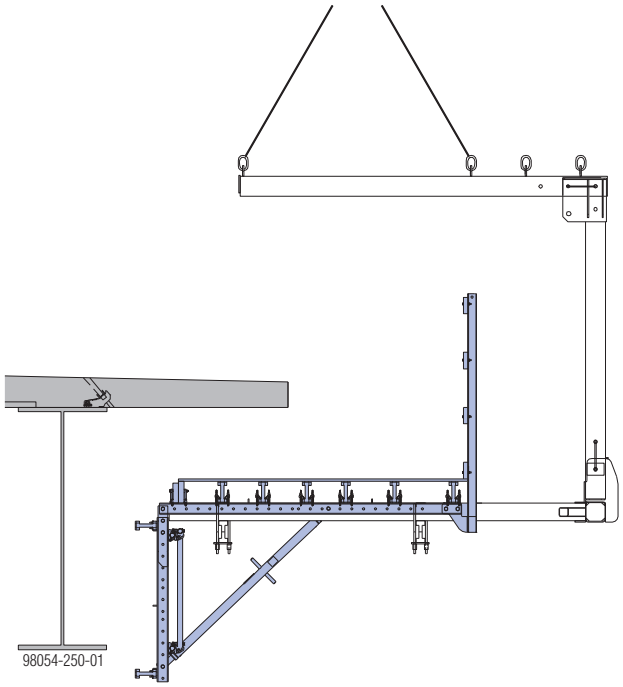
➤ Support the Top 50 platform with the transport fork.

Important note:
➤ When loosening the nuts, fix the tie rod with a tie-rod wrench.

➤ Slacken the hexagon nuts at the suspension point and unscrew them from the tie rod.
The Top 50 platform is now resting on the transport fork.

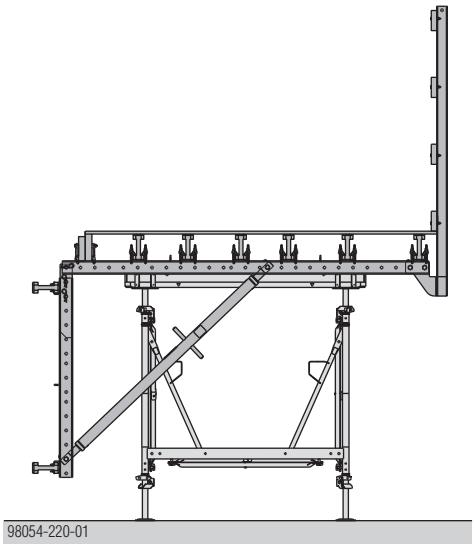
➤ Remove the tie rod with the tie-rod wrench.

➤ Lift the formwork construction away on the transport fork, and set it down on the temporary support.



➤ Detach the insert-cone from the concrete.

➤ The rest of the dismantling sequence is done at ground level, in reverse order.



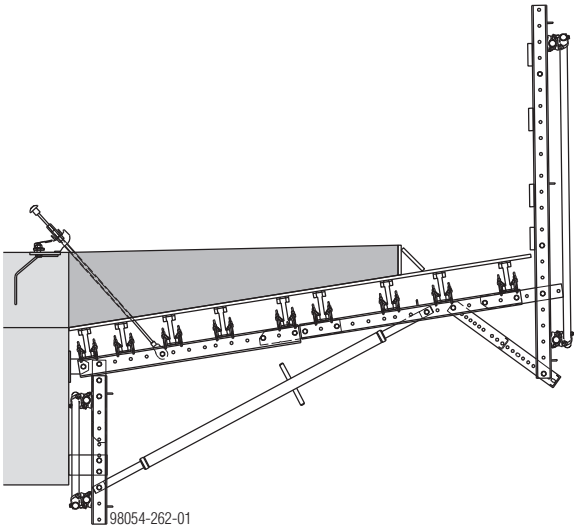
Dismounting with load balancer

A load balancer can be used if it is not possible to dismount the Top 50 platform with a transport fork.

Important note:

A separate statics check is necessary for the load balancer and the bracket.

Follow the directions in the project-specific Operating Instructions for the load balancer!



➤ Pin the load balancer to the Top 50 platform.

Important note:

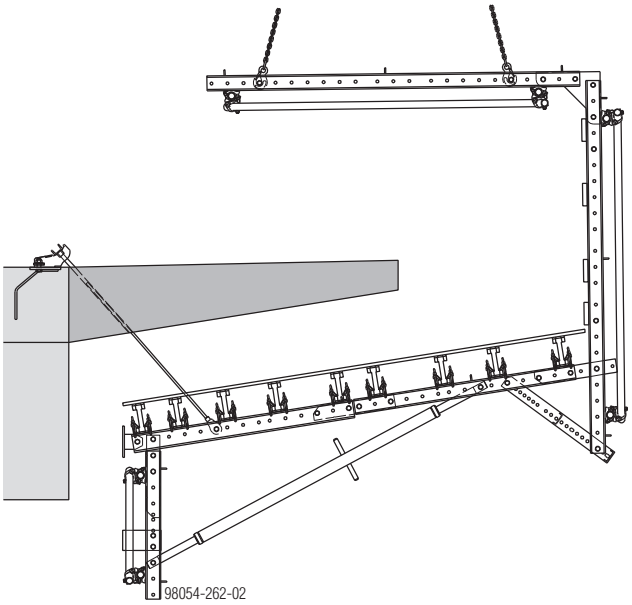
➤ When loosening the nuts, fix the tie rod with a tie-rod wrench.

➤ Slacken the hexagon nuts at the suspension point and unscrew them from the tie rod.

➤ Carefully lower the formwork structure, guiding the tie rods out of the suspension points.

➤ Lift the formwork construction clear with the load balancer and set it down on the temporary support.

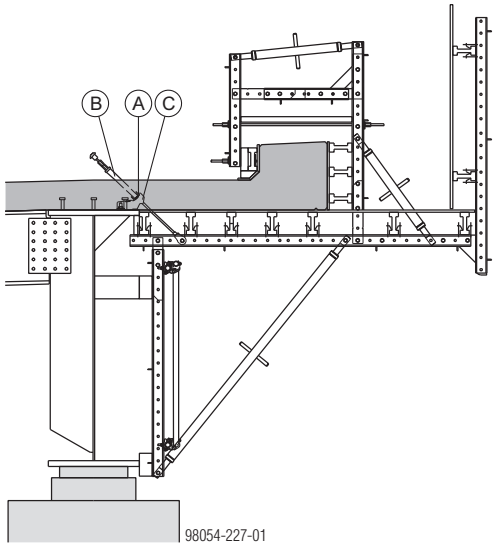
➤ Detach the insert-cone (if present) from the concrete.



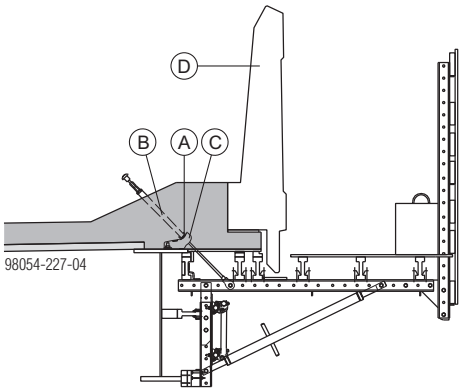
General remarks

Design variants

Used on steel girders

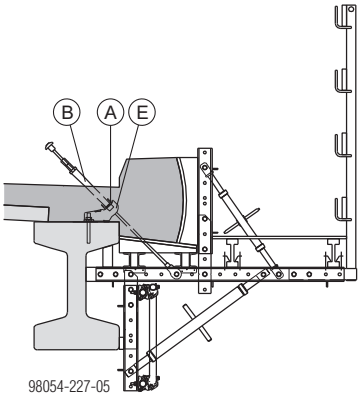


A ParaTop insert-channel U65 (expendable part)
B ParaTop insert-cone 0.35m
C ParaTop insert-shoe steel (expendable part)

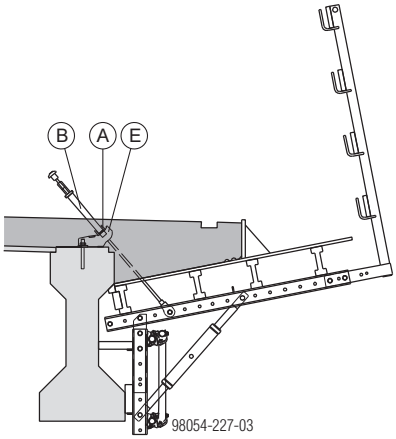


A ParaTop insert-channel U65 (expendable part)
B ParaTop insert-cone 0.35m
C ParaTop insert-shoe steel (expendable part)
D Pre-cast member (retrofitted)

Used on pre-cast concrete members

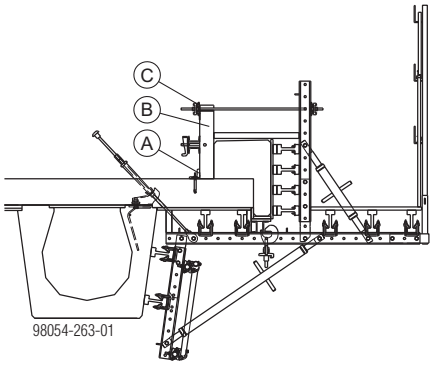


A ParaTop insert-channel U65 (expendable part)
B ParaTop insert-cone 0.35m
E ParaTop insert-shoe concrete (expendable part)



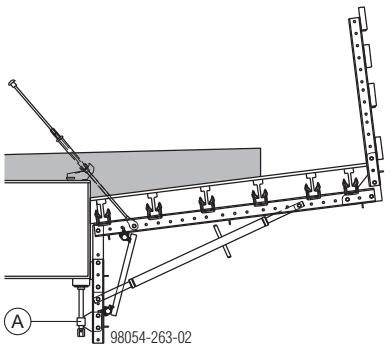
A ParaTop insert-channel U65 (expendable part)
B ParaTop insert-cone 0.35m
E ParaTop insert-shoe concrete (expendable part)

End shuttering with Framax



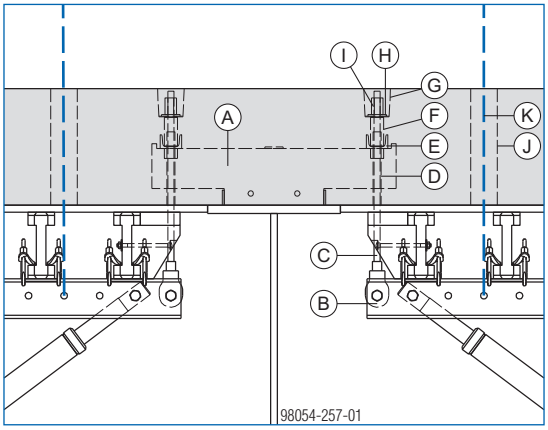
A Framax floor fixing plate
B Framax Xlife panel
C Framax tie-holder bracket

Vertical pressure point, low structures



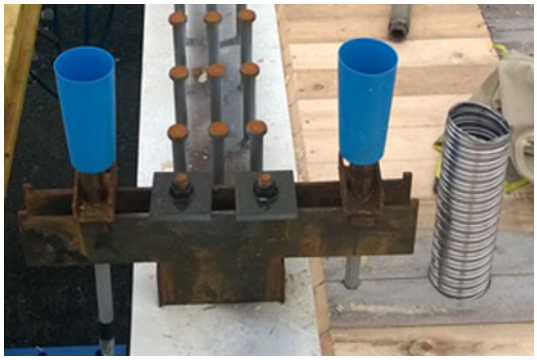
A Height adjuster WS10-WU16

Vertical anchorage

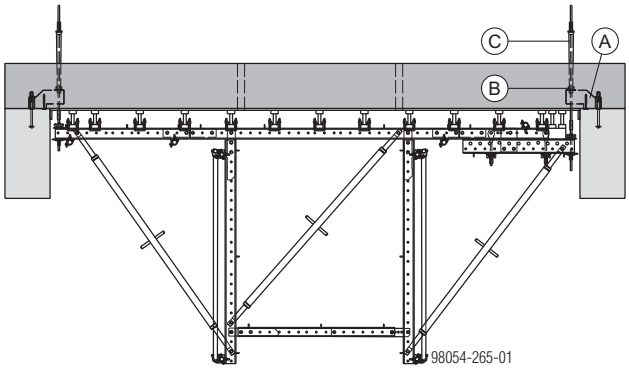


A Custom ParaTop insert-shoe steel (expendable part)
B Eye-lug anchor 15.0 without tie rod
C Tie rod 15.0mm
D Plastic tube 22mm (expendable part)
E ParaTop insert-channel U65 (expendable part)
F ParaTop insert-tube 40x5 (custom component, expendable part)
G Sealing sleeve SCP 20.0
H Washer ISO 7094 - 16 - 100 HV galvanised
I Hexagon nut 15.0
J Tube (site-provided, e.g. ribbed sheathing, DN102)
K Round sling

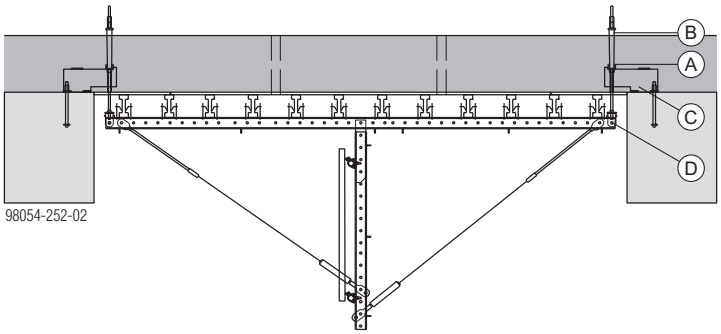
Note:
Tubes inserted in the axis of the girderframe unit enable the formwork to be lowered in the dismounting process.



Used between 2 downstand beams

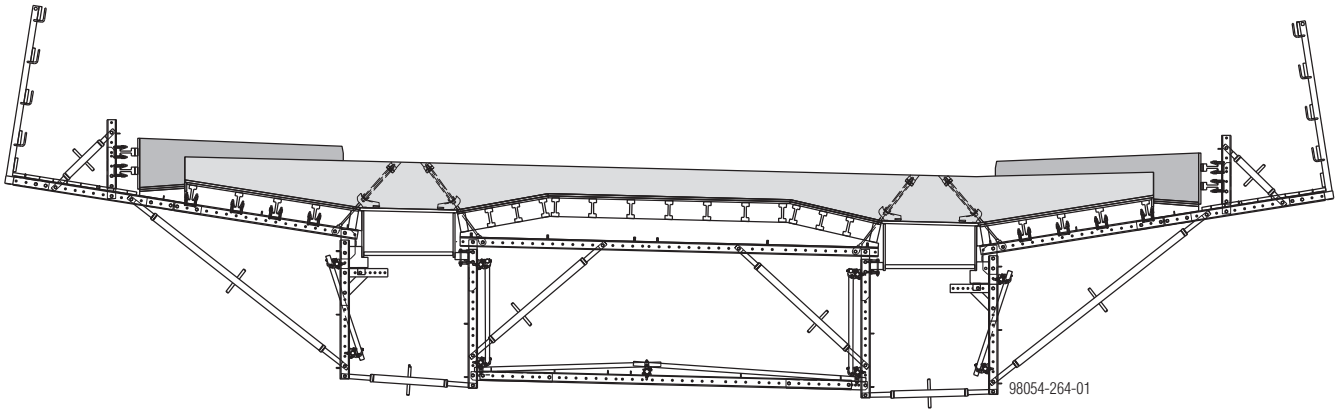


A ParaTop special shoe (expendable part)
B ParaTop insert-channel U65 (expendable part)
C ParaTop insert-cone 0.35m



A ParaTop insert-channel U65 (expendable part)
B ParaTop insert-cone 0.35m
C ParaTop special shoe (expendable part)
D Eye-lug tie rod anchor NG

Used for steel girder with low height

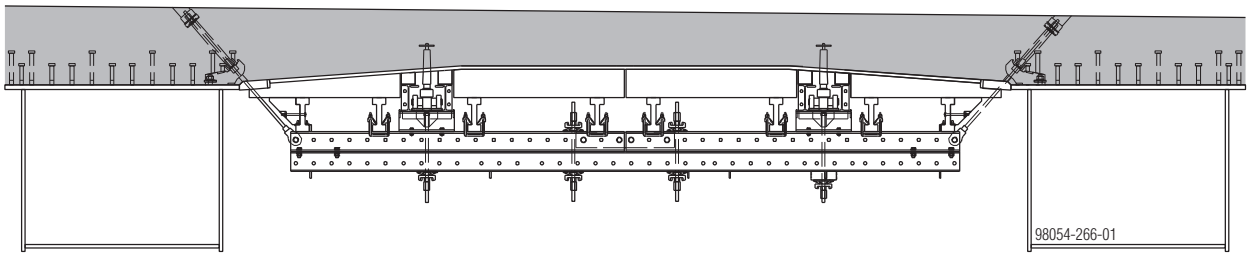


Movable inside formwork

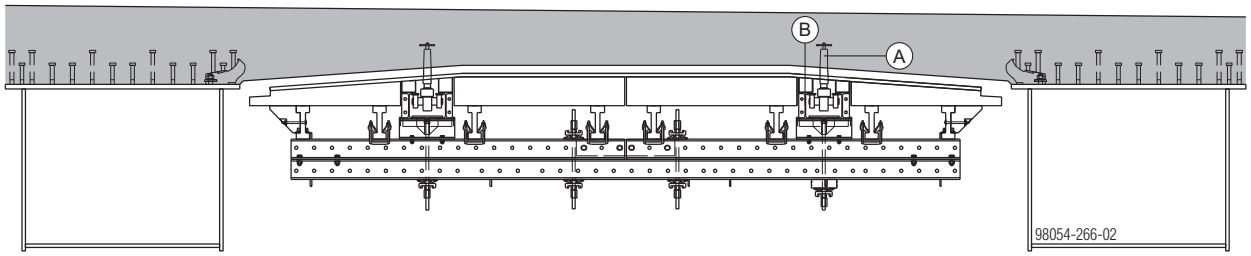
The movable inside formwork is based on the drawer principle of the Composite forming carriage.

Follow the directions in the 'Composite forming carriage' User Information booklet!

Situation during pouring

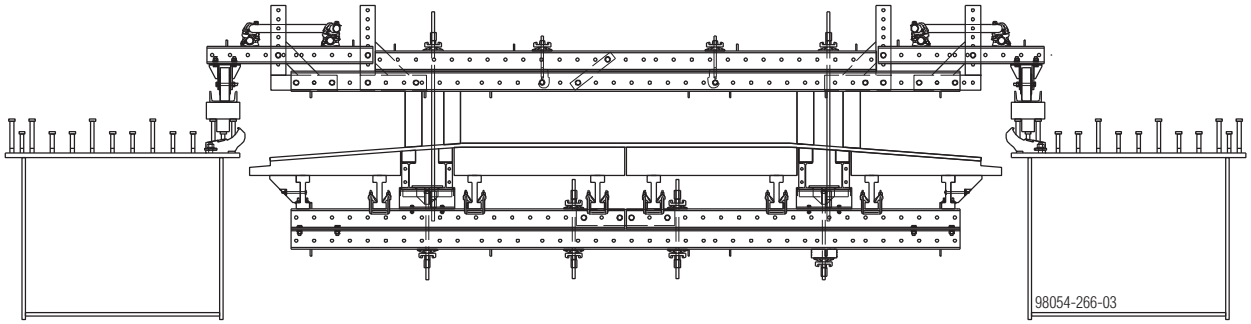


Situation for moving underneath the finished roadway slab



A Roller supports for inside formwork
B Roller girder IPE160 5.00m

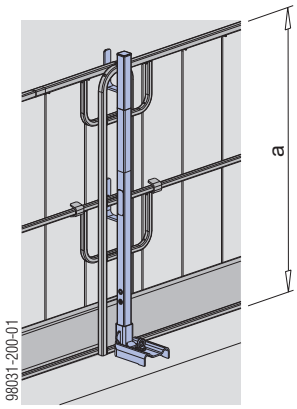
Situation for moving outside the finished roadway slab



Fall-arrest systems on the structure

Handrail post XP 1.20m

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

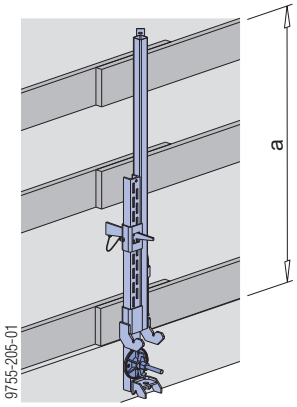


a ... > 1.00 m

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

Handrail clamp T

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

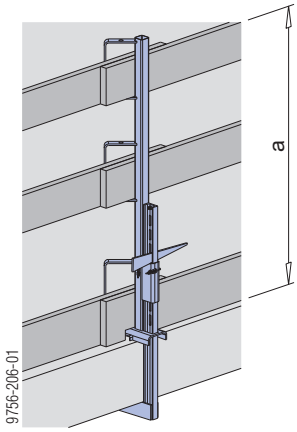


a ... > 1.00 m

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

Handrail clamp S

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

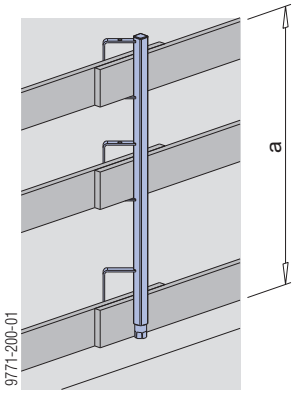


a ... > 1.00 m

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

Handrail post 1.10m

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



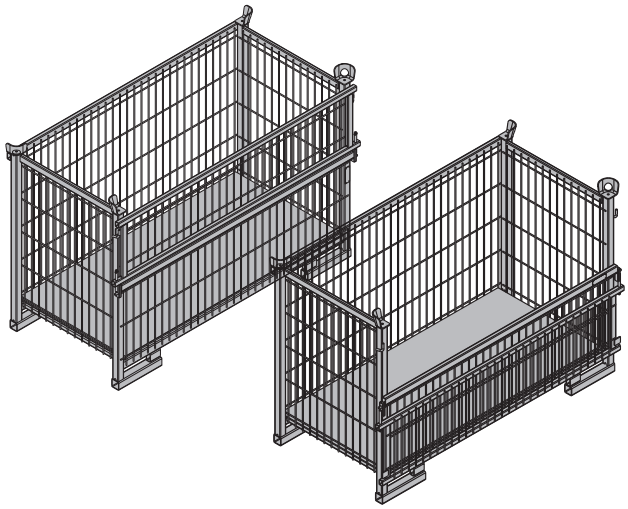
a ... > 1.00 m

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

Transporting, stacking and storing

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

Doka skeleton transport box 1.70x0.80m



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

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

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

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

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

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

Max. n° of boxes on top of one another

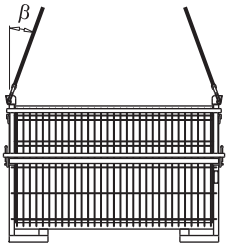
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
2	5
It is not allowed to stack empty pallets on top of one another!	

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

Lifting by crane

➤ Only lift the boxes when their sidewalls are closed!

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

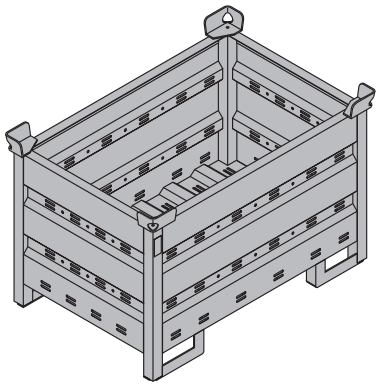


9234-203-01

Repositioning by forklift truck or pallet stacking truck

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

Doka multi-trip transport box 1.20x0.80m galv.



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

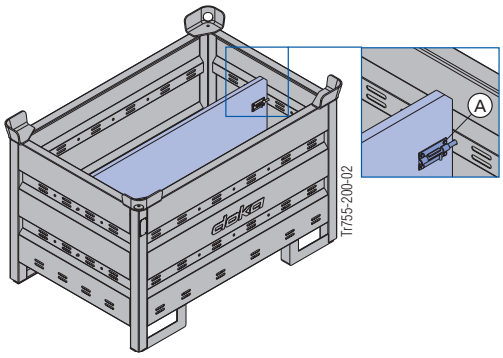
Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

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

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

Multi-trip transport box partition

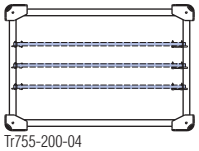
Different items in the Multi-trip transport box can be kept separate with the Multi-trip transport box partitions 1.20m or 0.80m.

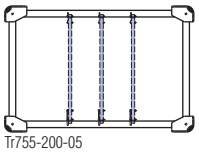


A Slide-bolt for fixing the partition

Possible ways of dividing the box

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


Tr755-200-04


Tr755-200-05

Using Doka multi-trip transport boxes as storage units

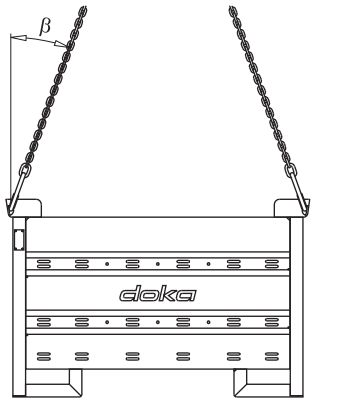
Max. n° of boxes on top of one another

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

Using Doka multi-trip transport boxes as transport devices

Lifting by crane

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

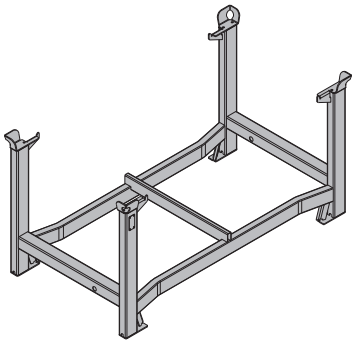


9206-202-01

Repositioning by forklift truck or pallet stacking truck

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

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



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

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

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

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

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

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

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

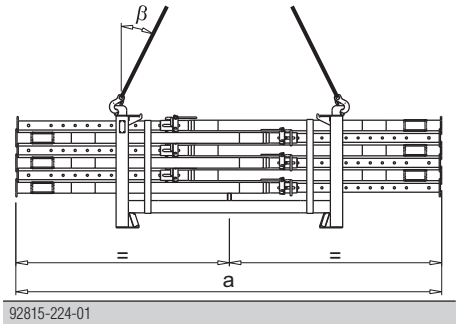
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
2	6
It is not allowed to stack empty pallets on top of one another!	

- **How to use with bolt-on castor set:**
  Always apply the fixing brake when the container is 'parked'.
  When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.

Using Doka stacking pallets as transport devices

Lifting by crane

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

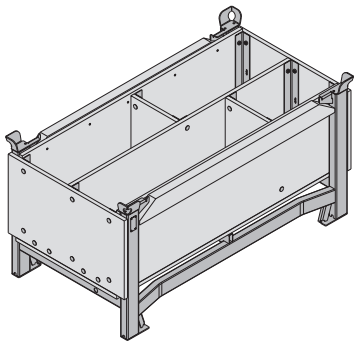


	a
Doka stacking pallet 1.55x0.85m	max. 4.0 m
Doka stacking pallet 1.20x0.80m	max. 3.0 m

Repositioning by forklift truck or pallet stacking truck

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

Doka accessory box



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

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

All connectors and anchoring components can be stored neatly in this box and the boxes can be stacked.

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

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

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

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

Doka accessory boxes as storage units

Max. n° of boxes on top of one another

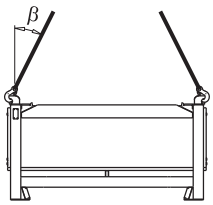
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
3	6
It is not allowed to stack empty pallets on top of one another!	

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

Doka accessory box as transport devices

Lifting by crane

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



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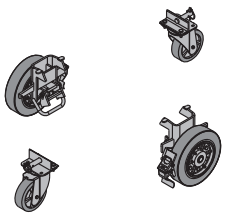
Repositioning by forklift truck or pallet stacking truck

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

Bolt-on castor set B

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

Suitable for drive-through access openings > 90 cm.

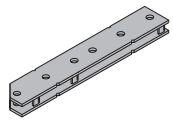
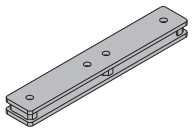
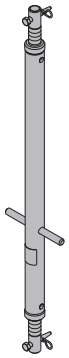
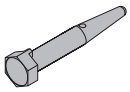
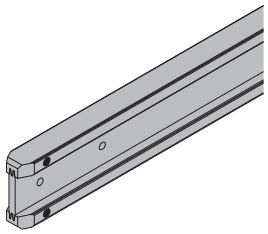


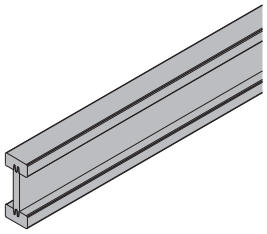
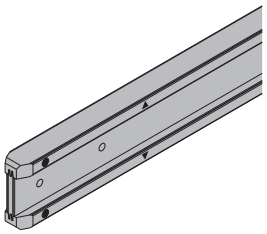
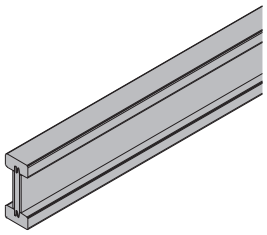
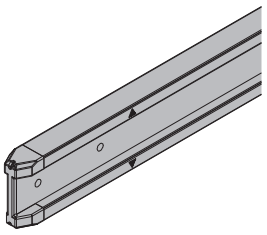
The Bolt-on caster set B can be mounted to the following multi-trip packaging items:
- Doka accessory box
- Doka stacking pallets

Follow the directions in the Operating Instructions!

	[kg]	Article n°
ParaTop insert-shoe concrete ParaTop-Einbauschuh Beton Non-treated	**3.1**	**584444000**
ParaTop insert-shoe steel ParaTop-Einbauschuh Stahl Non-treated	**3.1**	**584443000**
ParaTop insert-channel U65 ParaTop-Einbauprofil U65 Non-treated	**0.89**	**584442000**
ParaTop insert-cone 0.35m ParaTop-Einbaukonus 0,35m Chrome-plated Length: 36 cm	**2.9**	**584441000**
ParaTop insert-cone 0.65m ParaTop-Einbaukonus 0,65m Chrome-plated Length: 66 cm	**6.2**	**584447000**
Eye-lug anchor 15.0 without tie rod Ösenanker 15,0 ohne Ankerstab Galvanised Length: 11 cm	**1.2**	**580649000**

	[kg]	Article n°
Tie rod 15.0mm galvanised 0.50m	**0.72**	**581821000**
Tie rod 15.0mm galvanised 0.75m	**1.1**	**581822000**
Tie rod 15.0mm galvanised 1.00m	**1.4**	**581823000**
Tie rod 15.0mm galvanised 1.25m	**1.8**	**581826000**
Tie rod 15.0mm galvanised 1.50m	**2.2**	**581827000**
Tie rod 15.0mm galvanised 1.75m	**2.5**	**581828000**
Tie rod 15.0mm galvanised 2.00m	**2.9**	**581829000**
Tie rod 15.0mm galvanised 2.50m	**3.6**	**581852000**
Tie rod 15.0mm galvanised .....m	**1.4**	**581824000**
Tie rod 15.0mm non-treated 0.50m	**0.73**	**581870000**
Tie rod 15.0mm non-treated 0.75m	**1.1**	**581871000**
Tie rod 15.0mm non-treated 1.00m	**1.4**	**581874000**
Tie rod 15.0mm non-treated 1.25m	**1.8**	**581886000**
Tie rod 15.0mm non-treated 1.50m	**2.1**	**581876000**
Tie rod 15.0mm non-treated 1.75m	**2.5**	**581887000**
Tie rod 15.0mm non-treated 2.00m	**2.9**	**581875000**
Tie rod 15.0mm non-treated 2.50m	**3.6**	**581877000**
Tie rod 15.0mm non-treated 3.00m	**4.3**	**581878000**
Tie rod 15.0mm non-treated 3.50m	**5.0**	**581888000**
Tie rod 15.0mm non-treated 4.00m	**5.7**	**581879000**
Tie rod 15.0mm non-treated 5.00m	**7.2**	**581880000**
Tie rod 15.0mm non-treated 6.00m	**8.6**	**581881000**
Tie rod 15.0mm non-treated 7.50m	**10.7**	**581882000**
Tie rod 15.0mm non-treated .....m	**1.4**	**581873000**
Ankerstab 15,0mm		
Hexagon nut 15.0 Sechskantmutter 15,0 Galvanised Length: 5 cm Width-across: 30 mm	**0.23**	**581964000**
Sealing sleeve SCP 20.0 Dichtungshülse SCP 20,0 Blue Length: 19.5 cm Diameter: 9 cm	**0.07**	**581650000**
Multi-purpose waling WS10 Top50 0.50m	**10.2**	**580001000**
Multi-purpose waling WS10 Top50 0.75m	**14.9**	**580002000**
Multi-purpose waling WS10 Top50 1.00m	**19.6**	**580003000**
Multi-purpose waling WS10 Top50 1.25m	**24.7**	**580004000**
Multi-purpose waling WS10 Top50 1.50m	**29.7**	**580005000**
Multi-purpose waling WS10 Top50 1.75m	**35.0**	**580006000**
Multi-purpose waling WS10 Top50 2.00m	**38.9**	**580007000**
Multi-purpose waling WS10 Top50 2.25m	**44.2**	**580008000**
Multi-purpose waling WS10 Top50 2.50m	**48.7**	**580009000**
Multi-purpose waling WS10 Top50 2.75m	**54.2**	**580010000**
Multi-purpose waling WS10 Top50 3.00m	**58.9**	**580011000**
Multi-purpose waling WS10 Top50 3.50m	**68.4**	**580012000**
Multi-purpose waling WS10 Top50 4.00m	**79.4**	**580013000**
Multi-purpose waling WS10 Top50 4.50m	**89.1**	**580014000**
Multi-purpose waling WS10 Top50 5.00m	**102.0**	**580015000**
Multi-purpose waling WS10 Top50 5.50m	**112.4**	**580016000**
Multi-purpose waling WS10 Top50 6.00m	**118.0**	**580017000**
Mehrzweckriegel WS10 Top50 Painted blue		
Multi-purpose waling WU12 Top50 1.00m	**25.3**	**580018000**
Multi-purpose waling WU12 Top50 1.25m	**32.0**	**580019000**
Multi-purpose waling WU12 Top50 1.50m	**37.5**	**580020000**
Multi-purpose waling WU12 Top50 1.75m	**44.2**	**580021000**
Multi-purpose waling WU12 Top50 2.00m	**50.0**	**580022000**
Multi-purpose waling WU12 Top50 2.50m	**63.1**	**580023000**
Multi-purpose waling WU12 Top50 3.00m	**75.7**	**580024000**
Multi-purpose waling WU12 Top50 3.50m	**90.7**	**580025000**
Multi-purpose waling WU12 Top50 4.00m	**103.4**	**580026000**
Mehrzweckriegel WU12 Top50 Painted blue		

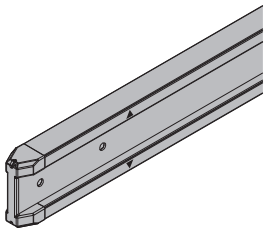
	[kg]	Article n°
Formwork element connector FF20/50 Z Elementverbinder FF20/50 Z Painted blue Length: 55 cm	**6.0**	**587533000**
		
Splice plate SKE50 plus Verbindungslasche SKE50 plus Painted blue Length: 60 cm Width: 10 cm	**10.7**	**581523000**
		
Spindle strut T7 75/110cm	**13.2**	**584308000**
Spindle strut T7 100/150cm	**16.8**	**584309000**
Spindle strut T7 150/200cm	**21.6**	**584324000**
Spindle strut T7 200/250cm	**26.2**	**584325000**
Spindle strut T7 250/300cm	**29.4**	**584326000**
Spindle strut T7 305/355cm	**35.0**	**584327000**
Spindelstrebe T7 Galvanised		
		
Connecting pin 10cm Verbindungsbolzen 10cm Galvanised Length: 14 cm	**0.34**	**580201000**
		
Spring cotter 5mm Federvorstecker 5mm Galvanised Length: 13 cm	**0.03**	**580204000**
		
Doka beam H20 eco P 1.80m	**9.4**	**189940000**
Doka beam H20 eco P 2.45m	**12.7**	**189936000**
Doka beam H20 eco P 2.65m	**13.8**	**189937000**
Doka beam H20 eco P 2.90m	**15.1**	**189930000**
Doka beam H20 eco P 3.30m	**17.2**	**189941000**
Doka beam H20 eco P 3.60m	**18.7**	**189942000**
Doka beam H20 eco P 3.90m	**20.3**	**189931000**
Doka beam H20 eco P 4.50m	**23.4**	**189943000**
Doka beam H20 eco P 4.90m	**25.5**	**189932000**
Doka beam H20 eco P 5.90m	**30.7**	**189955000**
Doka beam H20 eco P 9.00m	**46.8**	**189956000**
Doka beam H20 eco P .....m	**5.2**	**189999000**
Doka beam H20 eco P .....m BS	**5.2**	**189957000**
Doka-Träger H20 eco P Varnished yellow		
		

	[kg]	Article n°
Doka beam H20 eco P 1.25m	**6.5**	**189939000**
Doka beam H20 eco P 12.00m	**62.4**	**189993000**
Doka-Träger H20 eco P Varnished yellow		
		
Doka beam H20 eco N 1.80m	**9.0**	**189283000**
Doka beam H20 eco N 2.45m	**12.3**	**189271000**
Doka beam H20 eco N 2.65m	**13.3**	**189272000**
Doka beam H20 eco N 2.90m	**14.5**	**189273000**
Doka beam H20 eco N 3.30m	**16.5**	**189284000**
Doka beam H20 eco N 3.60m	**18.0**	**189285000**
Doka beam H20 eco N 3.90m	**19.5**	**189276000**
Doka beam H20 eco N 4.50m	**22.5**	**189286000**
Doka beam H20 eco N 4.90m	**24.5**	**189277000**
Doka beam H20 eco N 5.90m	**29.5**	**189287000**
Doka beam H20 eco N .....m	**5.0**	**189299000**
Doka beam H20 eco N .....m BS	**5.0**	**189289000**
Doka-Träger H20 eco N Varnished yellow		
		
Doka beam H20 eco N 1.25m	**6.3**	**189282000**
Doka beam H20 eco N 12.00m	**60.3**	**189288000**
Doka-Träger H20 eco N Varnished yellow		
		
Doka beam H20 top P 1.80m	**9.9**	**189701000**
Doka beam H20 top P 2.45m	**13.2**	**189702000**
Doka beam H20 top P 2.65m	**14.3**	**189703000**
Doka beam H20 top P 2.90m	**15.6**	**189704000**
Doka beam H20 top P 3.30m	**17.7**	**189705000**
Doka beam H20 top P 3.60m	**19.2**	**189706000**
Doka beam H20 top P 3.90m	**20.8**	**189707000**
Doka beam H20 top P 4.50m	**23.9**	**189708000**
Doka beam H20 top P 4.90m	**26.0**	**189709000**
Doka beam H20 top P 5.90m	**31.2**	**189710000**
Doka beam H20 top P .....m	**10.6**	**189700000**
Doka beam H20 top P .....m BS	**5.4**	**189711000**
Doka-Träger H20 top P Varnished yellow		
		

	[kg]	Article n°
Doka beam H20 top N 1.80m	**9.5**	**189011000**
Doka beam H20 top N 2.45m	**12.8**	**189012000**
Doka beam H20 top N 2.65m	**13.8**	**189013000**
Doka beam H20 top N 2.90m	**15.0**	**189014000**
Doka beam H20 top N 3.30m	**17.0**	**189015000**
Doka beam H20 top N 3.60m	**18.5**	**189016000**
Doka beam H20 top N 3.90m	**20.0**	**189017000**
Doka beam H20 top N 4.50m	**23.0**	**189018000**
Doka beam H20 top N 4.90m	**25.0**	**189019000**
Doka beam H20 top N 5.90m	**30.0**	**189020000**
Doka beam H20 top N .....m	**5.2**	**189010000**
Doka beam H20 top N .....m BS	**5.2**	**189021000**

Doka-Träger H20 top N

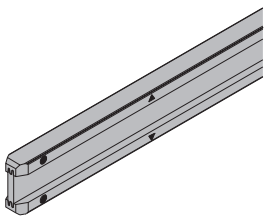
Varnished yellow



Doka beam H16 P 1.80m	**6.7**	**189969000**
Doka beam H16 P 2.45m	**9.1**	**189961000**
Doka beam H16 P 2.90m	**10.7**	**189962000**
Doka beam H16 P 3.30m	**12.2**	**189963000**
Doka beam H16 P 3.90m	**14.4**	**189966000**
Doka beam H16 P 4.90m	**18.1**	**189967000**
Doka beam H16 P 9.00m	**33.3**	**189970000**
Doka beam H16 P .....m	**4.3**	**189960000**

Doka-Träger H16 P

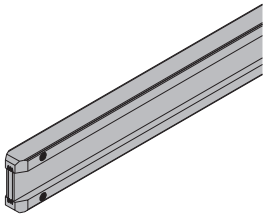
Varnished yellow



Doka beam H16 N 1.80m	**6.3**	**189851000**
Doka beam H16 N 2.45m	**8.6**	**189802000**
Doka beam H16 N 2.90m	**10.2**	**189803000**
Doka beam H16 N 3.30m	**11.6**	**189807000**
Doka beam H16 N 3.90m	**13.7**	**189805000**
Doka beam H16 N 4.90m	**17.2**	**189813000**
Doka beam H16 N 9.00m	**31.5**	**189852000**
Doka beam H16 N .....m	**3.5**	**189850000**

Doka-Träger H16 N

Varnished yellow



Beam screw H 8/70	**0.06**	**580117000**

Riegelverschraubung H 8/70

Galvanised

Length: 8 cm

Width-across: 13 mm

	[kg]	Article n°
Doka formwork sheet 3-SO 21mm 100/50cm	**5.2**	**186007000**
Doka formwork sheet 3-SO 21mm 150/50cm	**7.3**	**186008000**
Doka formwork sheet 3-SO 21mm 200/50cm	**9.7**	**186009000**
Doka formwork sheet 3-SO 21mm 250/50cm	**12.1**	**186011000**
Doka formwork sheet 3-SO 21mm 300/50cm	**14.6**	**186012000**
Doka formwork sheet 3-SO 21mm 350/50cm	**18.0**	**186028000**
Doka formwork sheet 3-SO 21mm 400/50cm	**20.6**	**186013000**
Doka formwork sheet 3-SO 21mm 450/50cm	**23.2**	**186029000**
Doka formwork sheet 3-SO 21mm 500/50cm	**24.3**	**186014000**
Doka formwork sheet 3-SO 21mm 550/50cm	**28.3**	**186023000**
Doka formwork sheet 3-SO 21mm 600/50cm	**30.9**	**186027000**
Doka formwork sheet 3-SO 21mm 100/100cm	**10.3**	**186015000**
Doka formwork sheet 3-SO 21mm 150/100cm	**15.5**	**186016000**
Doka formwork sheet 3-SO 21mm 200/100cm	**19.4**	**186017000**
Doka formwork sheet 3-SO 21mm 250/100cm	**24.3**	**186018000**
Doka formwork sheet 3-SO 21mm 300/100cm	**30.9**	**186019000**
Doka formwork sheet 3-SO 21mm 350/100cm	**36.1**	**186030000**
Doka formwork sheet 3-SO 21mm 400/100cm	**41.2**	**186020000**
Doka formwork sheet 3-SO 21mm 450/100cm	**46.4**	**186031000**
Doka formwork sheet 3-SO 21mm 500/100cm	**48.5**	**186021000**
Doka formwork sheet 3-SO 21mm 550/100cm	**56.7**	**186022000**
Doka formwork sheet 3-SO 21mm 600/100cm	**61.8**	**186024000**
Doka formwork sheet 3-SO 21mm 250/125cm	**32.2**	**186097000**
Doka formwork sheet 3-SO 21mm 300/150cm	**46.4**	**186098000**
Doka formwork sheet 3-SO 21mm 600/150cm	**92.7**	**186099000**
Doka formwork sheet 3-SO 21mm 150/50cm BS	**7.7**	**186008100**
Doka formwork sheet 3-SO 21mm 200/50cm BS	**10.3**	**186009100**
Doka formwork sheet 3-SO 21mm 250/50cm BS	**12.9**	**186011100**
Doka formwork sheet 3-SO 21mm 300/50cm BS	**15.5**	**186012100**

Doka-Schalungsplatte 3-SO 21mm

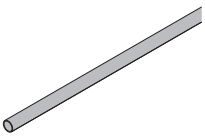
Doka formwork sheet 3-SO 27mm 100/50cm	**6.5**	**187007000**
Doka formwork sheet 3-SO 27mm 150/50cm	**9.8**	**187008000**
Doka formwork sheet 3-SO 27mm 200/50cm	**12.1**	**187009000**
Doka formwork sheet 3-SO 27mm 250/50cm	**16.3**	**187011000**
Doka formwork sheet 3-SO 27mm 300/50cm	**19.5**	**187012000**
Doka formwork sheet 3-SO 27mm 350/50cm	**22.8**	**187028000**
Doka formwork sheet 3-SO 27mm 400/50cm	**26.0**	**187013000**
Doka formwork sheet 3-SO 27mm 450/50cm	**29.3**	**187029000**
Doka formwork sheet 3-SO 27mm 500/50cm	**32.5**	**187014000**
Doka formwork sheet 3-SO 27mm 550/50cm	**35.8**	**187023000**
Doka formwork sheet 3-SO 27mm 600/50cm	**39.0**	**187027000**
Doka formwork sheet 3-SO 27mm 100/100cm	**13.0**	**187015000**
Doka formwork sheet 3-SO 27mm 150/100cm	**19.5**	**187016000**
Doka formwork sheet 3-SO 27mm 200/100cm	**26.0**	**187017000**
Doka formwork sheet 3-SO 27mm 250/100cm	**32.5**	**187018000**
Doka formwork sheet 3-SO 27mm 300/100cm	**39.0**	**187019000**
Doka formwork sheet 3-SO 27mm 350/100cm	**45.5**	**187030000**
Doka formwork sheet 3-SO 27mm 400/100cm	**52.0**	**187020000**
Doka formwork sheet 3-SO 27mm 450/100cm	**58.5**	**187031000**
Doka formwork sheet 3-SO 27mm 500/100cm	**65.0**	**187021000**
Doka formwork sheet 3-SO 27mm 550/100cm	**71.5**	**187022000**
Doka formwork sheet 3-SO 27mm 600/100cm	**78.0**	**187024000**
Doka formwork sheet 3-SO 27mm 250/125cm	**40.6**	**187106000**
Doka formwork sheet 3-SO 27mm 300/150cm	**58.5**	**187107000**
Doka formwork sheet 3-SO 27mm 600/150cm	**117.0**	**187108000**
Doka formwork sheet 3-SO 27mm 150/50cm BS	**9.8**	**187008100**
Doka formwork sheet 3-SO 27mm 200/50cm BS	**13.0**	**187009100**
Doka formwork sheet 3-SO 27mm 250/50cm BS	**16.3**	**187011100**
Doka formwork sheet 3-SO 27mm 300/50cm BS	**19.5**	**187012100**

Doka-Schalungsplatte 3-SO 27mm

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	**3.6**	**682001000**

Gerüstrohr 48,3mm

Galvanised



	[kg]	Article n°
Scaffold tube connection Gerüstrohranschluss Galvanised Height: 7 cm	**0.27**	**584375000**
Screw-on coupler 48mm 50 Anschraubkupplung 48mm 50 Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!	**0.84**	**682002000**
Insertion adapter XP Einschubadapter XP Galvanised Height: 43 cm	**4.1**	**586478000**
Handrail post XP 1.80m Geländersteher XP 1,80m Galvanised Height: 176 cm	**7.0**	**586482000**
Handrail post XP 1.20m Geländersteher XP 1,20m Galvanised Height: 118 cm	**4.1**	**586460000**
Toeboard holder XP 1.20m Fußwehrhalter XP 1,20m Galvanised Height: 21 cm	**0.64**	**586461000**

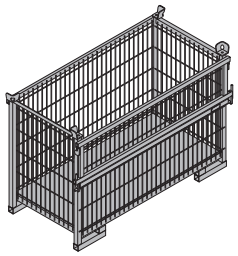
	[kg]	Article n°
Handrail post XP 0.60m Geländersteher XP 0,60m Galvanised Height: 68 cm	**5.0**	**586462000**
Toeboard holder XP 0.60m Fußwehrhalter XP 0,60m Galvanised Height: 21 cm	**0.77**	**586463000**
Railing clamp XP 40cm Geländerzwinge XP 40cm Galvanised Height: 73 cm	**7.7**	**586456000**
Railing clamp XP 85cm Geländerzwinge XP 85cm Galvanised Height: 115 cm	**9.3**	**586468000**
Protective grating XP 2.70x1.20m **Protective grating XP 2.50x1.20m** **Protective grating XP 2.00x1.20m** **Protective grating XP 1.20x1.20m** Schutzgitter XP Galvanised	**22.2** **20.5** **17.4** **12.0**	**586450000** **586451000** **586452000** **586453000**
Protective grating XP 2.70x0.60m **Protective grating XP 2.50x0.60m** **Protective grating XP 2.00x0.60m** Schutzgitter XP Galvanised	**10.1** **9.5** **8.0**	**586466000** **586472000** **586473000**

	[kg]	Article n°
Handrail post T 1.80m Einschubgeländer T 1,80m Galvanised	**17.7**	**584373000**
Toeboard holder T 1.80m Fußwehrhalter T 1,80m Galvanised Height: 13.5 cm	**0.53**	**584392000**
Universal railing SK 2.00m Universal-Geländer SK 2,00m Galvanised	**22.8**	**581325000**
Handrail clamp S Schutzgeländerzwinge S Galvanised Height: 123 - 171 cm	**11.5**	**580470000**
Handrail clamp T Schutzgeländerzwinge T Galvanised Height: 122 - 155 cm	**12.3**	**584381000**

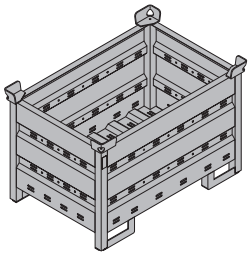
	[kg]	Article n°
Handrail post 1.10m Schutzgeländer 1,10m Galvanised Height: 134 cm	**5.5**	**584384000**
Attachable sleeve 24mm Steckhülse 24mm Grey Length: 16.5 cm Diameter: 2.7 cm	**0.03**	**584385000**
Screw sleeve 20.0 Schraubhülse 20,0 Yellow Length: 20 cm Diameter: 3.1 cm	**0.03**	**584386000**
Reversible ratchet 1/2" Umschaltknarre 1/2" Galvanised Length: 30 cm	**0.73**	**580580000**
Extension 11cm 1/2" Verlängerung 11cm 1/2"	**0.20**	**580581000**
Box nut 30 1/2" Stecknuss 30 1/2"	**0.20**	**580575000**
Doka personal fall-arrest set Doka-Auffanggurt Follow the directions in the "Operating Instructions"! CE	**3.6**	**583022000**

Multi-trip packaging

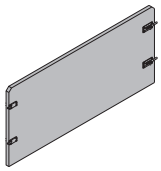
	[kg]	Article n°
Doka skeleton transport box 1.70x0.80m Doka-Gitterbox 1,70x0,80m Galvanised Height: 113 cm	**87.0**	**583012000**



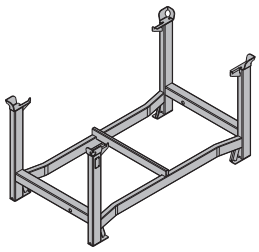
Doka multi-trip transport box 1.20x0.80m Doka-Mehrwegcontainer 1,20x0,80m Galvanised Height: 78 cm	**70.0**	**583011000**



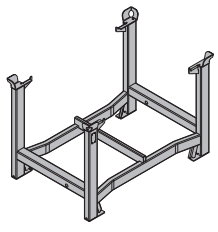
Multi-trip transport box partition 0.80m **Multi-trip transport box partition 1.20m** Mehrwegcontainer Unterteilung Steel parts galvanised Timber parts varnished yellow	**3.7** **5.5**	**583018000** **583017000**



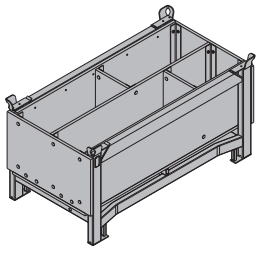
Doka stacking pallet 1.55x0.85m Doka-Stapelpalette 1,55x0,85m Galvanised Height: 77 cm	**41.0**	**586151000**



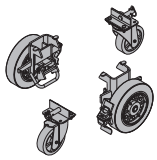
Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m Galvanised Height: 77 cm	**38.0**	**583016000**



Doka accessory box Doka-Kleinteilebox Timber parts varnished yellow Steel parts galvanised Length: 154 cm Width: 83 cm Height: 77 cm	**106.4**	**583010000**



	[kg]	Article n°
Bolt-on castor set B Anklemm-Radsatz B Painted blue	**33.6**	**586168000**



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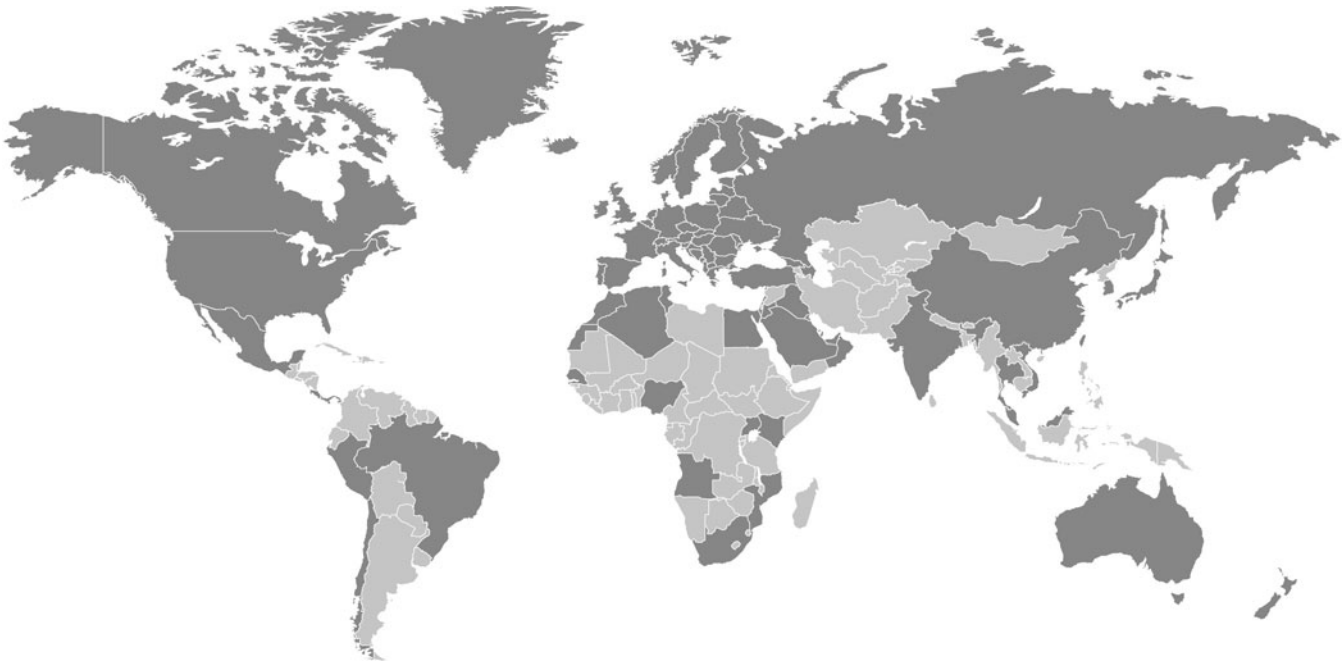

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