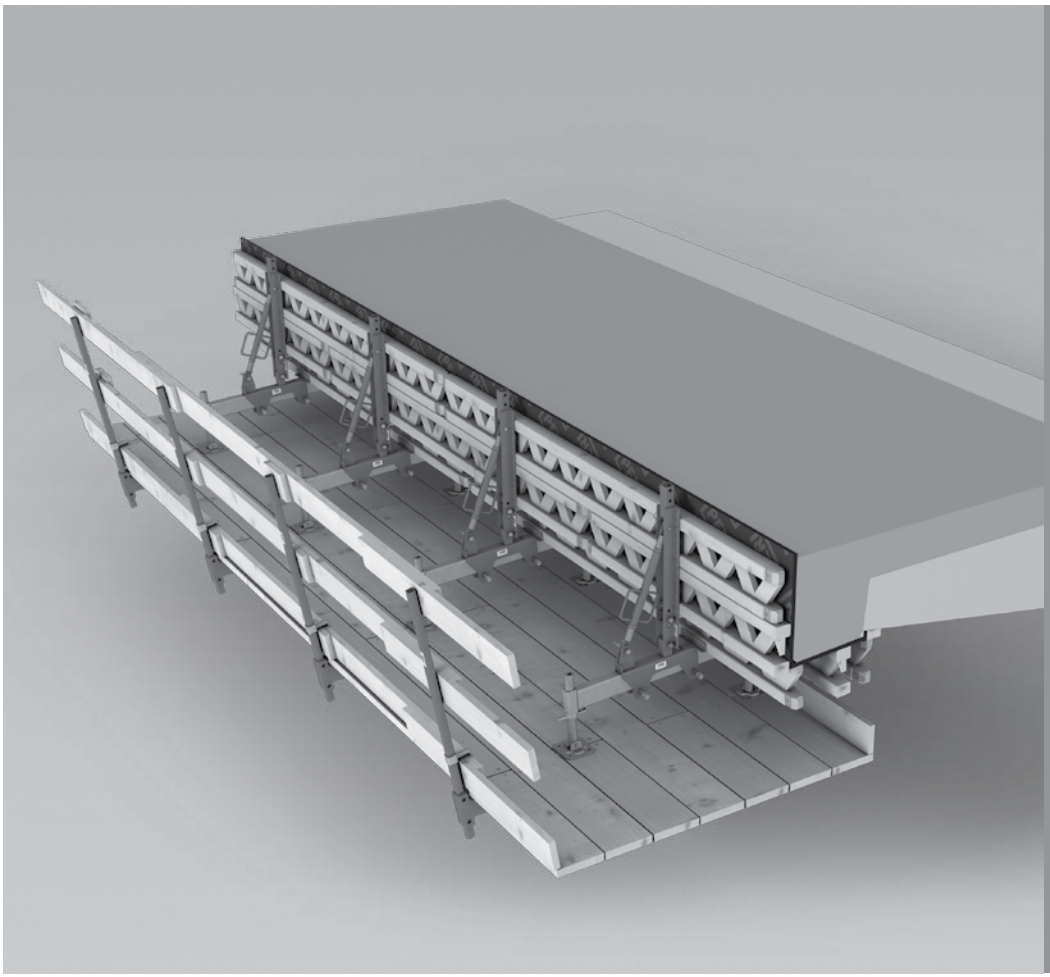
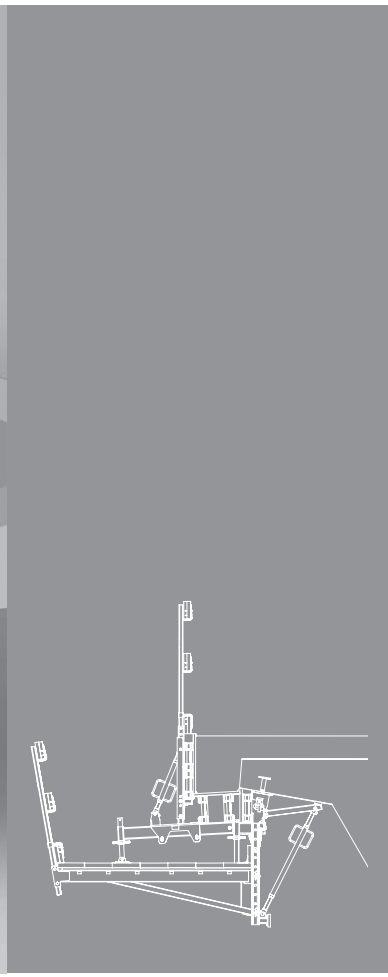
PERI®

VGK
Cantilevered Parapet Bracket

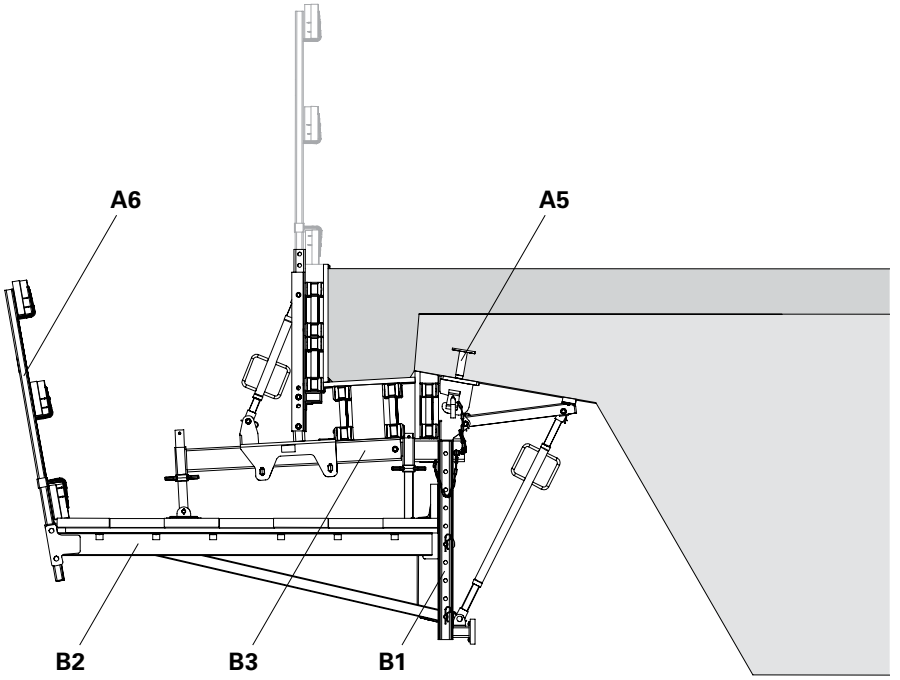
Instructions for Assembly and Use – Standard Configuration – Issue 04/2019



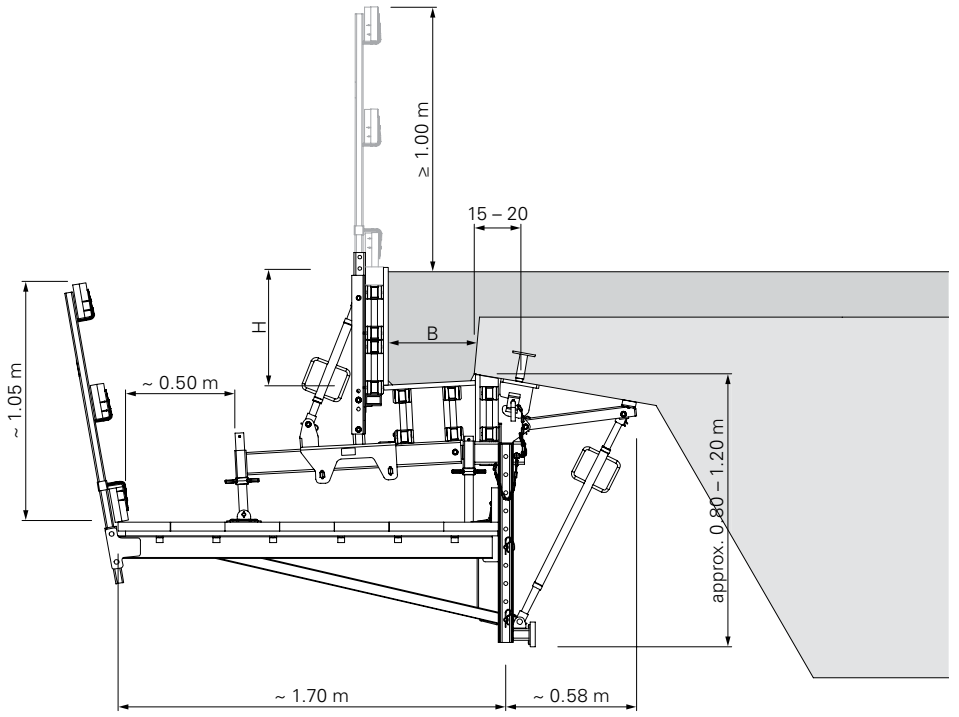


Overview

Main Components



Dimensions



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Overview

Key

Pictogram | Definition


Danger / Warning / Caution


Note


To be complied with


Load-bearing point


Visual check


Tip


Misapplication


Safety helmet


Safety shoes


Safety gloves


Safety glasses


Personal protective equipment to prevent falling from a height (PPE)

Arrows

→ Arrow representing an action

⇨ Arrow representing a reaction of an action*

→ Forces

* if not identical to the action arrow.

Safety instruction categories
The safety instructions alert site personnel to the risks involved and provide information on how to avoid these risks. Safety instructions are featured at the beginning of the section or ahead of the instructions, and are highlighted as follows:


Danger
This sign indicates an extremely hazardous situation which, if not avoided, will result in death or serious injury.


Warning
This sign indicates a hazardous situation which, if not avoided, could result in death or serious injury.


Caution
This sign indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.


Information
This sign indicates situations in which failure to observe the information can result in material damage.

Set-up of the safety instructions


Signal word
Type and source of the danger!
Consequences of non-compliance.
⇒ Avoidance measures.

Dimension specifications
Dimensions are usually given in cm. Other measurement units, e.g. m, are shown in the illustrations.

Conventions
- Instructions are numbered with: 1. ....., 2. ....., 3. .....
- The result of an instruction is shown by: →
- Position numbers are clearly provided for the individual components and are given in the drawing, e.g. **1**, in the text in brackets, for example (1).
- Multiple position numbers, i.e. alternative components, are represented with a slash: e.g. **1 / 2**.

Presentational reference
The illustration on the front cover of these instructions is understood to be a system representation only. The assembly steps presented in these Instructions for Assembly and Use are shown in the form of examples with only one component size. They are valid accordingly for all component sizes contained in the standard configuration.

For a better understanding, detailed illustrations are partly incomplete. Some safety installations which have possibly not been shown in these detailed descriptions must nevertheless still be available.

Target Groups

Contractors
These Instructions for Assembly and Use are designed for contractors who either
- assemble, modify and dismantle the formwork system, or
- use it, e.g. for concreting, or
- allow it to be used for other operations, e.g. carpentry or electrical work.

Competent person
(Construction Site Coordinator)
The Safety and Health Protection Coordinator*
- is appointed by the client,
- must identify potential hazards during the planning phase,
- determines measures that provide protection against risks,
- creates a safety and health plan,
- coordinates the protective measures for the contractor and site personnel so that they do not endanger each other,
- monitors compliance with the protective measures.

Competent person qualified to carry out inspections
Due to the specialist knowledge gained from professional training, work experience and recent professional activity, the competent person qualified to carry out inspections has a reliable understanding of safety-related issues and can correctly carry out inspections. Depending on the complexity of the inspection to be undertaken, e.g. scope of testing, type of testing or the use of certain measuring devices, a range of specialist knowledge is necessary.

Qualified personnel
Formwork systems may only be assembled, modified or dismantled by personnel who are suitably qualified to do so. For the work to be carried out, the qualified personnel must have received instructions** covering at least the following points:
- Explanation of the plan for the assembly, modification or dismantling of the formwork in an understandable form and language.
- Description of the measures for assembling, modifying or dismantling the formwork.
- Naming of the preventive measures to be taken to avoid the risk of persons and objects falling.
- Designation of the safety precautions in the event of changing weather conditions which could adversely affect the safety of the formwork system as well as the persons concerned.
- Details regarding permissible loads.
- Description of all other risks and dangers associated with assembly, modification or dismantling operations.

- **In other countries, ensure that the relevant national guidelines and regulations in the respective current version are complied with!**
- **If no country-specific regulations are available, it is recommended to proceed according to German guidelines and regulations.**
- **A competent person must be present on site during formwork operations.**

* Valid in Germany: Regulations for Occupational Health and Safety on Construction Sites 30 (RAB 30).

** Instructions are given by the contractor himself or a competent person selected by him.

Additional Technical Documentation

- Approvals:
  – Approval No. Z-21.6-1764 Alternative Anchoring
  – Approval No. Z-21.6-1766 PERI Screw-On Cone for the Anchoring of Bracket Scaffold
  – Approval No. Z-21.8-2048 Refurbishment Anchor
- Design information:
  – Design Information for the VARIOKIT VGK
- Original Instructions for Use:
  – Pallets and Stacking Devices
- User information:
  – Concrete Cones with Sealing Compound-3
- Type tests:
  – VARIOKIT VGK Cantilevered Parapet Bracket
- Technical data sheets:
  – Screw-On Sleeve PERI M16/164
- Design Tables 2015 – Formwork and Shoring
- Product brochures:
  – PERI Tie Technology DK, SK

Intended Use

Product description
PERI products have been designed for exclusive use in the industrial and commercial sectors by qualified personnel only.

The VGK Cantilevered Parapet Bracket is used for the concreting of cantilevered parapets in cantilever and abutment areas of bridges cast in-situ or constructed using prefabricated elements.

The system facilitates the forming of parapet geometries up to H/W = 100/60 cm. Working platforms and formwork units are separate. This allows the formwork unit to be readjusted to match the geometry of the parapet from the working platform.

The individual bracket consists of a Vertical Bracket Post, Bracket Cantilever, Platform Cantilever Beam and Spindle, and can be fixed to the bridge at variable distances to one another depending on the parapet cross-section, thus resulting in excellent load optimisation.

When used in bridge construction, the Bracket is anchored using the Anchor Sleeve M24. For refurbishment work, the Bracket can be anchored afterwards by means of composite anchoring systems.

Features
- Platform and formwork units are separated.
- No openings or penetration in the decking.
- Operation and adjustment is carried out from the working platform.
- Continuous inclination adjustment of the slab and side formwork.
- High load-bearing capacity.

Technical data
- Parapet dimensions max. H/W = 100 / 60 cm.
- perm. width of influences up to 185 cm.

Instructions on Use

Use in a way not intended according to the Instructions for Assembly and Use, or any use deviating from the standard configuration or the intended use, represents a misapplication with a potential safety risk, e.g. risk of falling.

Only PERI original parts may be used. The use of other products and spare parts is not allowed.

Changes to PERI components are not permitted.

The system described in these Instructions for Assembly and Use may contain patent-protected components.

Cleaning and Maintenance Instructions

In order to maintain the value and operational readiness of the formwork materials over the long term, clean the panels after each use.
Some repair work may also be inevitable due to the tough working conditions.
The following points should help to keep cleaning and maintenance costs as low as possible.

Spray the formwork on both sides with concrete release agent before each use; this facilitates easier and faster cleaning of the formwork. Spray the concrete release agent very thinly and evenly!

Spray the rear side of the formwork with water immediately after concreting; this avoids any time-consuming and costly cleaning operations.

When used continuously, spray the panel formlining with concrete release agent immediately after striking; then clean by means of a scraper, brush or rubber lip scraper. Important: do not clean formlining made of plywood with high-pressure equipment. This could result in the formlining being damaged.

Fix box-outs and mounting parts with double-headed nails; as a result, the nails can easily be removed later, and damage to the formlining is largely avoided.

Close all unused anchor holes with plugs; this eliminates any subsequent cleaning or repair work.
Anchor holes accidentally blocked with concrete are freed by means of a steel pin from the formlining side.

When placing bundles of reinforcement bars or other heavy objects on horizontally stored formwork elements, suitable support, e.g. square timbers, is to be used: this largely avoids impressions and damage to the formlining.

Internal concrete vibrators should be fitted with rubber caps if possible; as a result, any damage to the formlining is reduced if the vibrator is accidentally inserted between the reinforcement and formlining.

Never clean powder-coated components, e.g. elements and accessories, with a steel brush or hard metal scraper: this ensures that the powder coating remains intact.
Use spacers for reinforcement with large-sized supports or extensive areas of support; this largely avoids impressions being formed in the formlining when under load.

Mechanical components, e.g. spindles or gear mechanisms, must be cleaned of dirt or concrete residue before and after use, and then greased with a suitable lubricant.

Provide suitable support for the components during cleaning so that no unintentional change in their position is possible.

Cross-System

General
The contractor must ensure that the Instructions for Assembly and Use supplied by PERI are available at all times and understood by the site personnel.

These Instructions for Assembly and Use can be used as the basis for creating a risk assessment. The risk assessment is compiled by the contractor. However, these Instructions for Assembly and Use do not replace the risk assessment!

Always take into consideration and comply with the safety instructions and permissible loads.

For the application and inspection of PERI products, the current safety regulations and guidelines valid in the respective countries must be observed.

Materials and working areas are to be inspected on a regular basis, especially before each use and assembly, for:
- signs of damage,
- stability and
- function.

Damaged components must be exchanged immediately on site and may no longer be used.

Safety components are to be removed only when they are no longer required.

Components provided by the contractor must conform to the characteristics required in these Instructions for Assembly and Use, as well as all valid construction guidelines and standards. Unless otherwise indicated, this applies in particular to:
- timber components: Strength Class C24 for Solid Wood according to EN 338.
- scaffold tubes: galvanised steel tubes with minimum dimensions of Ø 48.3 x 3.2 mm according to EN 12811-1:2003 4.2.1.2.
- scaffold tube couplings according to EN 74.

Deviations from the standard configuration are only permitted after a further risk assessment has been carried out by the contractor.
Appropriate measures for working and operational safety, as well as stability, are defined on the basis of this risk assessment.
Corresponding proof of stability can be provided by PERI on request if the risk assessment and resulting measures to be implemented are made available.

Before and after exceptional occurrences that may have an adverse effect on the safety of the formwork system, the contractor must immediately
- create another risk assessment, with appropriate measures being carried out based on the results to ensure the stability of the formwork system,
- arrange for an extraordinary inspection to be carried out by a competent person qualified to do so. The aim of this inspection is to identify and rectify any damage in good time, in order to guarantee the safe use of the formwork system.

Exceptional occurrences can include:
- accidents,
- longer periods of non-use,
- natural events, e.g. heavy rainfall, icing, heavy snowfall, storms or earthquakes.

Assembly, modification and dismantling work
Assembly, modification or dismantling of formwork systems may only be carried out by qualified persons under the supervision of a competent person. The qualified personnel must have received appropriate training for the work to be carried out with regard to specific risks and dangers.

On the basis of the risk assessment and the Instructions for Assembly and Use, the contractor must create installation instructions in order to ensure safe assembly, modification and dismantling of the formwork system.

The contractor must ensure that the personal protective equipment required for the assembly, modification or dismantling of the formwork system, e.g.
- safety helmet,
- safety shoes,
- safety gloves,
- safety glasses,

is available and used as intended.

If personal protective equipment against falling from a height (PPE) is required or specified in local regulations, the contractor must determine appropriate attachment points on the basis of the risk assessment.
The contractor stipulates the PPE to be used to prevent falling.

The contractor must
- provide safe working areas for site personnel which are to be reached through the provision of safe access ways. Areas of risk must be cordoned off and clearly marked.
- ensure the stability during all stages of construction, in particular during assembly, modification and dismantling operations.
- ensure and prove that all loads can be safely transferred.

Utilisation
Every contractor who uses or allows formwork systems or sections of the formwork to be used, is responsible for ensuring that the equipment is in good condition.

If the formwork system is used successively or at the same time by several contractors, the health and safety coordinator must point out any possible mutual hazards and all work must be then coordinated.

System-Specific

Retract components only when the concrete has sufficiently hardened, and the person in charge has given the go-ahead for striking to take place.

Working areas situated below must be protected by means of appropriate measures.

Secure tools and materials to prevent them from falling to the ground. Remove concrete excess and other forms of dirt.

Every Cantilevered Parapet Bracket must have its own anchoring. Loosening or removal of the anchoring is only possible on the side of the load transfer.

Constructional requirements regarding the use of the anchoring methods are to be taken into account.

Check that the anchor is correctly installed before concreting takes place. PERI recommends compiling an acceptance report.

Anchoring is to take place only if the anchorage has sufficient concrete strength.

Screw the Anchor Sleeve M24 as far as possible on the fibre cement pipe on the Anchor Positioning Stud M24.

The threaded areas on the Screw-On Cone-2 as well as the Threaded Plate DW 20 must always be completely screwed in.

The required anchoring depth h must not be achieved through a reduction in the screw-in depth.

Do not use any anchoring components and mountings in advance which are damaged.

Examples of damage:
- deformed components,
- rough or scratched cone surfaces,
- blocked threads,
- weld splashes on the threads.

Check the functionality of the slide bearings before every use. Do not use Bracket Cantilever VGK 50 if the grouting is damaged.

Storage and Transportation

Store and transport components ensuring that no unintentional change in their position is possible. Detach lifting accessories and slings from the lowered components only if they are in a stable position and no unintentional change is possible.

Do not drop the components.

Use PERI lifting accessories and slings and only those load-bearing points provided on the component.

During the moving procedure,
- ensure that components are picked up and set down so that unintentional falling over, falling apart, sliding, falling down or rolling is avoided.
- no persons are allowed to remain under the suspended load.

The access areas on the construction site must be free of obstacles and tripping hazards as well as being slip-resistant.

For transportation, the surface must have sufficient load-bearing capacity.

Use original PERI storage and transport systems, e.g. Crate Pallets, Pallets or Stacking Devices.

A1 Assembly Versions

Standard use on cantilevers ≥ 75 cm

(Fig. A1.01)

Take into account Section A3 – System Selection.

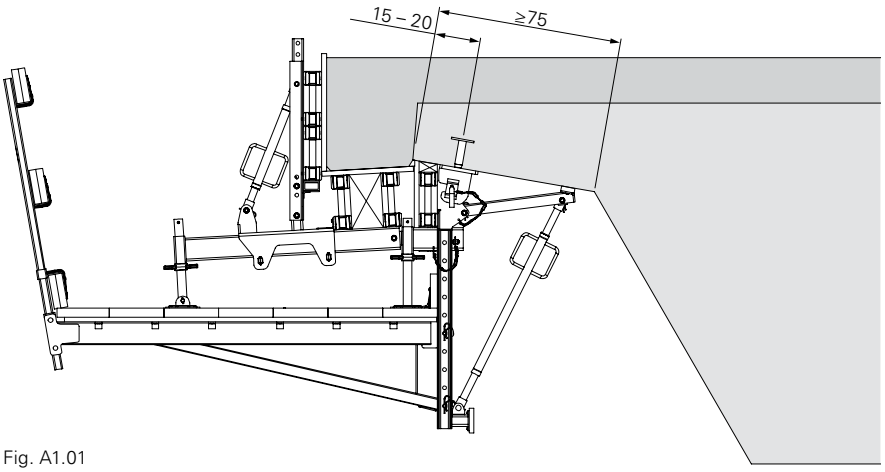


Fig. A1.01

Intermediate area on cantilevers 35 – 75 cm

Secure Adjustable Base Plate UJB 38-80/55 (9) against falling out and unintentional twisting.

With Adj. Base Plate UJB 38-80/55 (9). (Fig. A1.02)

Take into account Section A3 – System Selection.

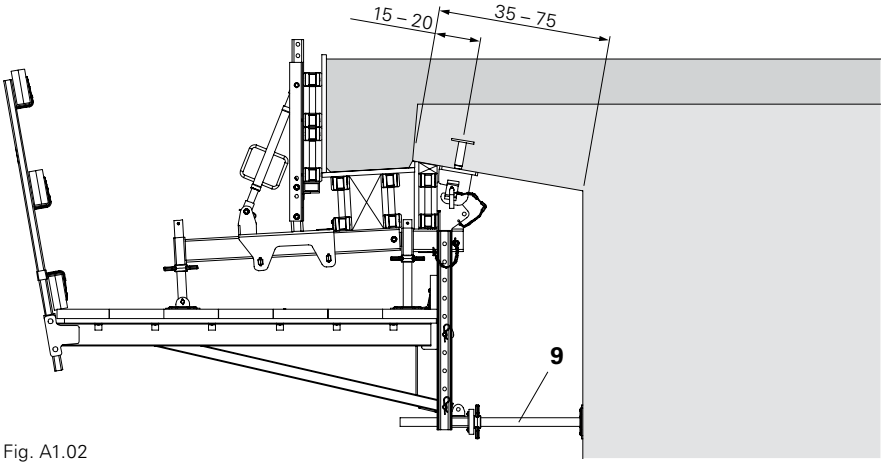


Fig. A1.02

A1 Assembly Versions

Vertical use on abutments

Dimension x according to project-specific planning.
(Fig. A1.03)

Take into account Section A3 – System Selection.

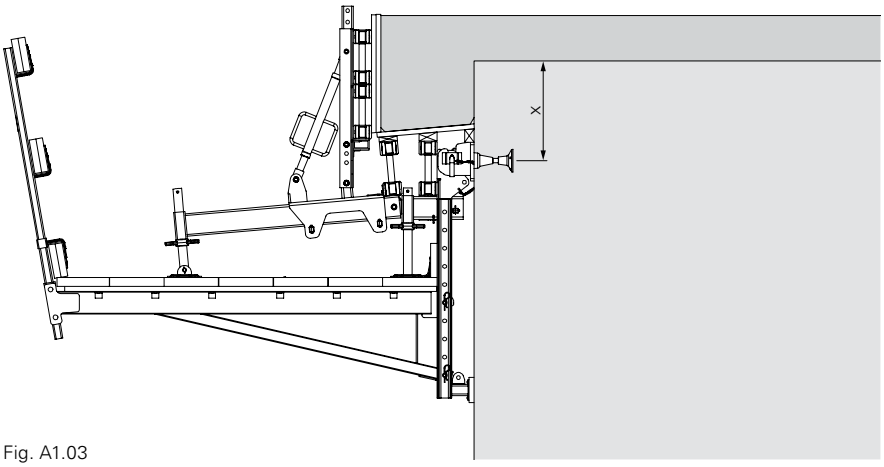


Fig. A1.03

Complete enclosure with Guardrail Post RCS/SRU 184

Assembly
1. Attach Guardrail Post RCS/SRU 184 (30) to Platform Cantilever Beam VGK 170 (4), SW 30.
2. Attach enclosure to the Guardrail Posts.

(Fig. A1.04)

Take into account Section A3 – System Selection.

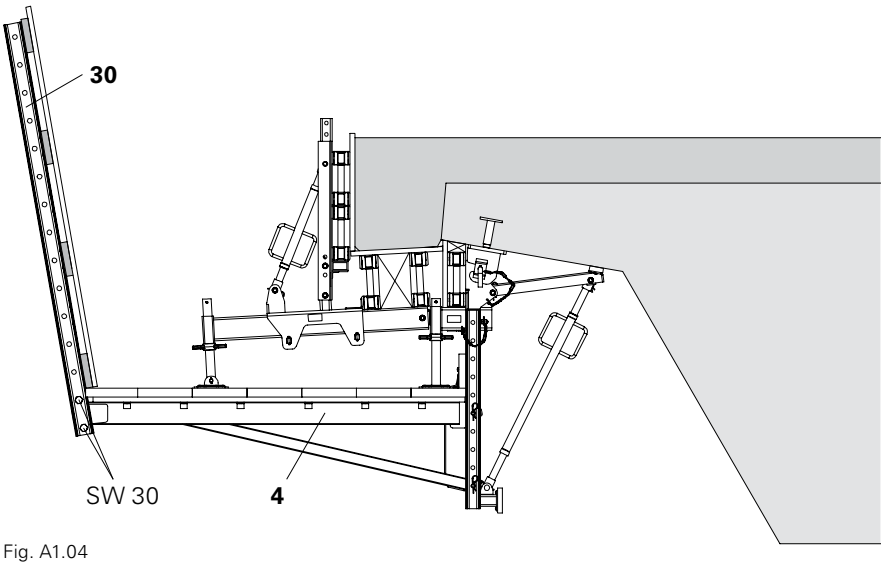


Fig. A1.04

Working scaffold

Cantilever
(Fig. A1.05)

Abutment
(Fig. A1.06)

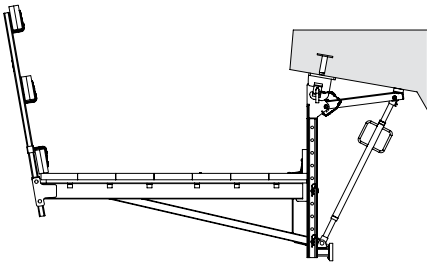


Fig. A1.05

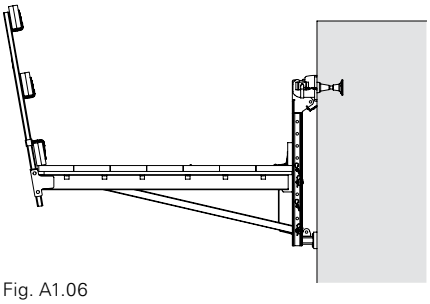


Fig. A1.06

A2 Load Conditions

Use as formwork scaffold

- All given loads are characteristic loads.

Working/Concreting
- Adjust the formwork.
- Install reinforcement in the cantilevered parapet.
- Close side formwork and concrete.
- Strike.
- Inspection and maintenance.
- Max. wind speed ≤ 64 km/h.

Load Case: Working	
Live load on the platform	2,00 kN/m²
Max. working wind speed	0,20 kN/m² (V_w = 64 km/h)

(Table A2.01)

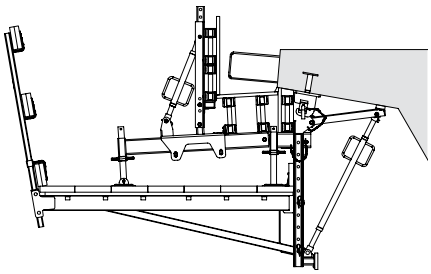


Fig. A2.01

Load Case: Concreting	
Live load on the platform	0,75 kN/m²
Max. working wind speed	0,20 kN/m² (V_w = 64 km/h)
hydrostatic fresh concrete pressure with γ_{Beton} = 25 kN/m³	

(Table A2.02)

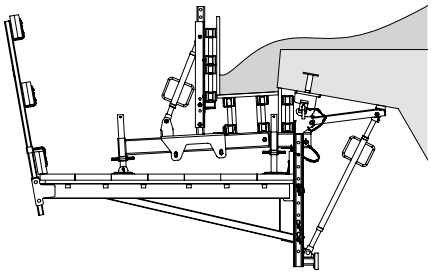


Fig. A2.02

Storm (non-operational)
During longer work breaks or storm warnings with wind speeds > 64 km/h.

- All given loads are characteristic loads.
- Implement safety measures according to Section A7.
- Remove loose materials and equipment.
- Do not access brackets in storm conditions.
- For storm warnings with wind speeds > 111 km/h, an authorised person is to be informed and separate safety measures must be implemented.

Load Case: Storm	
Live load on the platform	0,00 kN/m² ≤0,60 kN/m²
Peak velocity pressure qp(z)*	(V_w ≤ 111 km/h)

* *Max. peak velocity pressure qp(z), including service life-dependent reduction.

(Table A2.03)

Use as working platform for parapet refurbishment

- All given loads are characteristic loads.
- All demolished concrete is to be immediately removed. No accumulation of demolished concrete.
- Secure working areas located underneath against falling objects.

Working

- Demolish existing cantilevered parapet.
- Continuously remove demolished concrete from the working platform.
- Carry out refurbishment work.
- Max. wind speed ≤ 64 km/h.

Load Case: Working	
Live load on the platform	2,00 kN/m²
Max. working wind speed	0,20 kN/m² (V_w = 64 km/h)

(Table A2.04)

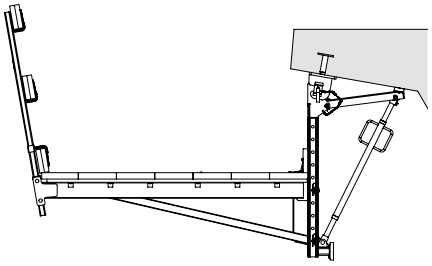


Fig. A2.03

Storm (non-operational)

During longer work breaks or storm warnings with wind speeds > 64 km/h.

- All given loads are characteristic loads.
- Implement safety measures according to Section A7.
- Remove loose materials and equipment.
- Do not access brackets in storm conditions.
- For storm warnings with wind speeds > 111 km/h, an authorised person is to be informed and separate safety measures must be implemented.

Load Case: Storm	
Live load on the platform	0,00 kN/m²
Peak velocity pressure qp(z)*	≤0,60 kN/m² (V_W ≤ 111 km/h)

* Max. peak velocity pressure qp(z), including service life-dependent reduction.

(Table A2.05)

The distance from the top edge of the parapet to the bottom edge of the bridge cantilever is max. 55 cm in accordance with the type calculations for both assembly types. (Fig. A3.01)

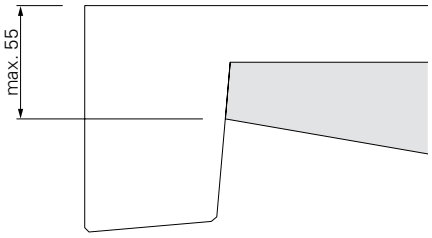


Fig. A3.01

Cantilevered Parapet with Bracket Post VGK 70

Dimensions

External height	H_{max} = 60 cm
Parapet width	B_{max} = 60 cm

(Fig. A3.02)

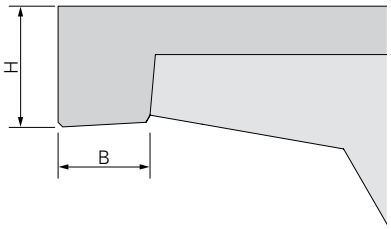


Fig. A3.02

Required formwork components:

1a Bracket Post VGK 70
2a Kicker AV 82

(Fig. A3.03)

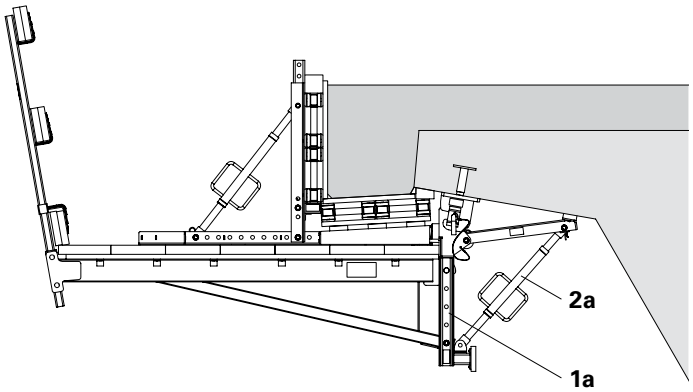


Fig. A3.03

Cantilevered Parapet with Bracket Post VGK 110

Dimensions

External height	H_{max} = 60 cm
Parapet width	B_{max} = 60 cm

(Fig. A3.04)

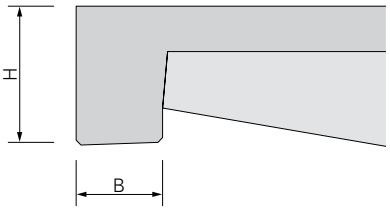


Fig. A3.04

Required formwork components:

1b	Bracket Post VGK 110
2b	Kicker AV 111
29	Guardrail Post HSGP-2 (optional)

(Fig. A3.05)

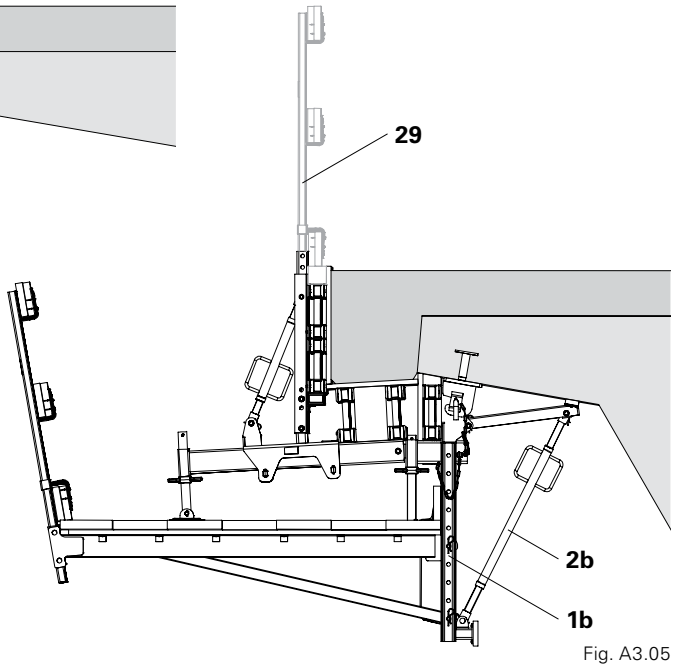


Fig. A3.05

Cantilevered Parapet with Bracket Post VGK 139

Dimensions

External height	H_{max} = 100 cm
Parapet width	B_{max} = 60 cm

(Fig. A3.06)

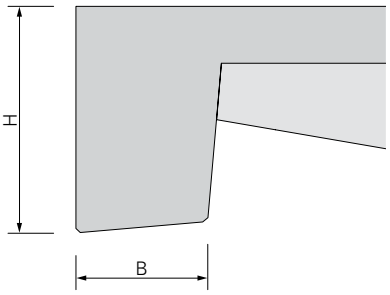


Fig. A3.06

Required formwork components:

1c	Bracket Post VGK 139
2c	Kicker AV 140
8	Formwork Post Extension VGK 40
29	Guardrail Post HSGP-2

(Fig. A3.07)

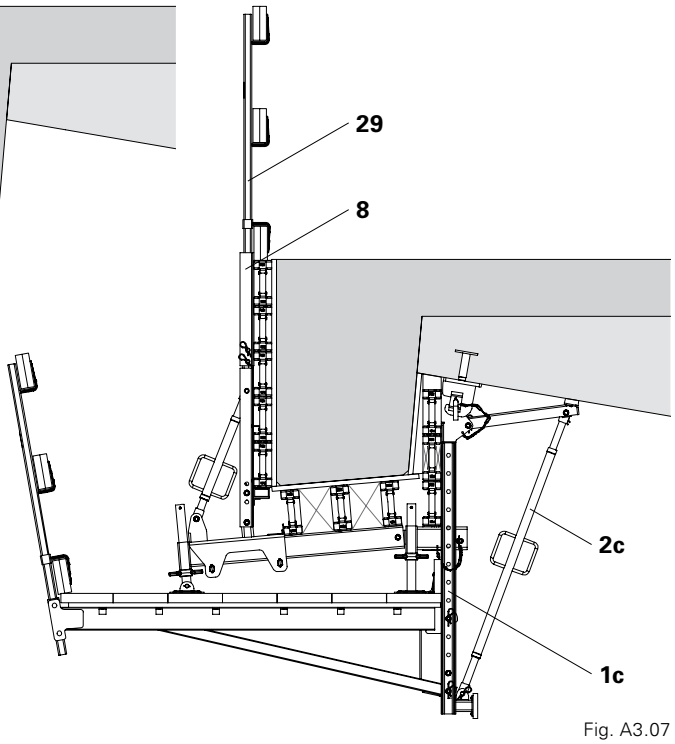


Fig. A3.07

Cantilevered Parapet with Bracket Post VGK 70

Assembly with Bracket Post VGK 70 and Kicker AV 82

- The Kicker AV 82 (2a) is always connected to the base of the Bracket Post 70 (1a) by means of bolts and cotter pins. (Fig. A4.01a)
- Adapt Tie Rod DW 15 (56) with timbers (37). (Fig. A4.01b)
- Mount the Platform Cantilever Beam VGK 170 (4) in the top and bottom holes of the Bracket Post VGK 70 (1a). (Fig. A4.01a)

- Never attach the Kicker AV 82 (2a) between the fixing points of the Platform Cantilever Beam VGK 170 (4). (Fig. A4.01c)
- Before demolition work begins or in the case of strong vibrations, the Kicker AV must be secured against unintentional turning. (see Section A9)

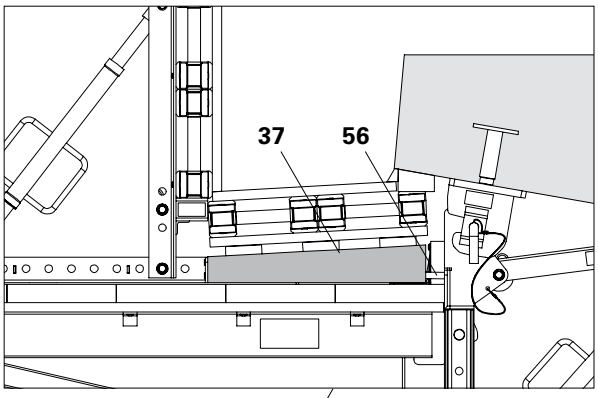


Fig. A4.01b

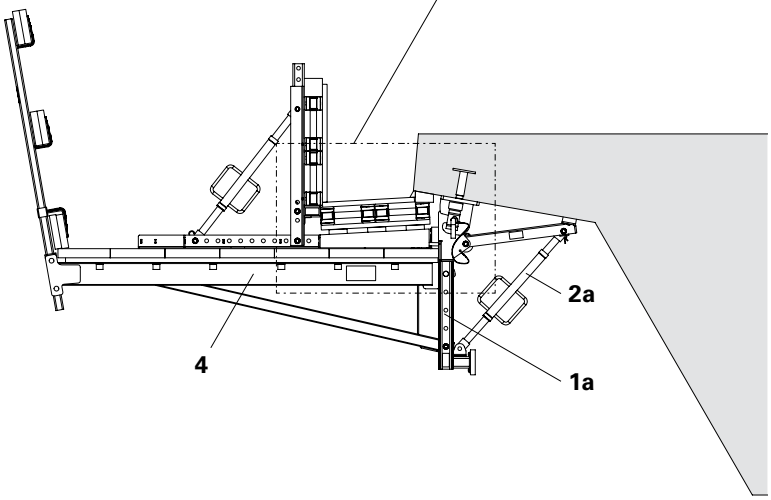


Fig. A4.01a

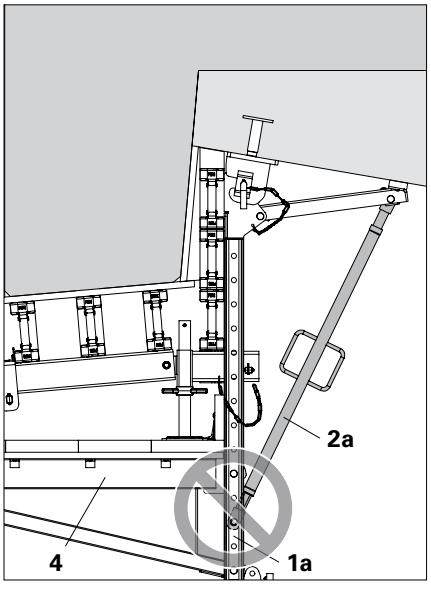


Fig. A4.01c

Cantilevered Parapet with Bracket Post VGK 110

Assembly with Bracket Post VGK 110 and Kicker AV 111

- The Kicker AV 111 (2b) is always connected to the base of the Bracket Post VGK 110 (1b) by means of bolts and cotter pins. (Fig. A4.02a)
- The Platform Cantilever Beam VGK 170 (4) is connected to the holes on the Bracket Post VGK 110 (1b) according to the dimensions of the cantilevered parapet. (Fig. A4.02b)

- Never attach the Kicker AV 111 (2b) between the fixing points of the Platform Cantilever Beam VGK 170 (4). (Fig. A4.02c)
- Before demolition work begins or in the case of strong vibrations, the Kicker AV must be secured against unintentional turning. (see Section A9)

The spindling-out length of the Adj. Base Plate 38-80/55 (9) is to be kept to an absolute minimum.

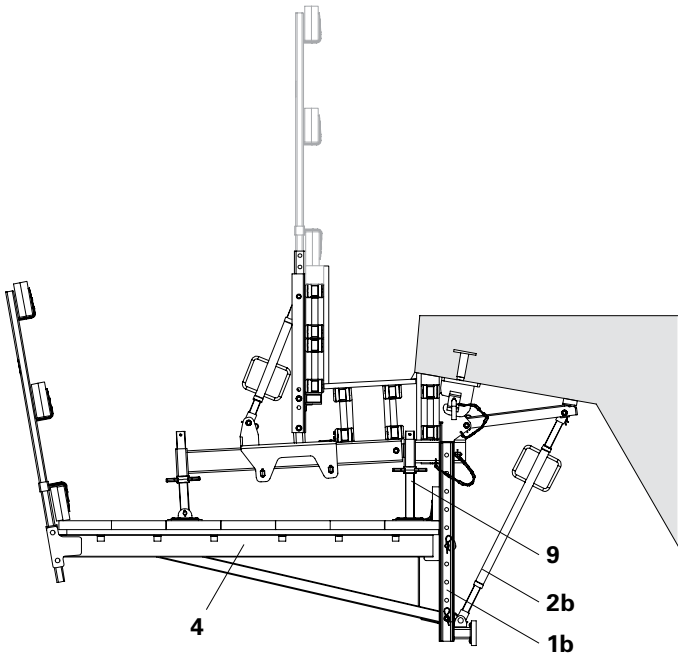


Fig. A4.02a

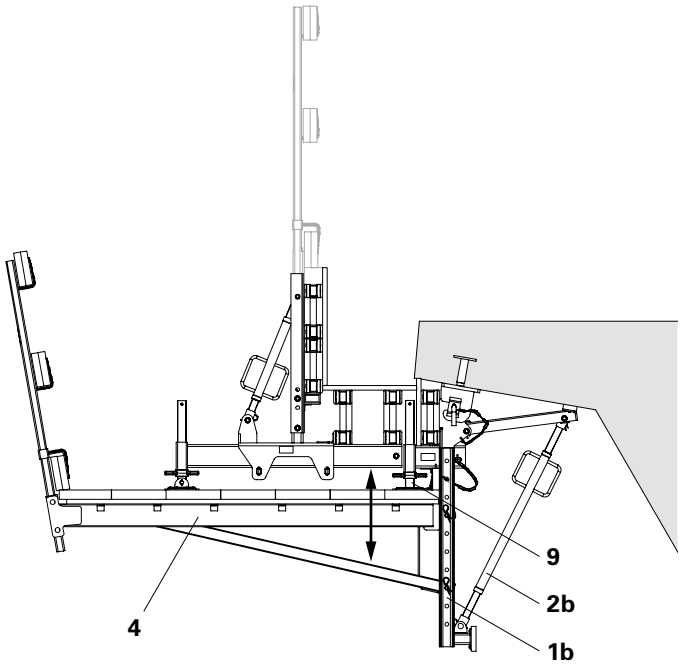


Fig. A4.02b

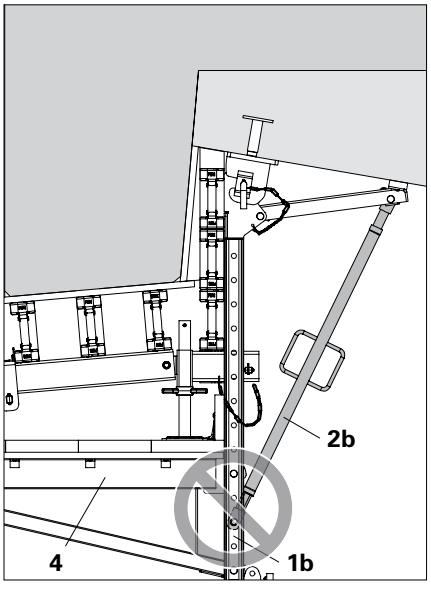


Fig. A4.02c

Cantilevered Parapet with Bracket Post VGK 139

Assembly with Bracket Post VGK 139 and Kicker AV 140

- The Kicker AV 140 (2c) is always connected to the base of the Bracket Post VGK 139 (1c) by means of bolts and cotter pins. (Fig. A4.03a)
- The Platform Cantilever Beam VGK 170 (4) is connected to the holes on the Bracket Post VGK 139 (1c) according to the dimensions of the cantilevered parapet. (Fig. A4.03b)

- Never attach the Kicker AV 140 (2c) between the fixing points of the Platform Cantilever Beam VGK 170 (4). (Fig. A4.03c)
- Before demolition work begins or in the case of strong vibrations, the Kicker AV must be secured against unintentional turning. (see Section A9)

The spindling-out length of the Adj. Base Plate 38-80/55 (9) is to be kept to an absolute minimum.

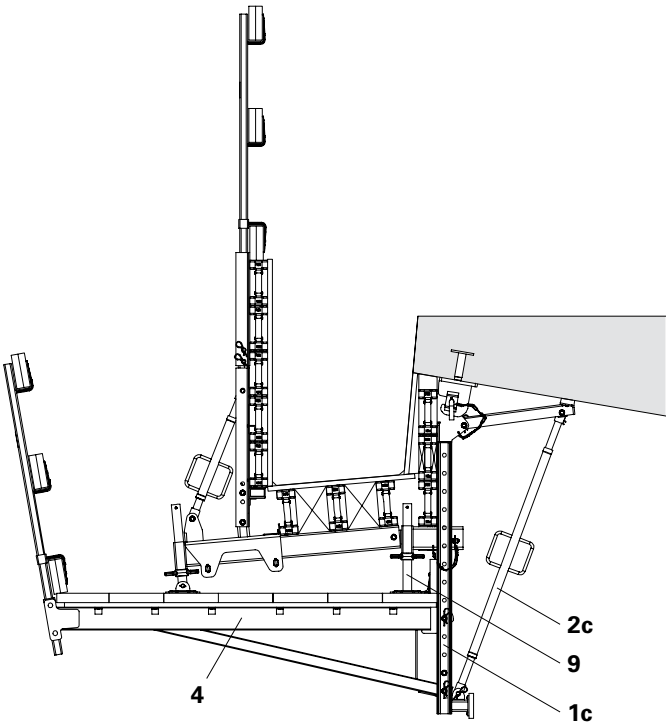


Fig. A4.03a

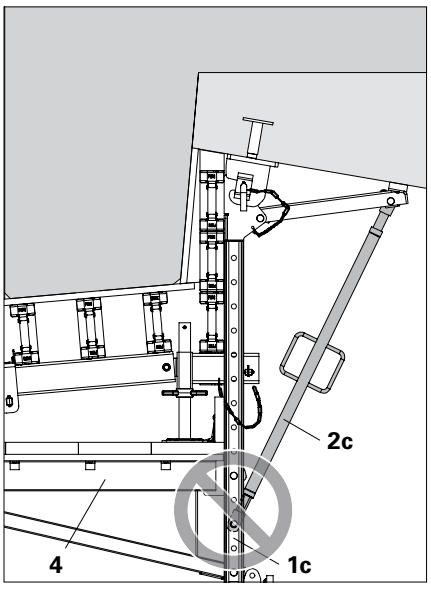


Fig. A4.03c

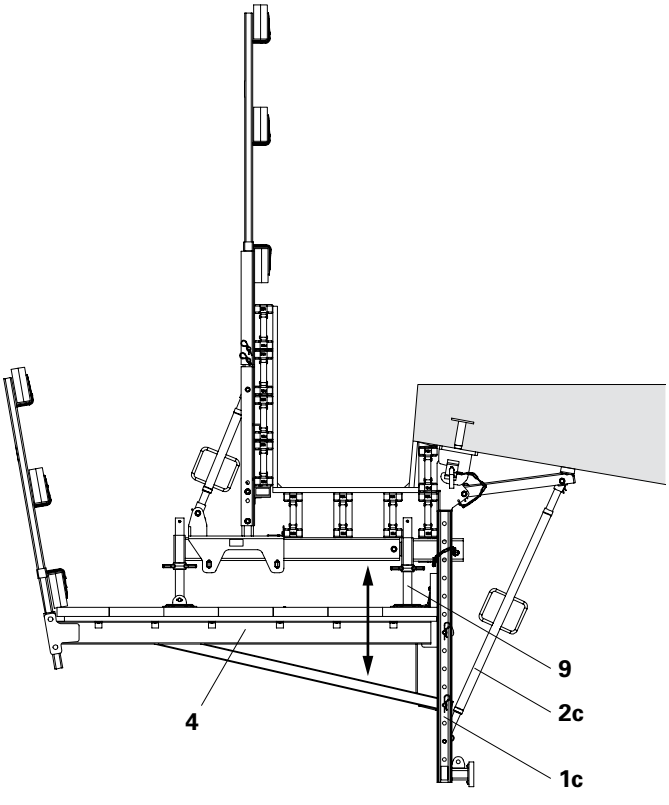
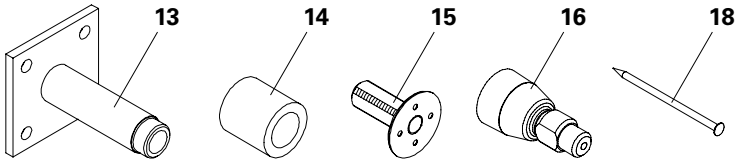


Fig. A4.03b

On the cantilever (new structures)

Anchor Sleeve M24
The Anchor Sleeve M24 is also embedded when concreting the cantilevered parapet.



Required components per tie point:

13	Anchor Sleeve M24	1x
14	Cone FRC 32/52, c = 40	1x
15	Anchor Positioning Stud M24 x 65	
	Alternatively:	1x
17	Threaded Cone M24	1x
18	Wire Nail 4.6 x 130	1x

- Constructional requirements for use of the Anchor Sleeve M24 with cantilevered parapet systems, see dimensioning information for the VARIOKIT VGK.
- Permissible widths of influence on cantilevers: see design information for the VARIOKIT VGK.
- Keep thread of the Anchor Sleeve M24 free of rust and dirt.

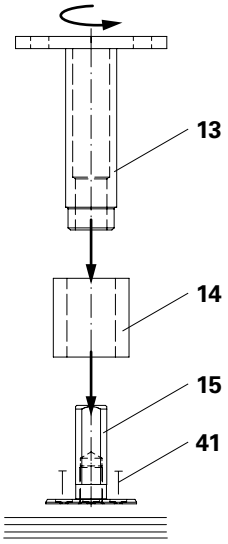


Fig. A5.01

Installation with the Anchor Positioning Stud

1. Fix the Anchor Positioning Stud M24 x 65 (15) to the formlining by means of 4 wire nails 3 x 80 (41).
   Tale into consideration edge spacing "a". (Fig. A5.01 + A5.01a)
2. Push Cone FRC 32/52, c = 40 (14) over the thread of the Anchor Positioning Stud M24 x 65 (15).
3. Screw Anchor Sleeve M24 (13) on to the Anchor Positioning Stud M24 x 65 (15) as far as possible. (Fig. A5.01)
4. Secure the Anchor Sleeve M24 (13) in the reinforcement using tie wire.

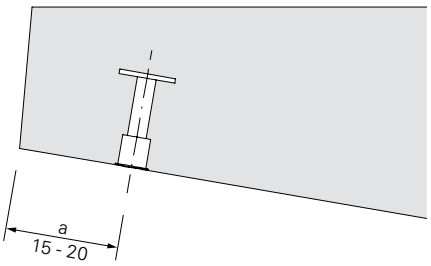


Fig. A5.01a

Installation with the Threaded Cone

1. Check anchor installation components for signs of damage and replace if necessary.
2. Insert wire nail 4.6 x 130 (18) into the Threaded Cone M24 (17).
3. Position the Threaded Cone M24 (17) on the formlining and completely hammer in the wire nails 4.6 x 130 (18). (Fig. A5.02a)
4. Screw in the Anchor Sleeve M24 (13) as far as possible, at 90° to the formlining. (Fig. A5.02b)
5. Secure the Anchor Sleeve M24 (13) in the reinforcement with tie wire to ensure that it does not change its position during concreting.

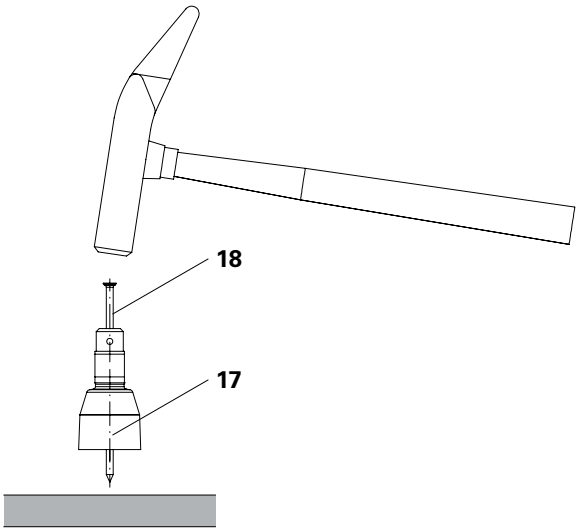


Fig. A5.02a

Check installation

- Distance to the edge
- Anchor spacings
- Ensure the Anchor Sleeves are completely screwed in
- Planned position

Checking of the anchors and reinforcement can be done at the same time.

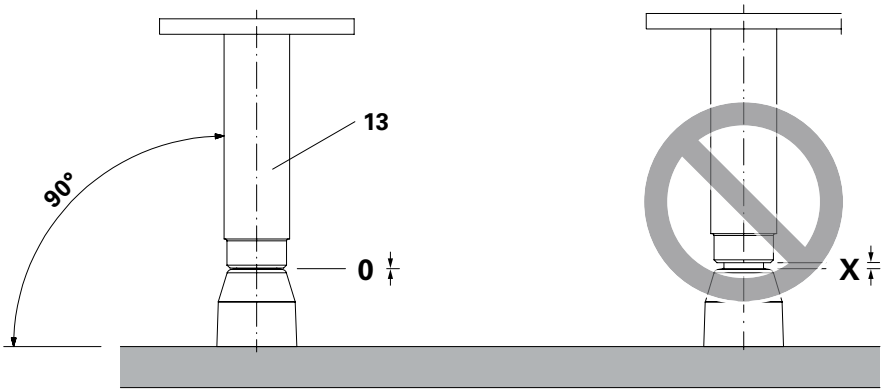


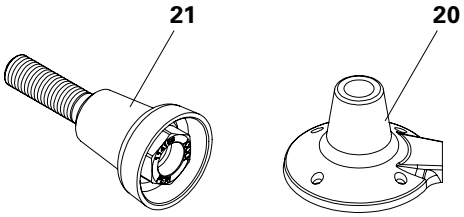
Fig. A5.02b

On the abutment

Screw-On Cone-2 M24/DW 20
The Screw-On Cone is also embedded when concreting the abutment.

Required components per tie point

20	Threaded Anchor Plate DW 20	1x
21	Screw-On Cone-2 M24/DW 20	1x



- Constructional requirements for the use of the Screw-On Cone-2 M24/DW 20, see design information for the VARIOKIT VGK.
- Permissible width of influence on abutments: see design information for the VARIOKIT VGK.

Assembly

1. Fully insert the Screw-On Cone-2 M24/DW 20 (21) into the Threaded Anchor Plate DW 20 (20).
   (Fig. A5.04a)
   Anchoring depth h = 15.5 cm.
   (Fig. A5.04b)

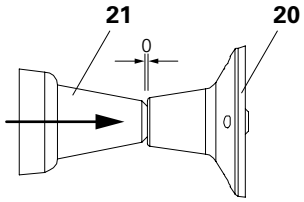


Fig. A5.04a

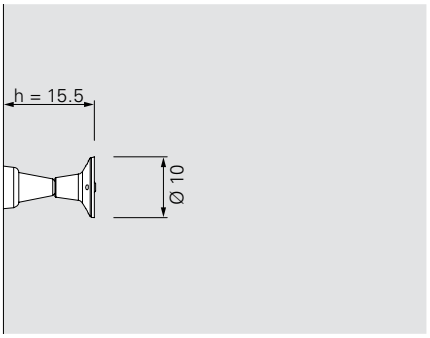


Fig. A5.04b

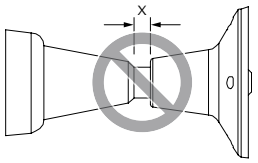


Fig. A5.04c

Check installation

- Anchor spacings
- Ensure the Anchor Sleeves are completely screwed in
  (Fig. A5.04a + A5.04c).
- Planned position

Checking of the anchors and reinforcement can be done at the same time.

Mounting with the Anchor Positioning Stud M24

Required components per tie point:

20	Threaded Anchor Plate DW 20	1x
21	Screw-On Cone-2 M24/DW 20	1x
22	Anchor Positioning Stud M24	1x

Assembly

1. Fix the Anchor Positioning Stud M24 (22) to the marked position with 4x wire nails 3 x 80 (41). Take into consideration the minimum distance to the edge. (Fig. A5.05)
2. Tightly screw pre-assembled anchors (20 + 21) on to the Anchor Positioning Stud M24 (22). (Fig. A5.06)
3. Firmly connect the Threaded Anchor Plate DW 20 (20) to the reinforcement to ensure a secure position.

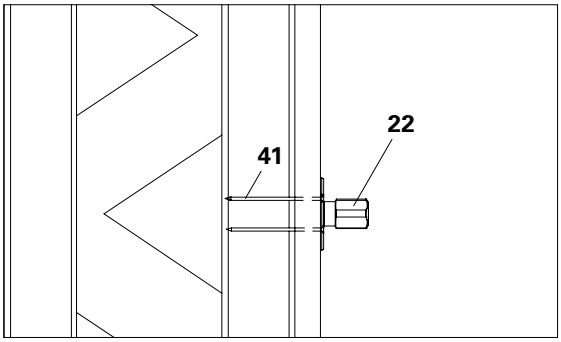


Fig. A5.05

Check assembly

- Height
- Anchor spacings
- Anchoring depth h
- Alignment according to specifications

Checking of the anchors and reinforcement can be done at the same time.

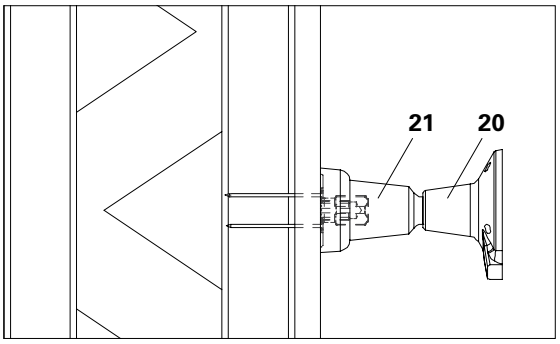


Fig. A5.06

- A more stable mounting is achieved through the installation of the Anchor Positioning Plate, see A5 “Assembly of Advancing Bolt M24”.
- In this case, the distances from the holes to be drilled to the steel struts or beams of the formwork must be large enough.

Mounting with the Advancing Bolt M24

Preparation

1. Check the required space for the Anchor Positioning Plate M24 (45). A lateral clearance of 3 cm or 4 cm is required.
2. Determine the set position and drill Ø 25 mm hole from the front of the formwork. (Fig. A5.07)
3. Mount the Anchor Positioning Plate M24 (45) on the formlining using 4x wood screws DIN 571 6 x 20 (47). (Fig. A5.08)

Assembly

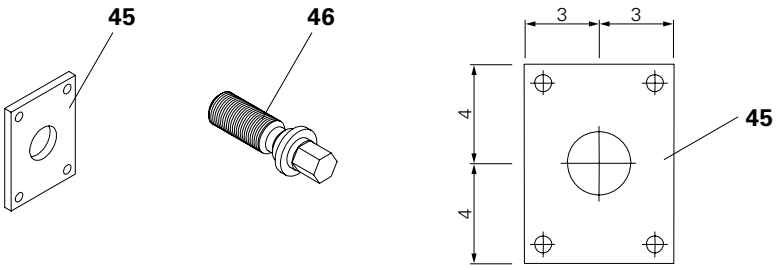
1. Insert the Advancing Bolt M24 (46) from the rear side of the formlining through the drilled hole.
2. From the front side of the formlining, tightly screw on the anchor (20 + 21). (Fig. A5.09)
3. Firmly connect the Threaded Anchor Plate (20) to the reinforcement to ensure a secure position.

Check assembly

- Height
- Anchor spacings
- Anchoring depth h
- Alignment according to specifications

Checking of the anchors and reinforcement can be done at the same time.

If there is a formwork girder positioned at the rear of the anchoring, "Assembly with Anchor Positioning Stud M24" can be used.



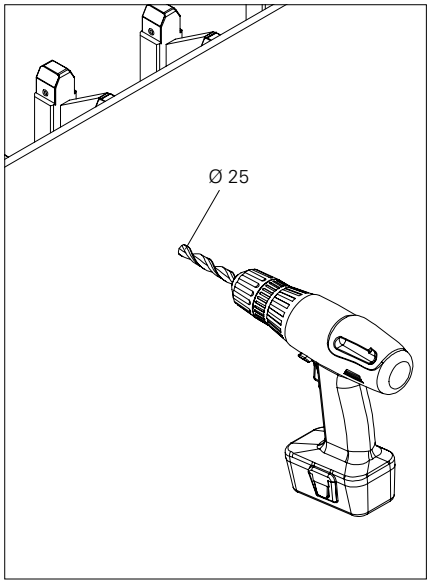


Fig. A5.07

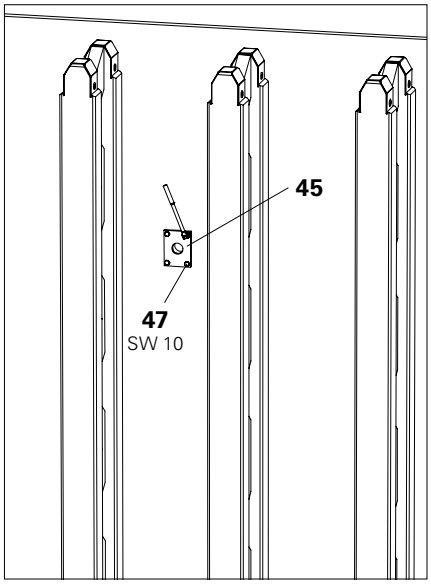


Fig. A5.08

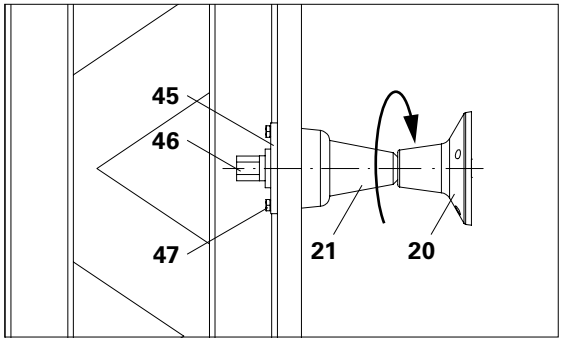


Fig. A5.09

A5 Anchoring

Alternative anchoring
For anchorage on alternative anchoring (according to General Building Inspectorate Approval no. Z-21.6-1764)

Required components per tie point:

12	Suspension Head VGK	1x
27	B15 Anchor Lock VGK	1x
28	B15 Anchor VGK	1x

Assembly
1. Tighten the Suspension Head VGK (12) with the B15 Anchor VGK (28).
2. Secure the B15 Anchor VGK (28) against twisting with the B15 Anchor Lock VGK (27).
   (Fig. B5.10a + B5.10b + B5.10c)

Check assembly
- Alignment according to specifications

Checking of the anchors and reinforcement can be done at the same time.

Close the hole after use by means of filler mortar.

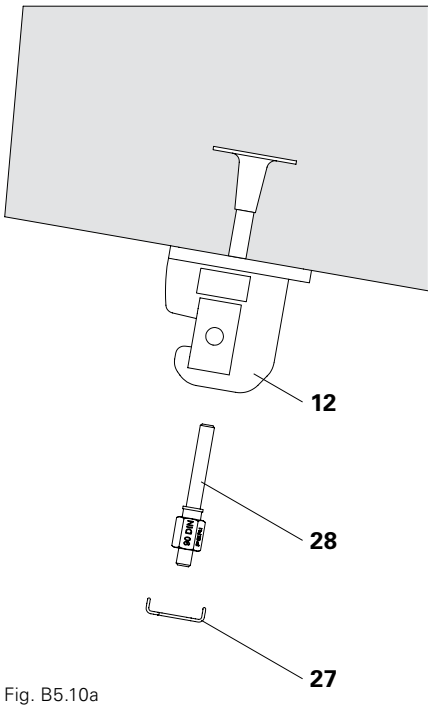


Fig. B5.10a

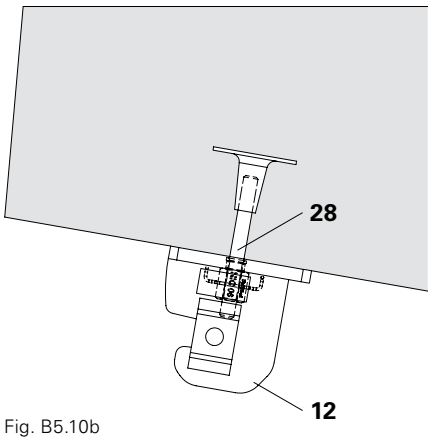


Fig. B5.10b

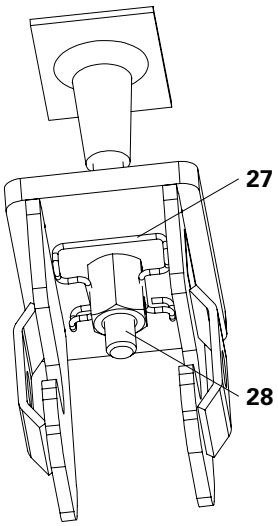


Fig. B5.10c

Removal and closure

Danger

During assembly, leading edges are present!
There is a risk of falling off the cantilevered parapet.

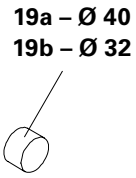
⇒ The removal and closure of the anchor holes takes place from a safe and secure working area, e.g.
- telescopic working platform.
- temporary working scaffold.
- personal protective equipment to prevent falling from a height (PPE)

Dismantling on the cantilever

1. Remove bolt ISO 4014-M24 x 100-8.8 (16) from the Suspension Head VGK (12).
2. Remove the Suspension Head VGK (12).

Closure

1. Clean anchor hole.
2. Mix 2-component Repoxal Glue (31) according to the manufacturer's instructions.
3. Submerge the Plug FRC Ø 32 (19b) for the Anchor Positioning Stud M24 or Ø 40 (19a) for the Threaded Cone M24 on one side into the 2-component Repoxal Glue (31).
4. Tap the Plug FRC (19) into the anchor hole using a rubber-headed hammer until flush with hole.
5. Remove adhesive residue with a spatula. (Fig. A5.11a + A5.11b)



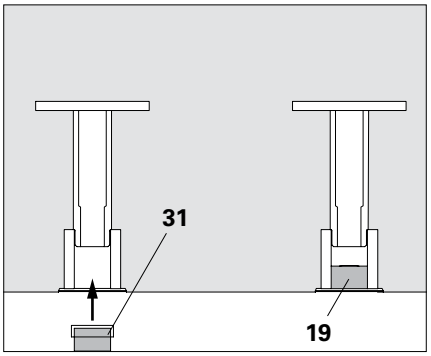


Fig. A5.11a

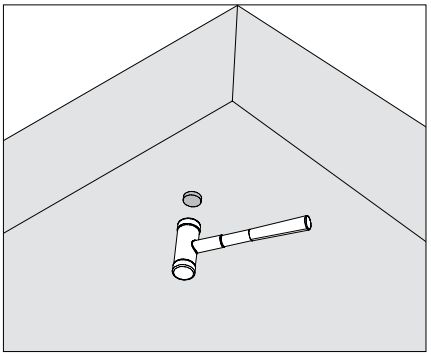


Fig. A5.11b

Dismantling on the abutment

1. Remove bolt ISO 4014 M24 x 70-10.9 (23) from the the Suspension Head VGK (12).
2. Remove the Suspension Head VGK (12).
3. Release Screw-On Cone-2 M24/DW 20 (21) by means of socket wrench SW 36.
4. Screw out the Screw-On Cone-2 M24/DW 20 (21) by hand. (Fig. A5.12 + A5.13)

Closure

1. Clean the anchor hole.
2. Close the anchor hole with a suitable cone, e.g. PERI Concrete Cones. (Fig. A5.14)

Observe user information for Concrete Cones with Sealing Compound-3.

For architectural concrete, the anchor holes can be closed with PERI Sealing Cones KK.

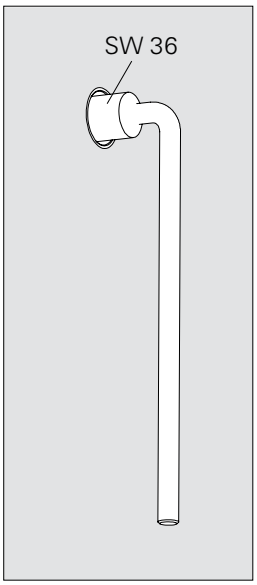


Fig. A5.12

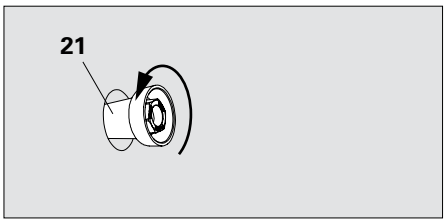


Fig. A5.13

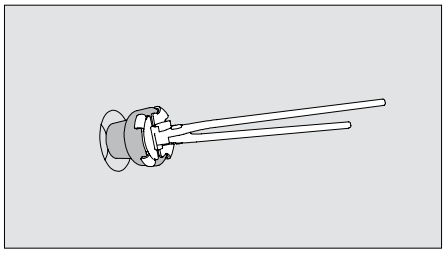


Fig. A5.14

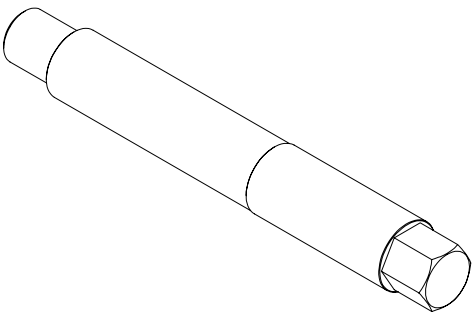
Refurbishment on the cantilever

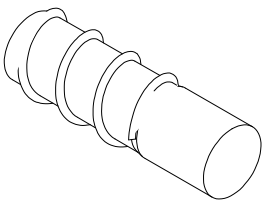
Danger

The full load-bearing capacity is reached after the composite mortar has hardened!
The Cantilevered Parapet Bracket can fall.

⇒ Access the Cantilevered Parapet Bracket only after the concrete has hardened.

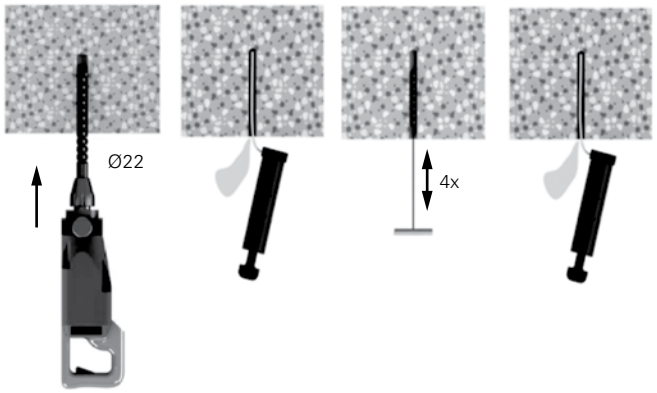
Safety data sheet is to be taken into consideration.





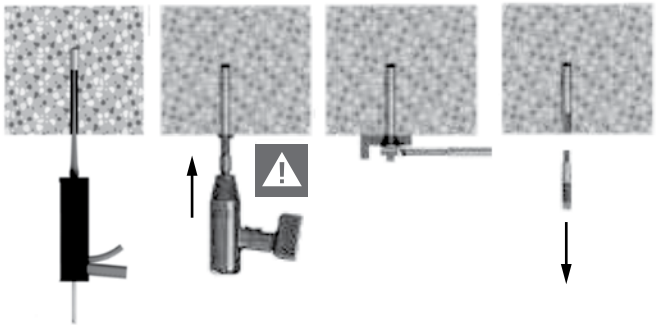
Preparing the drilled hole

1. Ensure that the drilled hole is at right-angles to the concrete surface. Depth of drilled hole 160 mm, Ø 22.
2. Check the depth of the drilled hole.
3. Blow out the drilled hole with the Blow-Out Pump (48) from below.
4. Brush out the drilled hole with D24 Steel Cleaning Brush (49) at least 4 times.
5. Blow out the drilled hole with the Blow-Out Pump (48) from below.



Mounting the refurbishment anchor

1. Inject Composite Mortar CF-T 300 V (50).
2. Screw the Anchor Bolt M16/M24 x 50 (51) and Chemical Anchor Sleeve TSM BC 22 x 75 IM 16 (52) tightly together.
3. Screw the unit into the drilled hole with an impact wrench (nominal torque 600 Nm). (Fig. A5.15)
   → After reaching the designated screw-in depth, the composite mortar must appear on the concrete surface.
   → Enbedment mark is the start of the thread on the M24.
   → VGK assembly loads can be immediately accommodated.
7. Fix the Suspension Head VGK using the Nut ISO 7040 M24-8.



Dismantling

1. Screw out the Anchor Bolt M16/M24 x 50 (51) after use. (Fig. A5.16)
2. Close the drilled hole.

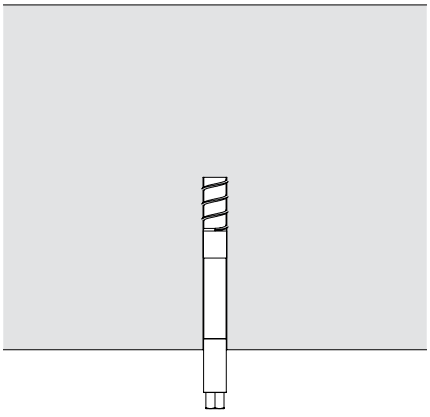


Fig. A5.15

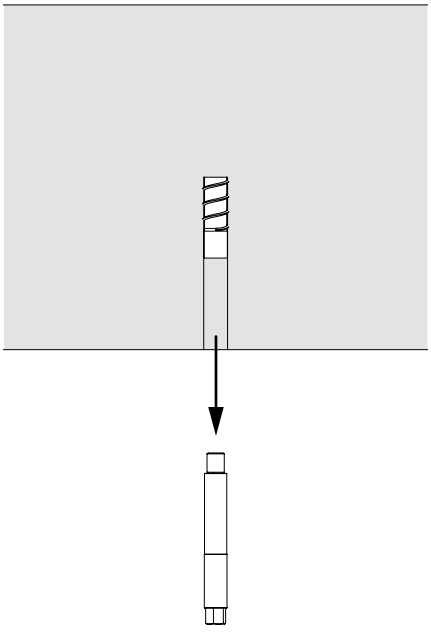


Fig. A5.16

Take into consideration country-specific standards and regulations.

Platform decking

Planking according to EN 12811 and DIN 4420-1 respectively.

- Planking (35) spans a minimum of 2 bays, with offset joints.
- Fix planks to each platform beam using wire nails or wood screws (36). (Fig. A6.01)
- Secure cantilevered planking against lifting.
- With installation according to DIN 4420-1 Table 3, planking can be used as a cover which is suitable to catch falling objects. Ensure tightness.

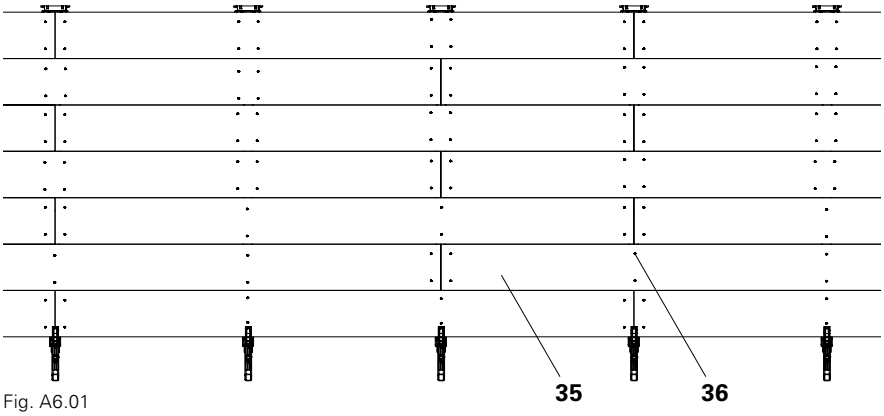


Fig. A6.01

Safety scaffold

In the absence of safety measures against falling and fall heights h> 1.00 m at the edge of the bridge, the planking is to be installed as safety decking according to DIN 4420-1.

- Installation of planking depending on the fall height h and span in accordance with DIN 4420-1, Table 2. (Fig. A6.02)
- Depending on the span, a double thickness may be necessary.

For planking widths > 24 cm and fall heights h ≤ 1.50 m:

Plank thickness	max. span
4.0 cm	1.00 m
5.0 cm	1.30 m
Double thickness	
2 x 4.0 cm	1.60 m
2 x 5.0 cm	2.20 m

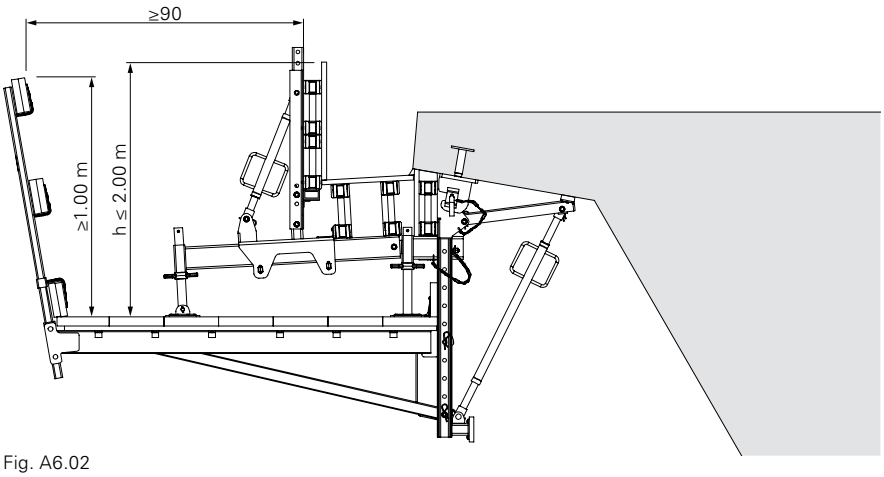


Fig. A6.02

Side protection

Guardrails are to be mounted on the working scaffold according to EN 12811.

- Fix Guardrail Boards (33) and Toeboards (34) to the Guardrail Posts HSGP-2 (29) with wire pins or wood screws (36). (Fig. A6.03)
- For partial or complete enclosure of the side protection, the perm. width of influence of the Guardrail Post can restrict the bracket spacing.

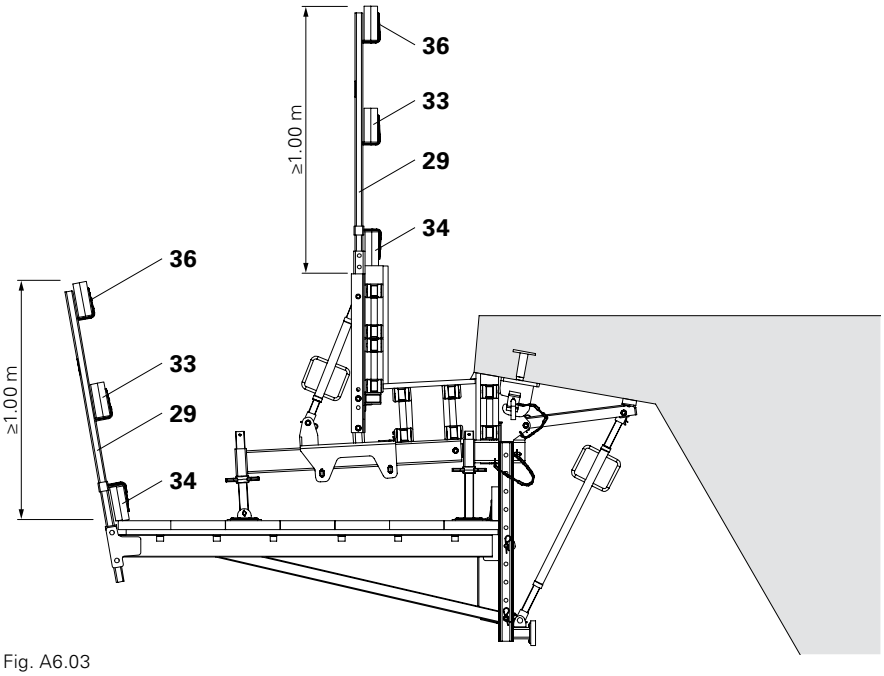


Fig. A6.03

Use as formwork scaffold

In case of a storm, the Cantilevered Parapet Bracket VGK must be free of materials and tools as well as being secured against tipping.
Example using timbers (37).

Cantilever
(Fig. A7.01)

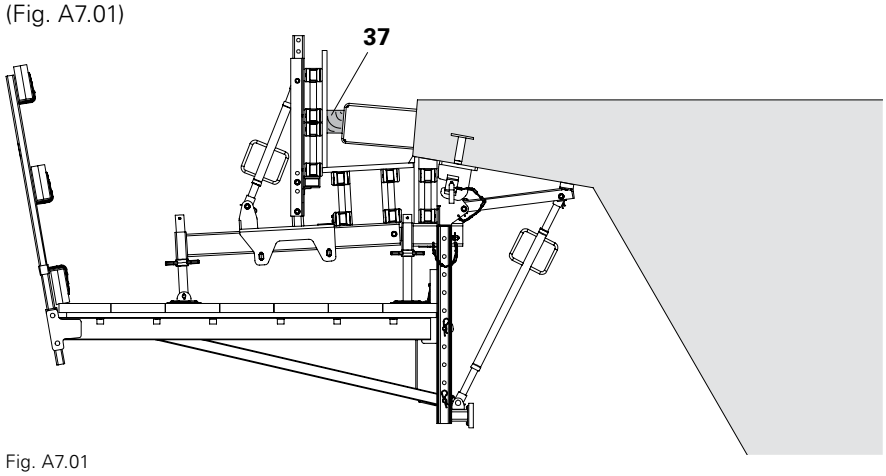


Fig. A7.01

Vertical use on abutments
(Fig. A7.02)

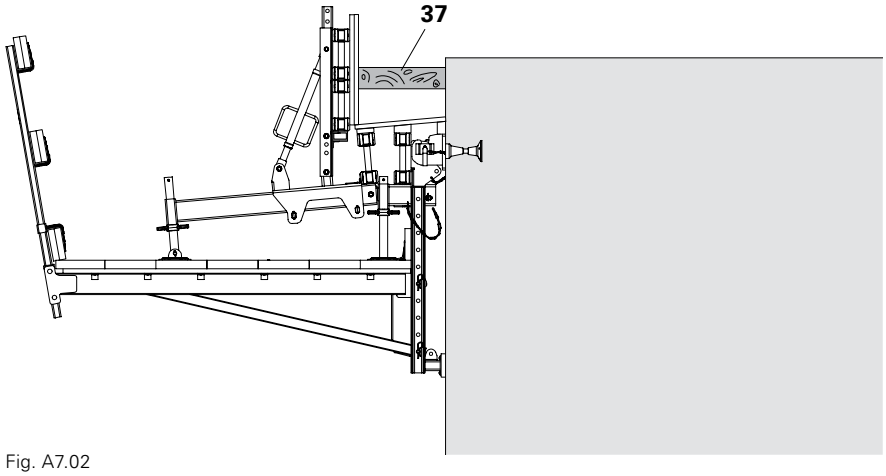


Fig. A7.02

Use as a working platform

In case of a storm, the Cantilevered Parapet Bracket VGK must be free of materials and tools as well as being secured against tipping.
Example using timbers (37).

Cantilever
(Fig. A7.03)

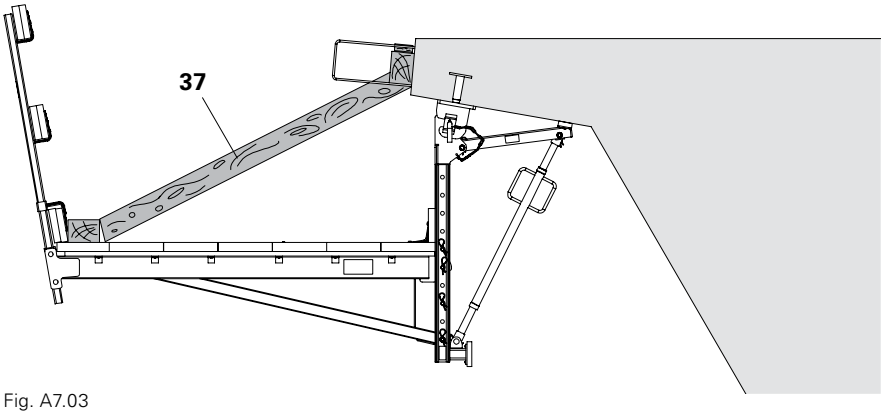


Fig. A7.03

Vertical use on abutments
(Fig. A7.04)

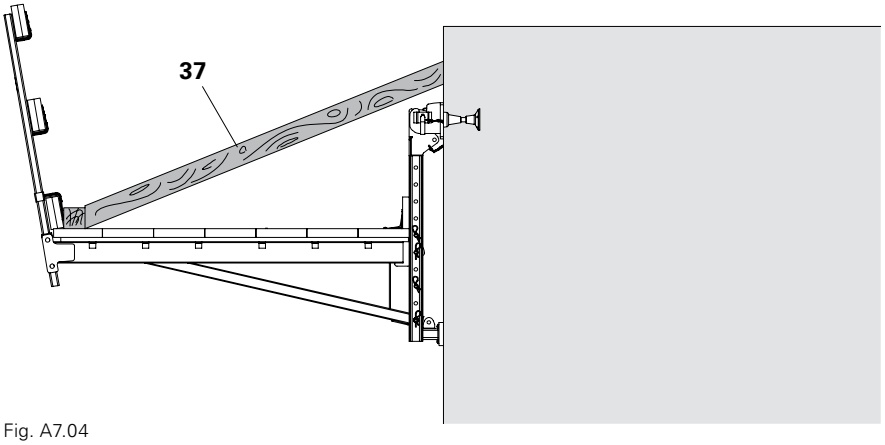


Fig. A7.04

A8 Horizontal Bracing for s > 3 %

- For horizontal bracing, the Brackets are always connected in pairs to the scaffold tubes and diagonal planking.
- The diagonally-positioned plank (38) is force-locked against the Bracket Post VGK in the direction of the inclination.
- Take into consideration the longitudinal inclination s.

Diagonal planking

Required components:

38	Plank 20 x 4	1x
39	Torx 6 x 80	8x
40	Height Compensation	1x

Assembly

1. Prepare plank 20 x 4 (38) for a force-locked connection.
2. Position plank 20 x 4 (38) diagonally between two Brackets on the decking and fix with Torx 6 x 80 (39).
3. Mount the Height Compensation (40).
4. Fix the Formwork Fixing VGK 2 (5) and Formwork Support VGK (6), see B3.
5. Fix Adjustable Base Plates with two Torx 6 x 80 (39) respectively.

(Fig. A8.01)

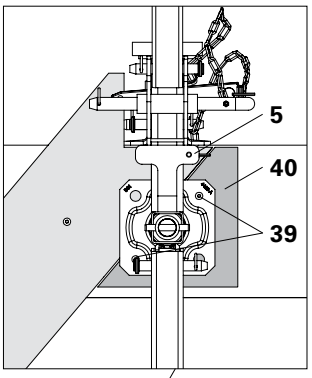


Fig. A8.01a

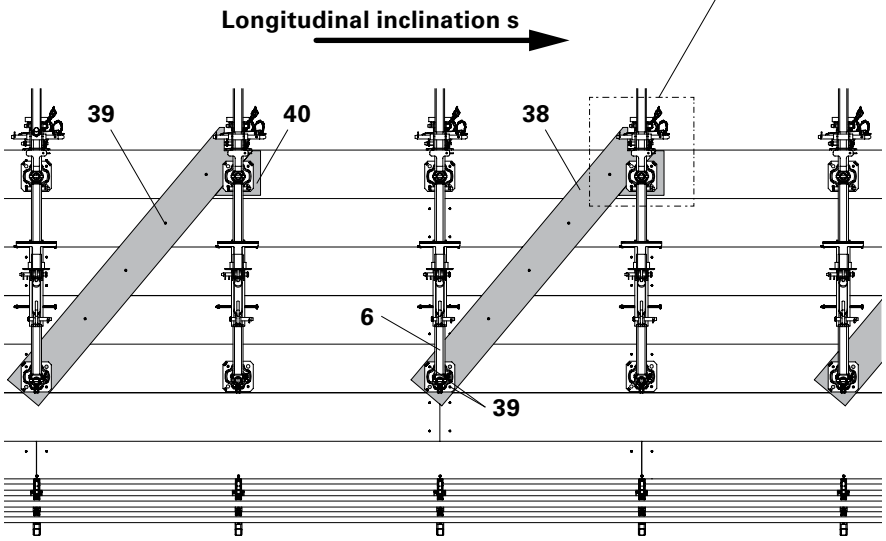


Fig. A8.01

A8 Horizontal Bracing for s > 3 %

Scaffold Tube

Required components:

10	Brace Connector VGK	2x
11	Steel Scaffold Tube Ø 48.3 x 3.2	1x

Assembly

1. Screw Brace Connector VGK (10) in to each Bracket Post VGK, M16 x 80 at the height of the decking.
2. Mount scaffold tube (11) on two couplings.
3. Align Brackets and tighten couplings, SW 19.

(Fig. A8.02)

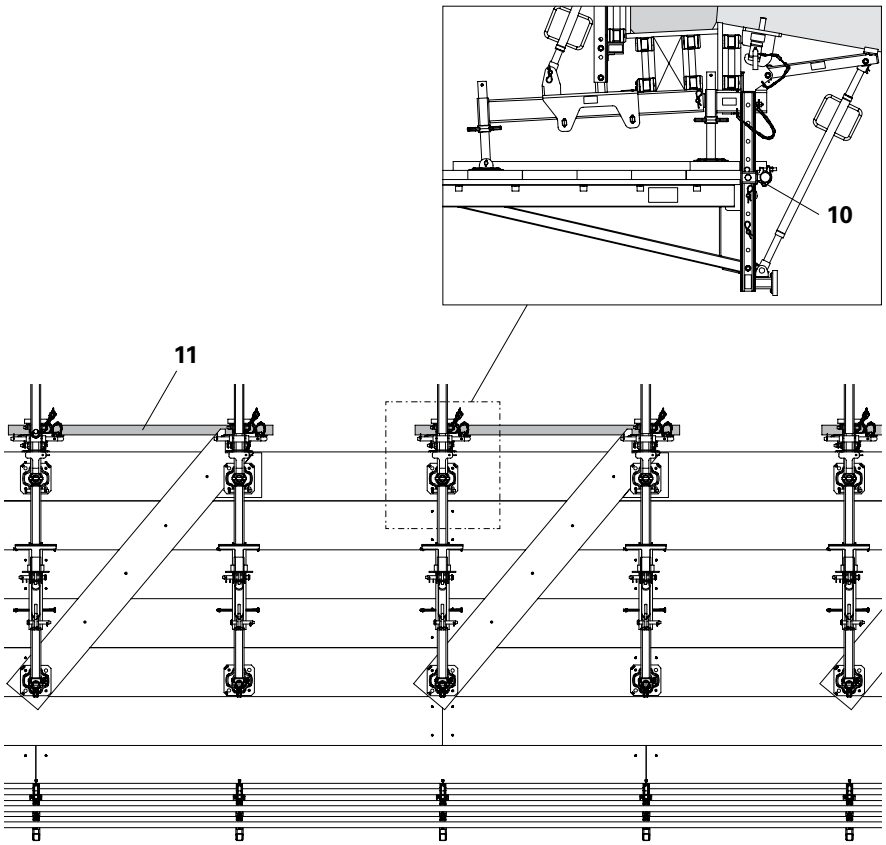


Fig. A8.02

A9 Horizontal Bracing for Demolition Work and Strong Vibrations

If the Cantilevered Parapet Bracket is used during demolition work or is subjected to strong vibrations, the Kicker AV must also be secured against twisting at the pressure point.

Assembly

1. Mount a Swivel Coupler RS 38/48 (23) at each Kicker AV (2) on the Spindle Sleeve.
2. Connect two Brackets respectively with a Scaffold Tube Steel Ø 48.3 x 3.2 (11).

(Fig. A9.01)

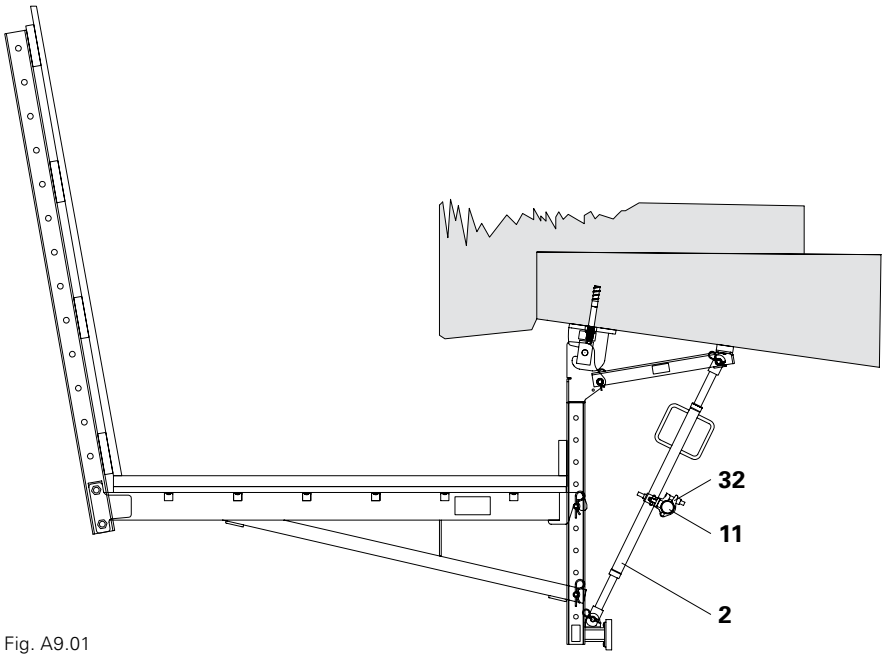


Fig. A9.01

A10 Inspecting the Bracket Cantilever VGK 50

The sliding capacity of the compression bearing on the Bracket Cantilever VGK 50 (3) must be checked before each use.

Bracket Cantilever is not to be used if the grouting is damaged.

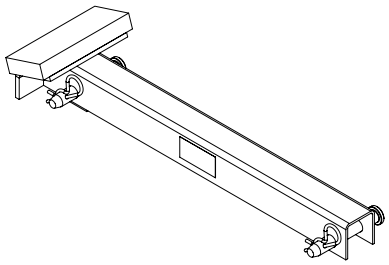
The inspection includes a visual and functionality check

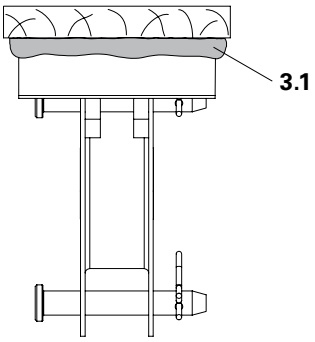
Purpose
Operational and functional reliability can be guaranteed due to the inspection carried out before the initial operations, as well as regularly occurring inspections.

Visual check
- Wear
- Cracks, grooves in the grouting (3.1).

Functional check
- Formlining moveable – approx. 2 mm forwards, back and twistable. (Fig. A9.01 – A9.03)
- Formlining automatically goes back to the starting position.

Measures
If any defects are identified during the safety check, they must be eliminated according to the instructions provided by the qualified person. A new inspection must then be performed.





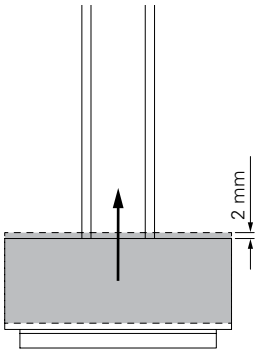


Fig. A9.01

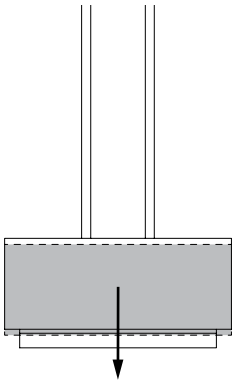


Fig. A9.02

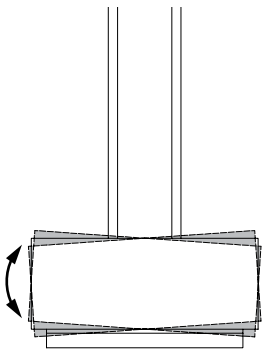


Fig. A9.03

Assembly on the cantilever

Danger

During assembly, leading edges are present!
There is a risk of falling off the cantilevered parapet.
⇒ Platform Unit and Bracket Unit are to be dismantled from a safe and secure working area, e.g.
- telescopic working platform.
- temporary working scaffold.
- personal protective equipment to prevent falling from a height (PPE)

The formwork unit is assembled and adjusted from the platform unit. Depending on the stage of construction, temporary safety measures to prevent falling may be required.

Removing the Anchor Positioning Stud

1. Straighten wire nails.
2. Retract formwork. Pull the wire nails through the formlining.
3. Remove the Anchor Positioning Stud M24 (22) from the Anchor Sleeve by means of an Allen Key SW 14.

(Fig. B1.01a)

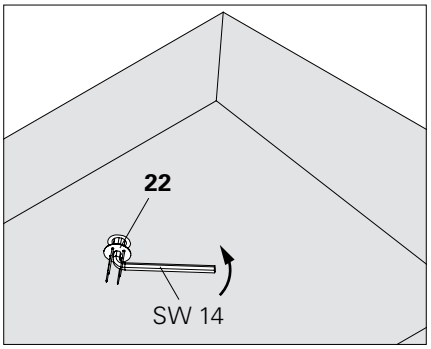


Fig. B1.01a

Removing the Threaded Cone

1. Retract formwork.
2. Push back wire nail with a hammer.
3. Screw out Threaded Cone M24 (17) from the Anchor Sleeve using a ratchet wrench and socket SW 22.

(Fig. B1.01b)

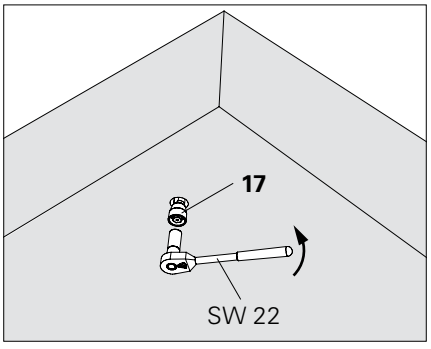


Fig. B1.01b

Assembly

1. Attach Suspension Head VGK (12) to the Anchor Sleeve M24 (13) by means of bolts ISO 4014-M24 x 100-8.8 (16). (Fig. B1.02)
2. Fix Bracket Cantilever VGK 50 (3) to the Bracket Post VGK (1) using bolts and cotter pins. (Fig. B1.03a)
3. Attach pre-adjusted Kicker AV (2) to the Bracket Cantilever VGK 50 (3) using bolts and cotter pins (3.2).
4. Attach pre-adjusted Kicker AV (2) to the Bracket Post VGK (1) using bolts and cotter pins (2.2). (Fig. B1.03b)
5. Attach Bracket Unit VGK (1) to the Suspension Head VGK (12) and secure by means of locking pins Ø 20 x 260 (1.1) and cotter pins 4/1.
6. Vertically align the Bracket Unit VGK (1) with Kicker AV (2). (Fig. B1.03c + B1.03d)

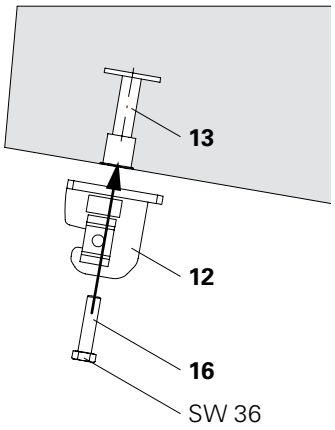


Fig. B1.02

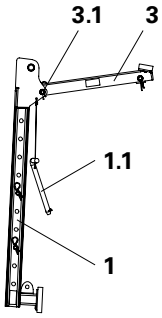


Fig. B1.03a

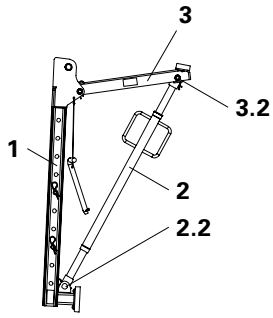


Fig. B1.03b

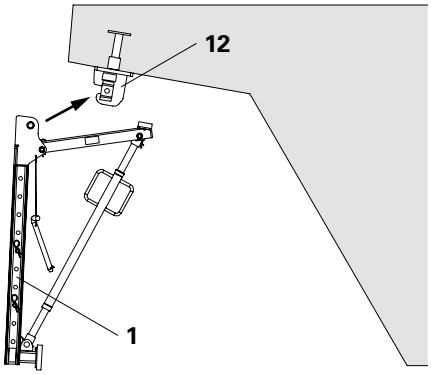


Fig. B1.03c

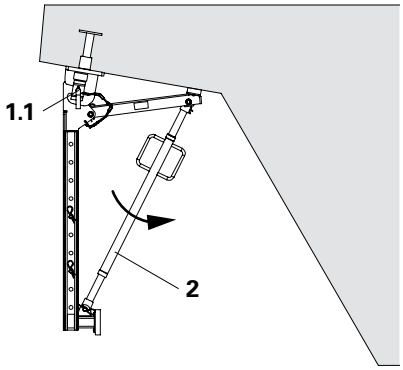


Fig. B1.03d

Assembly on the cantilever 35 – 75 cm – additional steps

1. Insert the Adj. Base Plate UJB 38-80/55 (9) into the Bracket Unit VGK (1) and vertically align.
2. Secure the Adj. Base Plate UJB 38-80/55 (9) against falling out and unintentional twisting. (Fig. B1.03d)

Assembly with Bracket Post VGK 70 – additional steps

Cantilever 35 – 75 or abutment:

1. Bolt the Eye Nut RCS DW 15 (59) in the Bracket Post VGK (1) using bolts Ø 16 x 90 (60) and secure with cotter pins 4/1 (61). (Fig. B1.03e)

Cantilever ≥ 75 cm:

1. Attach the Eye Nut RCS DW 15 (59) to the Bracket Cantilever VGK 50 (3) and Bracket Post VGK (1) using bolts and cotter pins (3.1). (Fig. B1.03e)

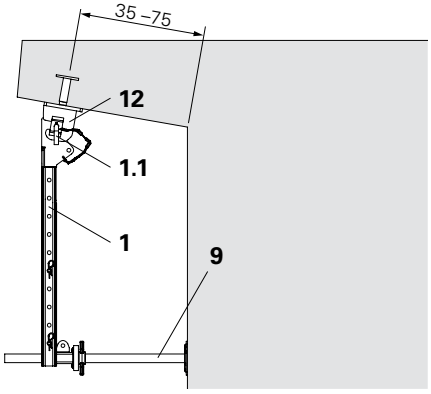


Fig. B1.03d

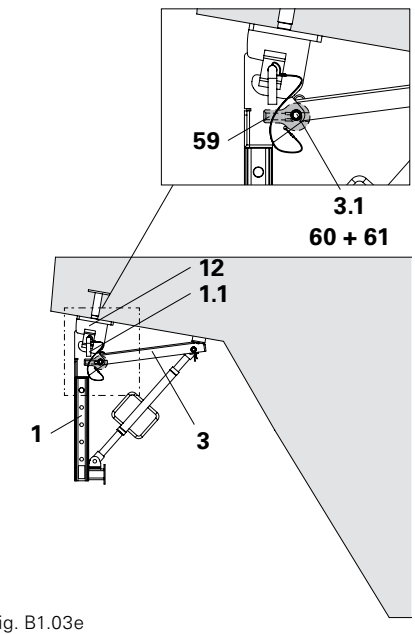


Fig. B1.03e

Assembly on the abutment

Removing the Advancing Bolt

1. Loosen and remove the Advancing Bolt M24 (41) from the rear side of the formlining, SW 19.
2. Remove formwork. (Fig. B1.04)

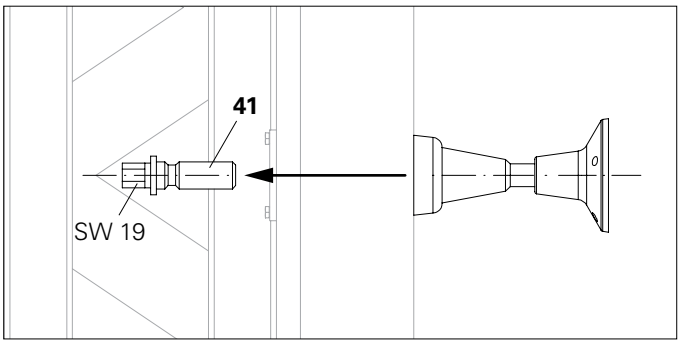


Fig. B1.04

Assembly

1. Fix the Suspension Head VGK (12) to the Screw-On Cone-2 M24/DW 20 (21) using bolts ISO 4014 M24 x 70-10.9 (23). (Fig. B1.05)
2. Attach Bracket Post VGK (1) to the Suspension Head VGK (12) and secure by means of locking pins Ø 20 x 260 (1.1) and cotter pins 4/1. (Fig. B1.06a + B1.06b)

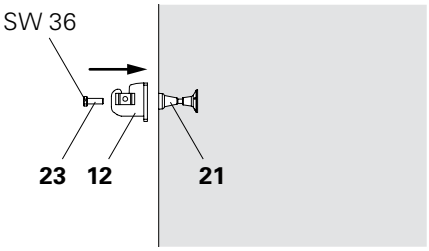


Fig. B1.05

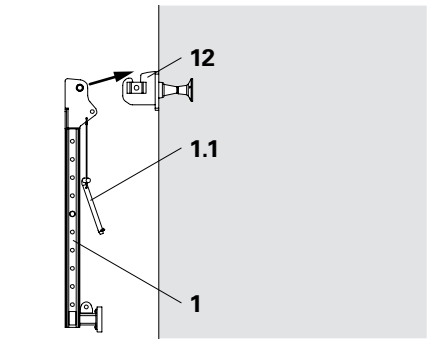


Fig. B1.06a

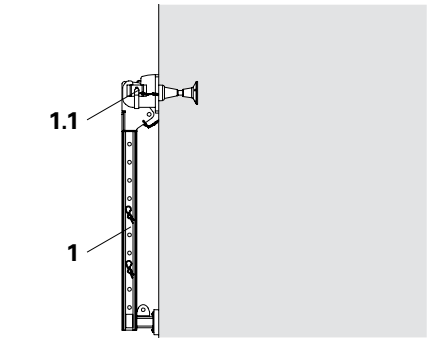


Fig. B1.06b

Assembling the Platform Cantilever Beam VGK

1. Position top bolt (1.2) in the Bracket Post VGK at the height of the platform.
2. Remove bottom bolt (1.3).
3. Mount Platform Beam (4) on the bolts (1.2).
4. Secure with the bottom bolt (1.3). (Fig. B2.01)
5. Attach additional Platform Beams.
6. Install decking, see Section A6.

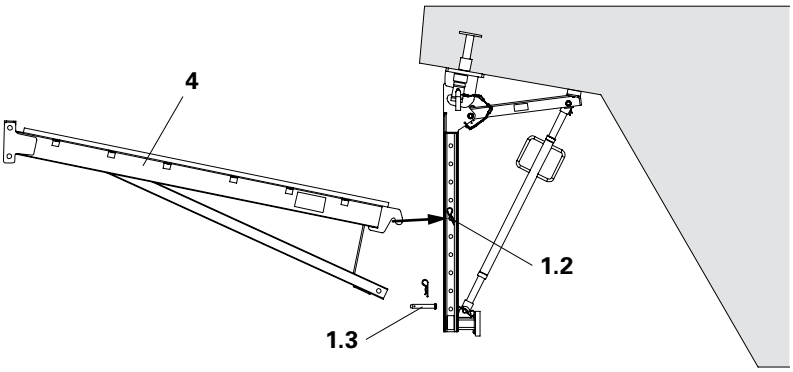


Fig. B2.01

Assembly of the Guardrails

1. Insert Guardrail Post HSGP-2 (29) in all Platform Cantilever Beam VGK 170 (4). (Fig. B2.02)
2. Mount and secure Guardrail Boards, see Section A6.

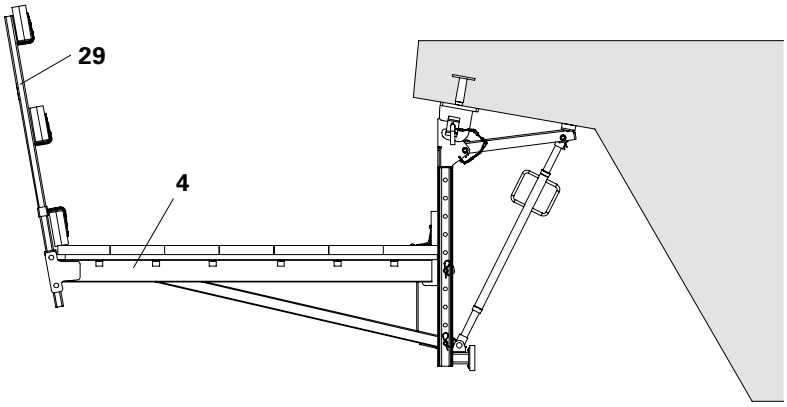


Fig. B2.02

Assembly with the Formwork Support VGK 60

Information

Higher concrete pressure on the Formwork Support VGK 60 if the cantilevered parapet is higher than 50 cm! This can lead to deformation of the Formwork Support VGK 60.

⇒ Centrally install the Kicker AV 82 and secure in order to prevent any movement, e.g. using shims or timbers. (Fig. B3.02a)

Fix the Side Formwork to the Formwork Post VGK 70 with wood screws.

Assembling the Formwork Support VGK

1. Screw the Tie Rod DW 15 (**56**) into Eye Nut RCS DW 15 (**59**).
2. Screw the Hex. Nut DW 15 30/50 (**57**) into the Tie Rod DW 15 (**56**) and adjust to match the required dimension beforehand.
3. Insert Hex. Nut DW 15 30/50 (**57**) into the Formwork Support VGK 60 (**6a**) and screw in until contact is made with the front plate (**6.5**).
4. Fix with the Formwork Support VGK 60 (**6a**) to the planking (**35**) using wood screws. (Fig. B3.01 + B3.01a)

Assembling the Formwork Post VGK for the Side Formwork

1. Attach Formwork Post VGK 70 (**7**) to the Formwork Support VGK 60 (**6a**) with bolts.
2. Fix the Kicker AV 82 (**2a**) in the rearmost hole in the Formwork Support VGK 60 (**6a**) and in the top hole in the Formwork Post VGK 70 (**7**) with bolts in each case.
3. Insert Beam Support (**7.1**) in the corresponding position. (Fig. B3.02)

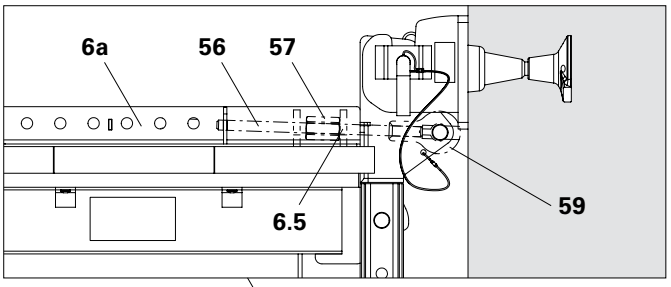


Fig. B3.01a

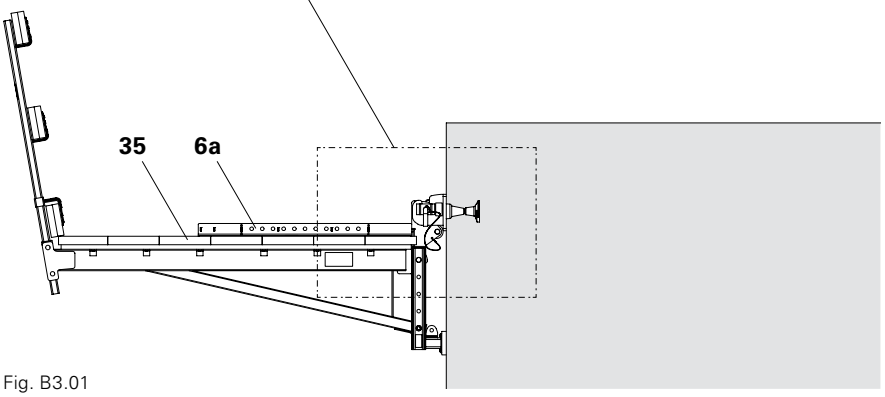


Fig. B3.01

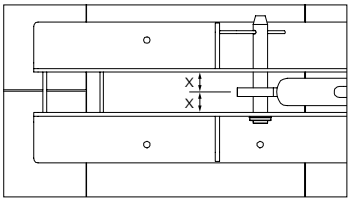


Fig. B3.02a

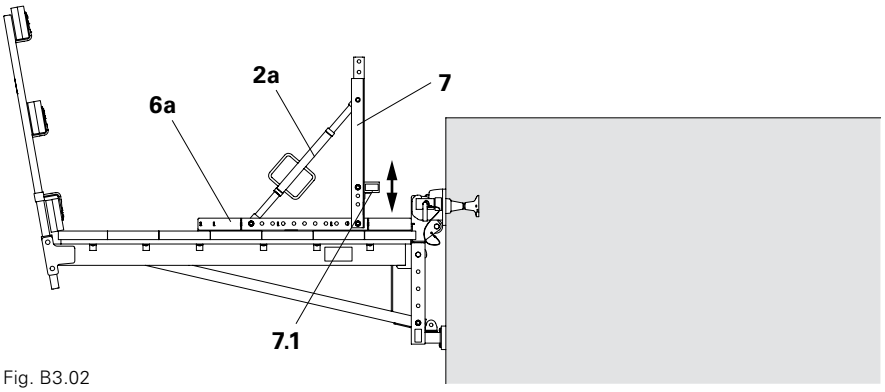


Fig. B3.02

Formwork assembly

1. Position the slab formwork at the required height by means of timbers and wedges.
   ⇒The formkining (**58**) must rest on the Beam Support (**7.1**) with x <30 cm.
2. Place the Side Formwork on the Beam Support (**7.1**) and slab formwork, and fix to Formwork Post VGK 70 (**7**) with wood screws (**36**). (Fig. B3.03)

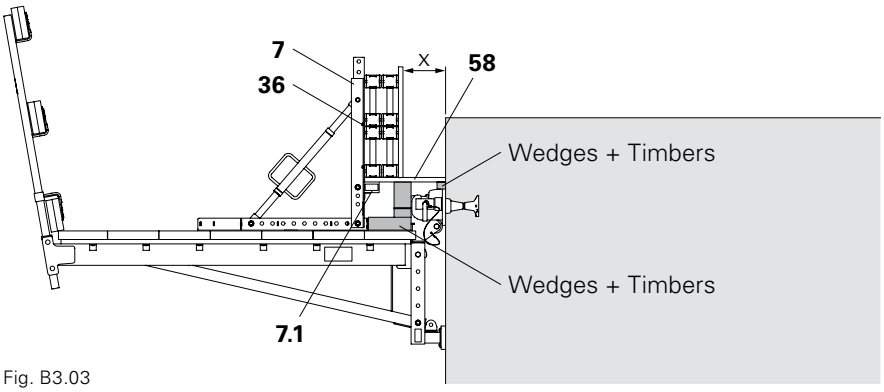


Fig. B3.03

Assembly with the Formwork Support VGK 100

Assembly of Formwork Fixing VGK

1. Release wedge (**5.1**).
2. Insert Formwork Fixing VGK 2 (**5**) into the Bracket Post VGK (**1**).
3. Adjust Formwork Fixing VGK 2 (**5**) to required height with the spindle.
4. Secure Formwork Fixing VGK 2 (**5**) with a wedge (**5.1**).
5. Position Internal Stopends (**54**) on the Formwork Fixing VGK 2 (**5**) and adjust. (Fig. B3.04)

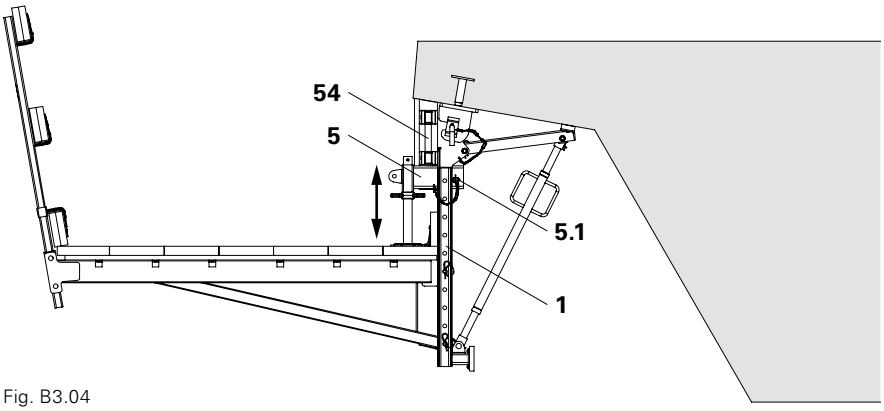


Fig. B3.04

Assembling the Formwork Support VGK

1. Fix the Formwork Support VGK (**6**) to the Formwork Fixing VGK 2 (**5**) with bolts (**6.4**).
2. Bring the guide carriage (**6.1**) into position.
3. Fix slab formwork to the guide carriage (**6.1**) by means of 2 Torx 6 x 60 (**55**) respectively.
4. Align slab formwork with the Articulated Spindle (**6.3**) and guide carriage (**6.1**).
5. Fix both wedges (**6.2**) on the guide carriage (**6.1**) using a sledge hammer (approx. 5 kg). (Fig. B3.05 + B2.05a)

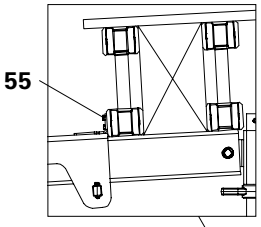


Fig. B2.05a

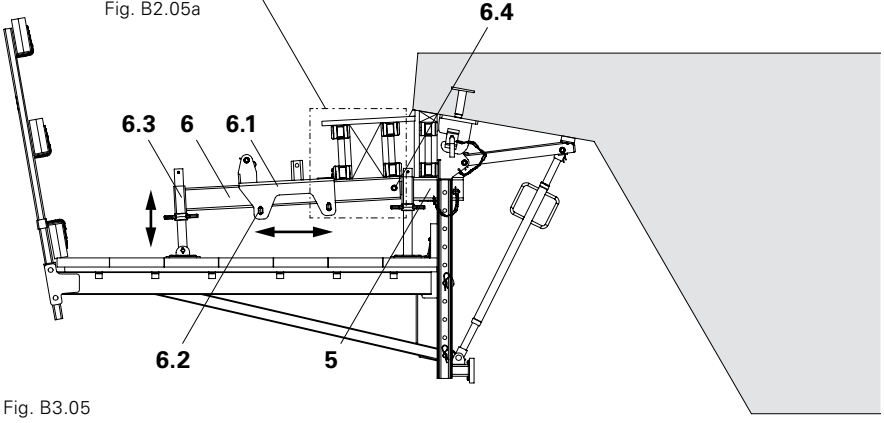


Fig. B3.05

Assembling the Formwork Post VGK for the Side Formwork

1. Attach Formwork Post VGK 70 (7) to the guide carriage (6.1) by means of bolts.
2. Fix Kicker AV 82 (3.5) to the guide carriage (6.1) and Formwork Post VGK 70 (7) with bolts.
3. Insert Beam Support (7.1) in the corresponding position. (Fig. B3.06 + B3.06a)

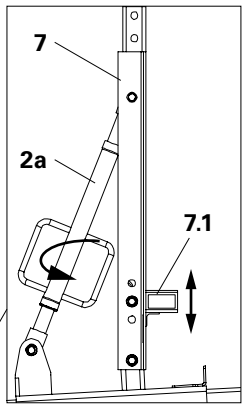


Fig. B3.06a

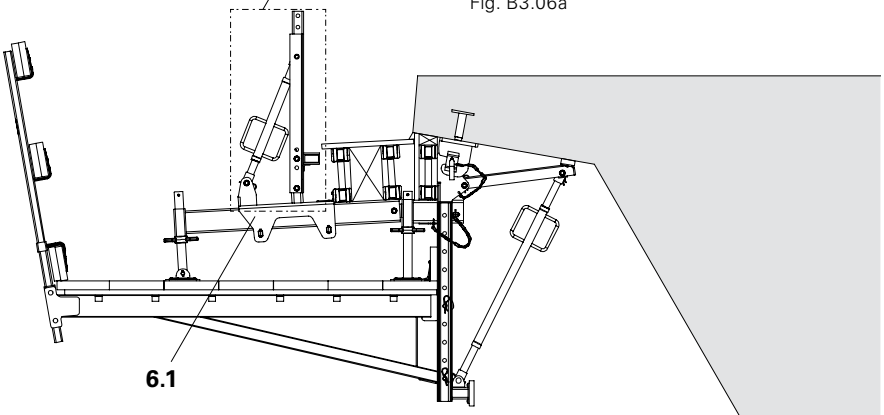


Fig. B3.06

Assembly of the Side Formwork

1. Place the Side Formwork on the Beam Support (7.1) and slab formwork, and fix to Formwork Post VGK 70 (7) with wood screws.
2. Align Formwork Post VGK 70 (7) with Kicker AV 82 (2a). (Fig. B3.07)

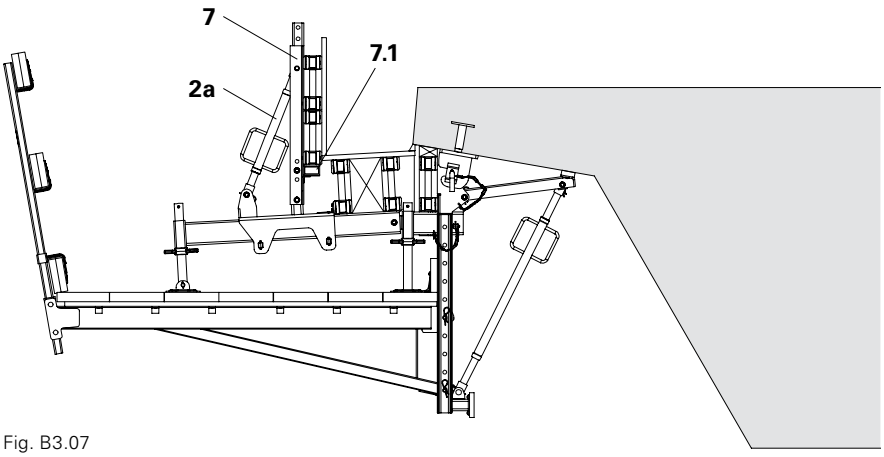


Fig. B3.07

Arrangement of the Formwork Girders

For optimal concreting results, offset the joints of the Formwork Girders for the Slab Formwork and Side Formwork. (Fig. B4.01)

Top view

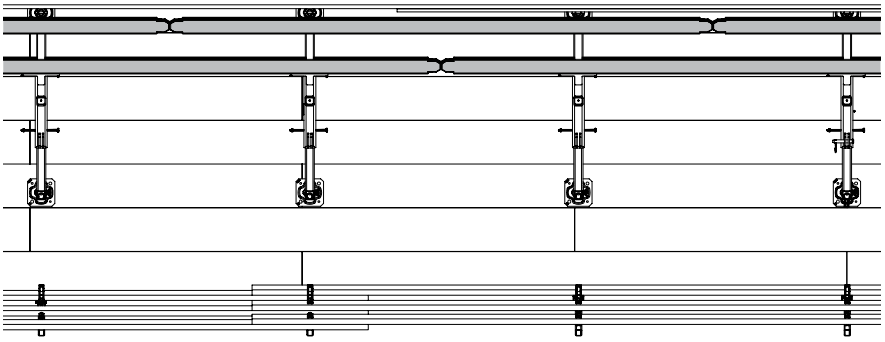


Fig. B4.01

Forward inclination of the Side Formwork

The forward inclination "v" is dependent on the height of the cantilevered parapet "H" and refers to the top edge of the cantilevered parapet. (Fig. B4.02)

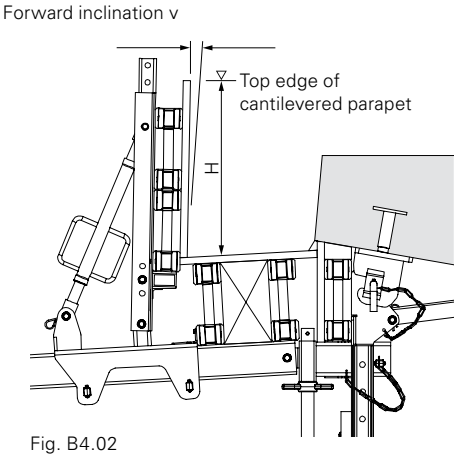


Fig. B4.02

Cantilevered parapet height H [cm]	Forward inclination v* [mm]
100	23
80	9
60	3
40	0

*Value with 1 m width of influence.
intermediate values to be interpolated linearly.

Table B4.01

C1 Concreting

Danger

Risk of overloading!
Cantilevered Parapet Brackets can fall to the ground.

⇒ Do not pour the concrete directly from the mixer vehicle or concrete bucket into the formwork construction.

⇒ Avoid any accumulation of concrete in the area of the Cantilevered Parapet Track.
(Fig. C1.01)

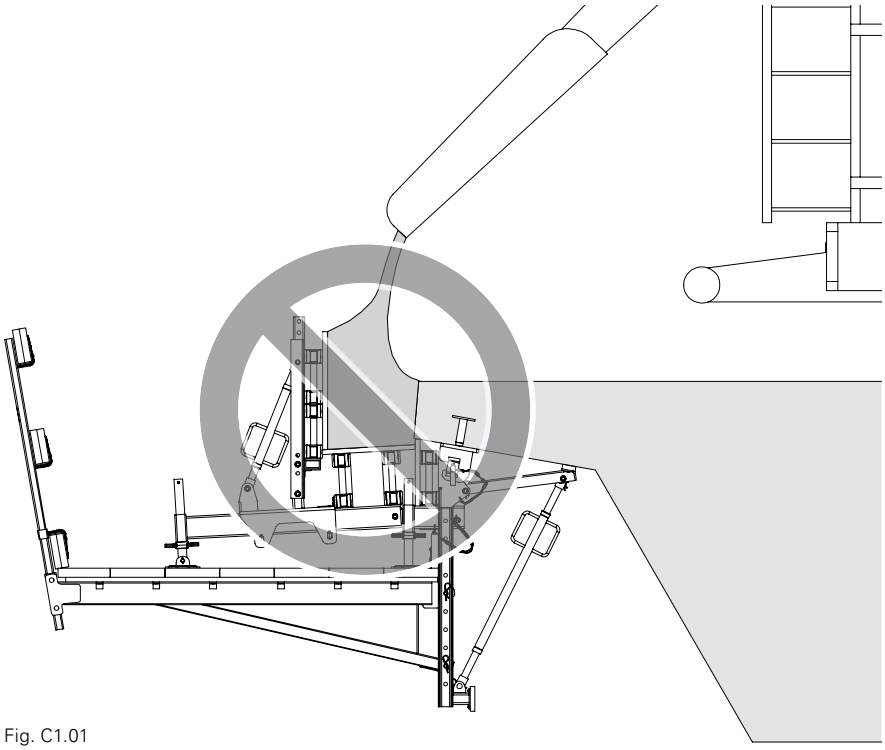


Fig. C1.01

Concreting

1. Pour concrete on the bridge cantilever.
2. Bring concrete into the formwork construction using a rake or something similar.
3. Compact concrete.
(Fig. C1.02)

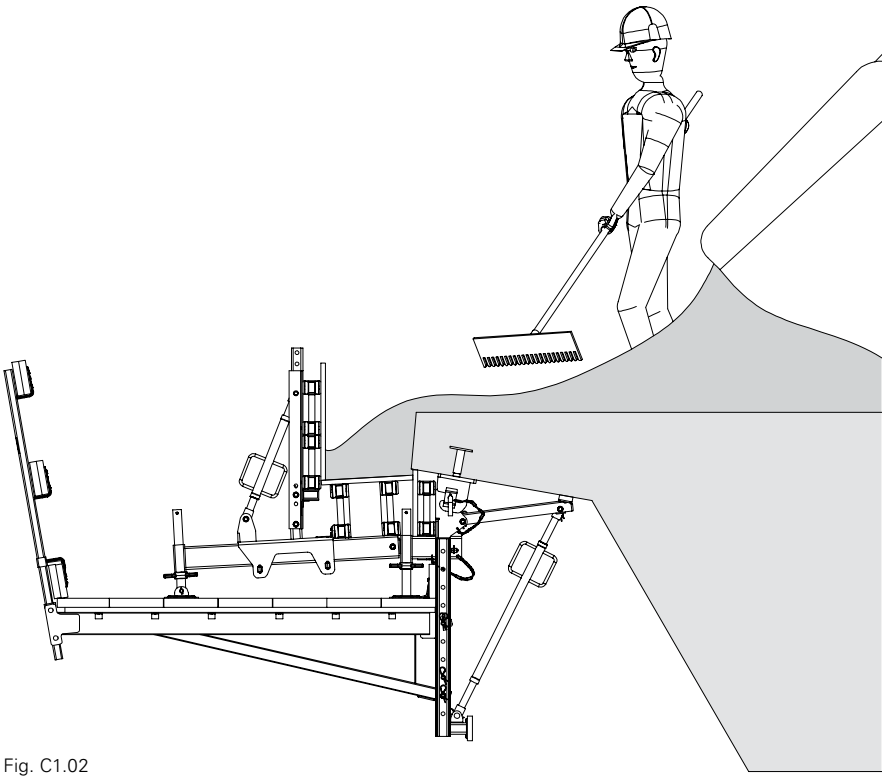


Fig. C1.02

Formwork unit

- Striking and dismantling of the Formwork Unit is carried out from the Platform Unit.
- Striking and dismantling is the same for all construction sizes using the reverse order of shuttering and assembly.

Side plate

1. Turn back Formwork Post VGK (7) with the Kicker AV 82 (2a) until side plate comes off the cantilevered parapet.
2. Remove the Side Formwork. (Fig. C2.01)

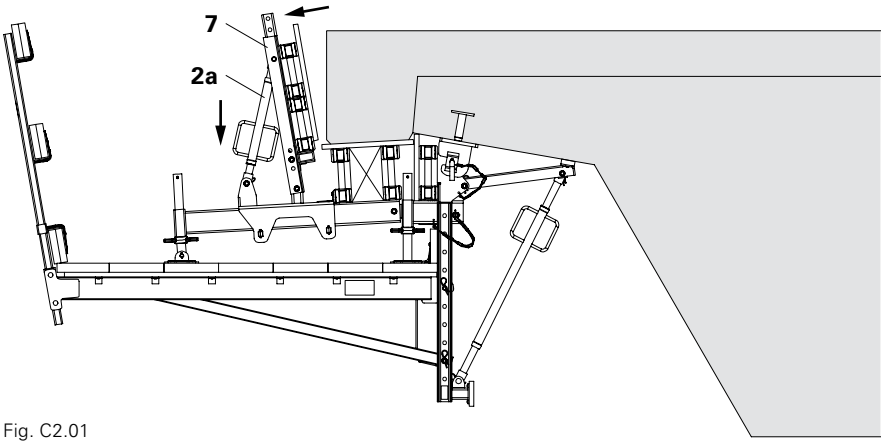


Fig. C2.01

Slab Formwork

1. Release wedge (5.1) on the Formwork Fixing VGK 2 (6.2) and wedges (6.2) on the Formwork Support VGK (6).
2. Turn spindle downwards until the Slab Formwork has been released from the cantilevered parapet. (Fig. C2.02)

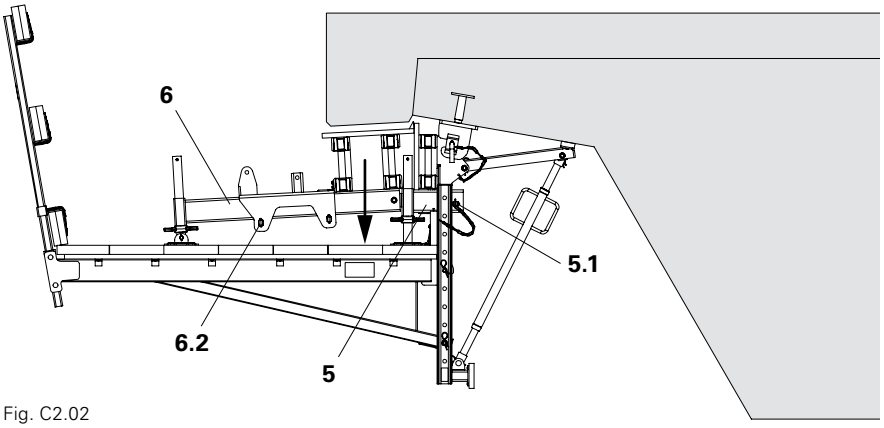


Fig. C2.02

Formwork Unit

1. Remove Formwork Post VGK 70 (7) and Kicker AV 82 (2a).
2. Remove the Slab Formwork.
3. Remove the Formwork Support VGK (6).
4. Remove the Formwork Fixing VGK 2 (5) and internal Stopend Formwork. (Fig. C3.01)

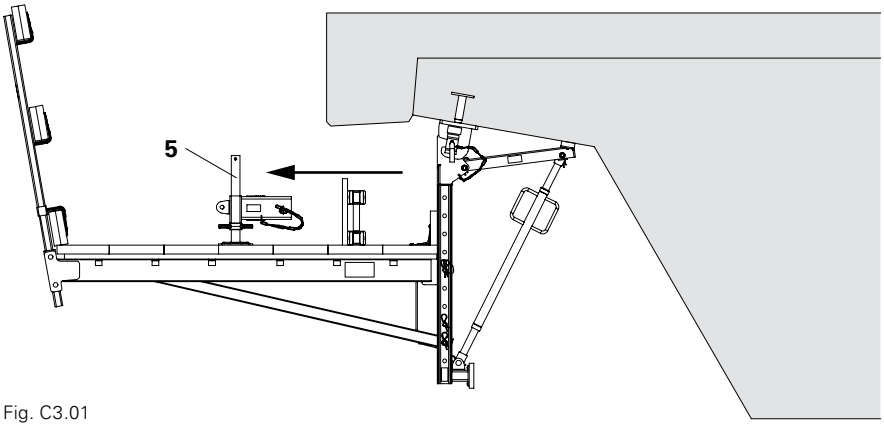


Fig. C3.01

On the cantilever

Danger

During assembly, leading edges are present!
There is a risk of falling off the cantilevered parapet.

⇒ Platform Unit and Bracket Unit are to be dismantled from a safe and secure working area, e.g.
- telescopic working platform.
- temporary working scaffold.
- personal protective equipment to prevent falling from a height (PPE)

Depending on the stage of construction, temporary safety measures to prevent falling may be required.

Platform Unit

1. Remove Guardrail Boards (33) and Guardrail Posts HSGP-2 (29).
2. Decking is continuously removed accordingly. (Fig. C3.02)
3. Remove the Platform Cantilever Beam VGK 170 (4).
4. Re-install bolts and cotter pins (1.3) in the Bracket Post VGK (1). (Fig. C3.03)

Bracket Unit

1. Remove locking pins Ø 20 x 260 (1.1) from the Suspension Head VGK (12) and remove Bracket Unit. (Fig. C3.04)
2. Place Bracket Unit on the ground and dismantle.
3. Remove bolt ISO M24 x 100-8.8 (16) and remove Suspension Head VGK (12).
4. Close anchor holes, e.g. with Cone FRC, see Section A5. (Fig. C3.05)

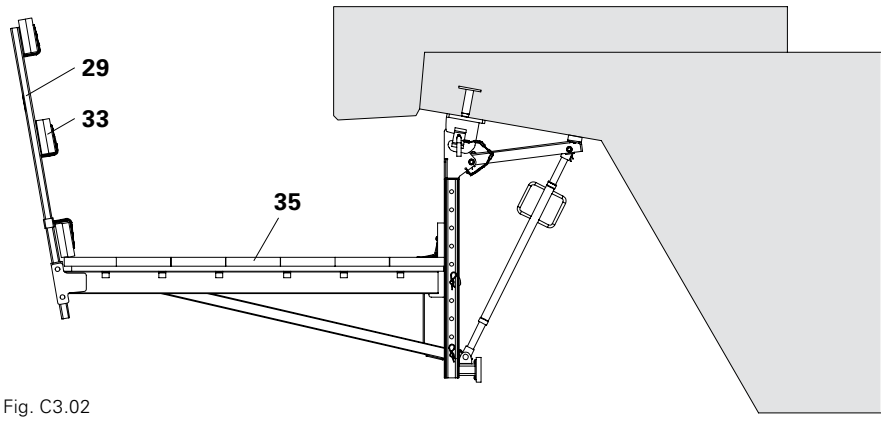


Fig. C3.02

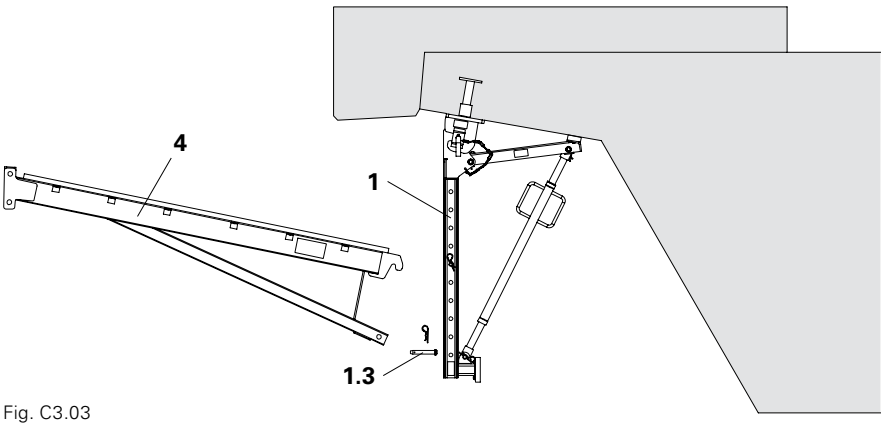


Fig. C3.03

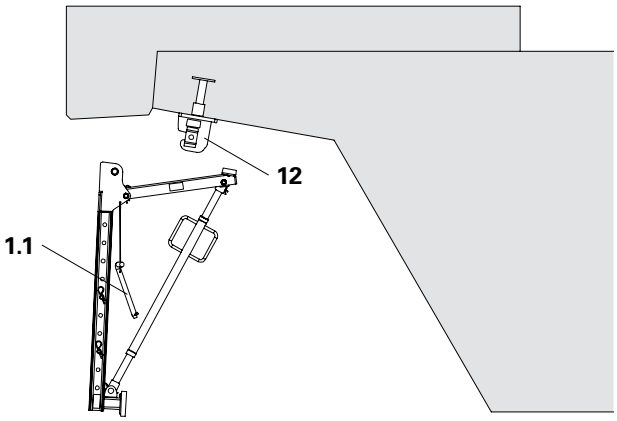


Fig. C3.04

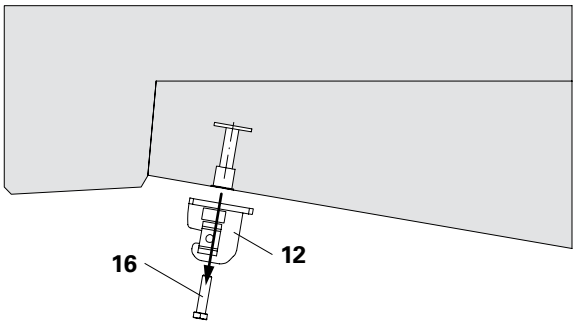


Fig. C3.05

On the abutment

Danger

During assembly, leading edges are present!
There is a risk of falling off the cantilevered parapet.

⇒ Platform Unit and Bracket Unit are to be dismantled from a safe and secure working area, e.g.
- telescopic working platform.
- temporary working scaffold.
- personal protective equipment to prevent falling from a height (PPE)

Dismantling the Cantilevered Parapet Bracket takes place in the same way as on the cantilever.

- Dismantle and remove the Formwork Unit. (Fig. C3.06)
- Dismantle and remove the Platform Unit. (Fig. C3.07)
- Dismantle and remove the Bracket Unit. (Fig. C3.08)
- Release bolt ISO 4014 M24 x 70-10.9 (23) and remove the Suspension Head VGK (12).
- Remove the anchors and close the anchor holes, e.g. with PERI Concrete Cones, see Section A5. (Fig. C3.09)

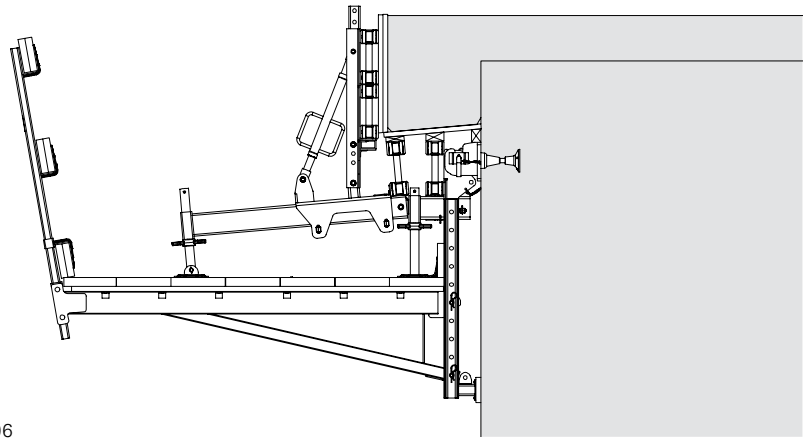


Fig. C3.06

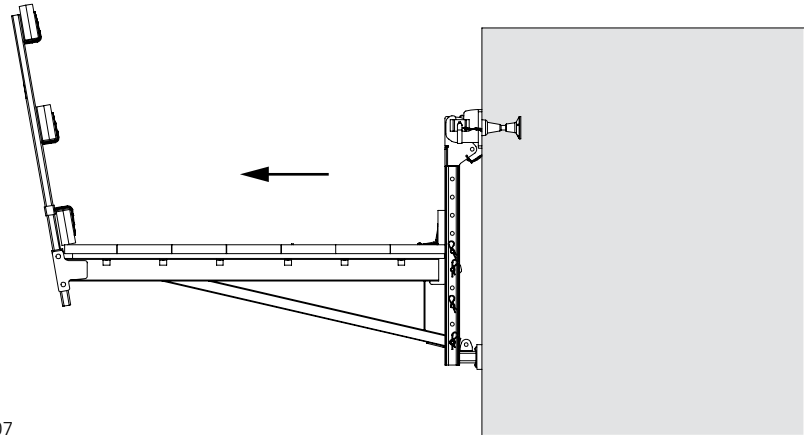


Fig. C3.07

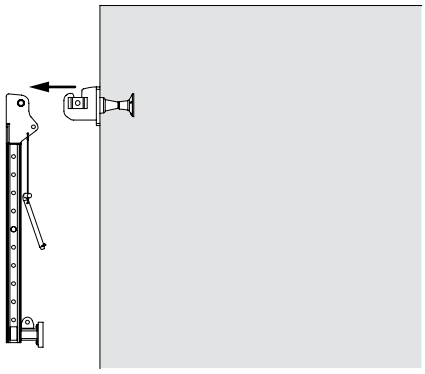


Fig. C3.08

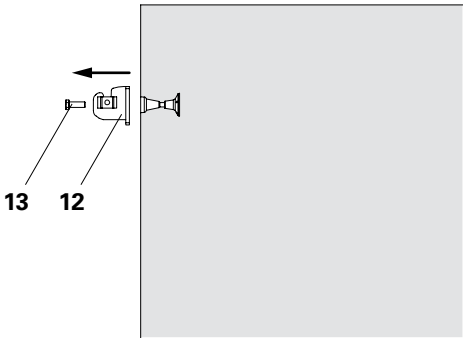


Fig. C3.09

Guardrail Post GKB

Danger
Unsecured concrete edges!
A fall can result in serious injury or even death.
Risk of falling.
⇒ Assembly and dismantling take place from a safe and secure working area, e.g. lifting platform, or
⇒ use PPE.

- All occurring loads must be safely transferred.
- Reinforcement stirrups must have sufficient load-bearing capacity.

For temporary fall protection on bridge edges, the Guardrail Post GKB is to be used in accordance with EN 13374. Side Guardrails are to be installed according to Table C4.01 or Table C4.02.

Two mounting variants are possible:

Version 1
The Guardrail Post GKB is clamped in the reinforcement stirrup.
(Fig. C4.01)

Required components

25	Guardrail Post GKB	1x
33	Guardrail boards	3x

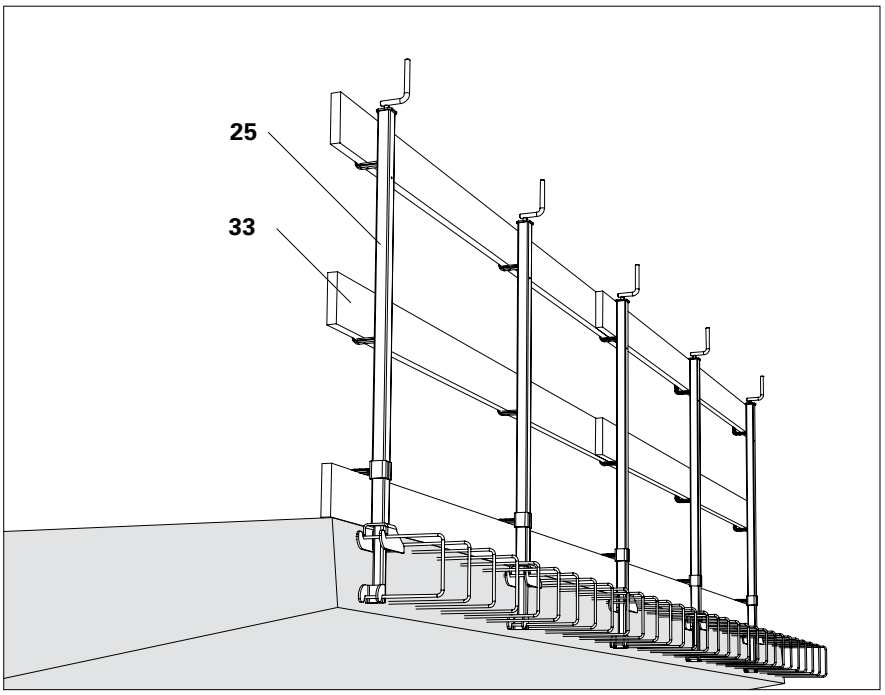


Fig. C4.01

Permissible width of influence for the Guardrail Posts

Guardrail Board h/w [cm]	perm. width of influence* [m]
12/4	1.60
15/3	1.55

* Values are valid only in compliance with the boundary conditions in Table C4.02 and Fig. C4.03

Table C4.01

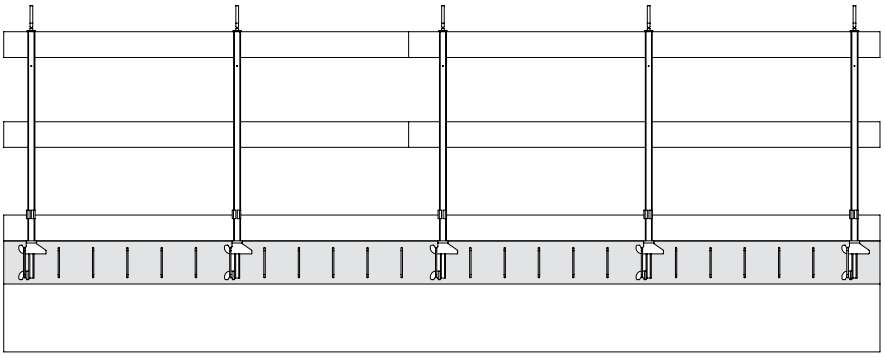


Fig. C4.01a

Assembly

1. Pre-adjust Guardrail Post GKB (**25**) with the crank.
2. Place the Guradrail Post GKB (**25**) in the reinforcement stirrup and tension with the crank.
3. Position Guardrail Boards (**33**) and secure, e.g. by means of wire pins or wood screws. (Fig. C4.02 + C4.03)

Dismantling

1. Turn crank until the lower holder is free and the guardrail post can be removed from the top reinforcement.

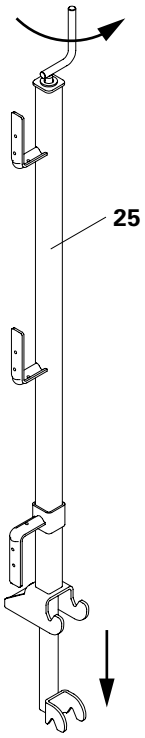


Fig. C4.02

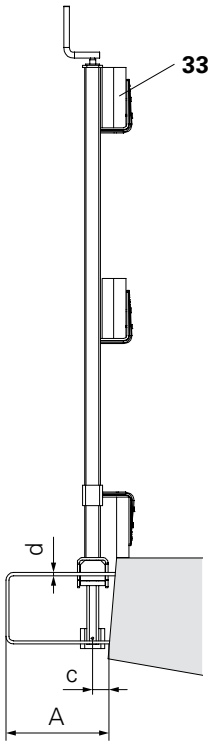


Fig. C4.03

Boundary conditions	
Tightening torque with the crank	≥60 Nm
Reinforcement stirrup spacing A	≥15 cm
Reinforcement stirrup diameter d	≥12 mm
Spacing of axis/Guardrail Post to front side of concrete c	≤6 cm

⇒ Table C4.02

Version 2
The Guardrail Post GKB is fixed to the parapet/bridge.
(Fig. C4.04c)

Required components

25	Guardrail Post GKB	1x
42	Screw-On Sleeve PERI M16/164	1x
43	Bolt ISO 4017 M16 x 120-8.8	1x
44	Washer ISO 7094 100 HV, A16	1x

- Installation of the PERI Screw-In Sleeve M16/164: see Data Sheet. (Fig. C4.06)
- Tighten and slightly tension the bolt M16 x 120 (43) together with washer ISO 7094 100 HV, A16 (44). (Fig. C4.04a + C4.04b + C4.05)

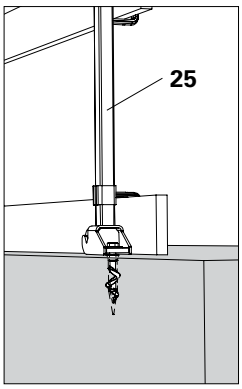


Fig. C4.04a

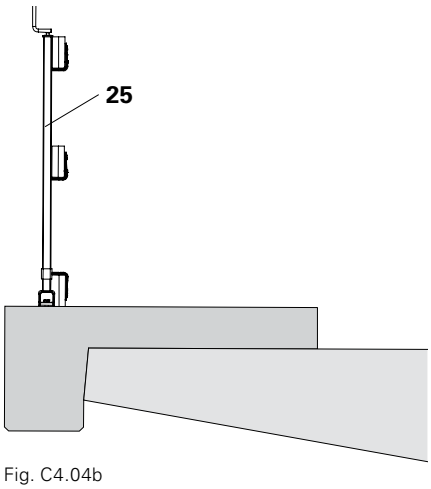


Fig. C4.04b

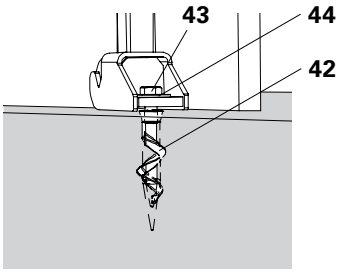


Fig. C4.04c

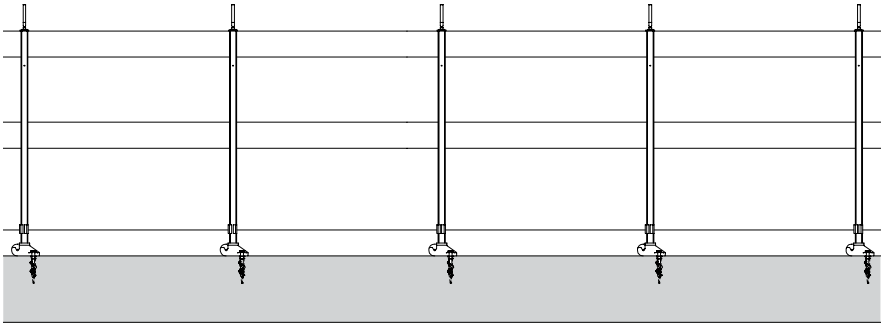


Fig. C4.05

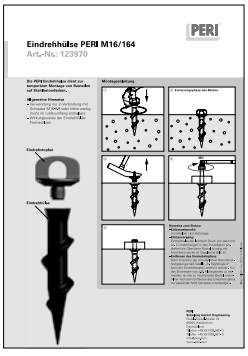
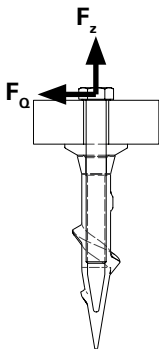


Fig. C4.06

Permissible width of influence for the Guardrail Posts when using the PERI Screw-In Sleeve

- The forces shown in the table can be linearly reduced or increased when using other anchoring methods with smaller or larger widths of influence.
- The permissible width of influence in Version 2 is limited:
  - Guardrail Board h/w = 12 cm / 4 cm: perm. width of influence = 1.50 m
  - Guardrail Board h/w = 15 cm / 3 cm: perm. width of influence = 1.20 m
- For Guardrail Boards which extend across only 2 bays, the permissible width of influence of the Guardrail Post is to be divided by 1.25.
- The safe transfer of existing forces into the building must be guaranteed.
- Take into account the manufacturer's information on the selected anchoring.



Guardrail Boards h/w [cm]	perm. width of influence* [m]	actual tensile force F_z on the anchoring [kN]	actual shear force F_Q on the anchoring [kN]
12/4	1.20	9.89	0.53
15/3	0.95	9.74	0.53

* Values are valid only in compliance with the boundary conditions in Table C4.04

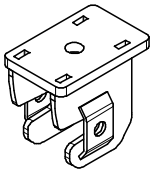
Table C4.03

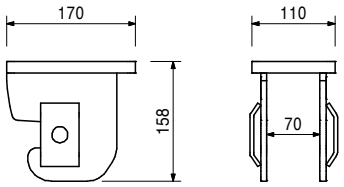
Boundary conditions	
Tightening torque with the crank	≥60 Nm
Reinforcement stirrup spacing A	≥15 cm
Reinforcement stirrup diameter d	≥12 mm
Spacing of axis/Guardrail Post to front side of concrete c	≤6 cm

Table C4.04

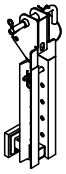
VGK Cantilevered Parapet Bracket

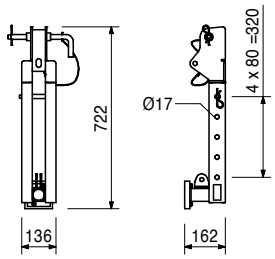
Item no.	Weight kg	
124413	4.390	**Suspension Head VGK** To attach the Bracket Post VGK 110/139 to the structure.



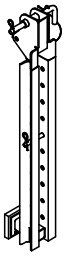


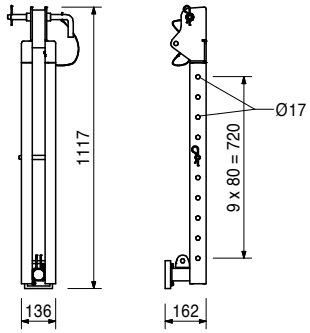
134161	11.900	**Bracket Post VGK 70** For connection of Platform Cantilever Beam VGK 170 and formwork with parapet height up to 60 cm and low clearance profile. **Complete with** 1 pc. 118463 Bolt Ø 16 x 90, galv. 1 pc. 113012 Pin Ø 20 x 260, galv. 2 pc. 018060 Cotter Pin 4/1, galv.





124404	17.300	**Bracket Post VGK 110** For connection of the Platform Cantilever Beam VGK 170 and formwork with parapet height up to 60 cm. **Complete with** 1 pc. 118463 Bolt Ø 16 x 90, galv. 1 pc. 113012 Pin Ø 20 x 260, galv. 2 pc. 018060 Cotter Pin 4/1, galv.



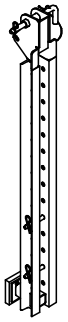


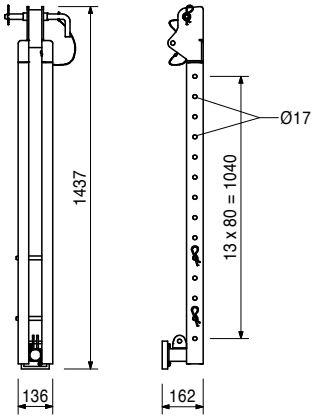
VGK Cantilevered Parapet Bracket

Item no.	Weight kg
124427	22.000

Bracket Post VGK 139
For connection of the Platform Cantilever Beam VGK 170 and formwork with parapet heights from 60 to 100 cm.

Complete with
2 pc. 118463 Bolt Ø 16 x 90, galv.
1 pc. 113012 Pin Ø 20 x 260, galv.
3 pc. 018060 Cotter Pin 4/1, galv.





Kickers AV

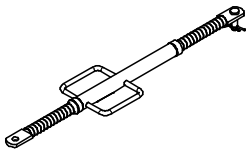
min. L	max. L
500	820
790	1110

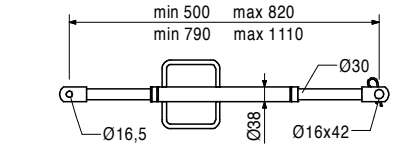
Item no.	Weight kg	
057087	3.510	**Kicker AV 82**
057088	4.200	**Kicker AV 111**

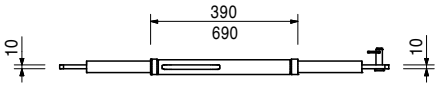
For aligning PERI Formwork Systems.

Complete with
1 pc. 027170 Pin Ø 16 x 42, galv.
1 pc. 018060 Cotter Pin 4/1, galv.

Note
Permissible load see PERI Design Tables.





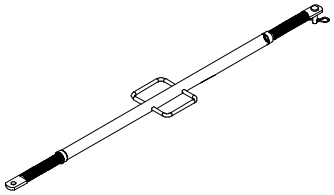


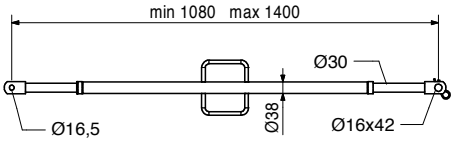
Item no.	Weight kg	
028110	4.850	**Kicker AV 140**

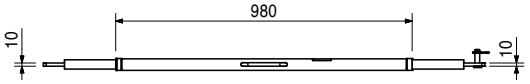
Extension length l = 1.08 – 1.40 m.
For aligning PERI Formwork Systems.

Complete with
1 pc. 027170 Pin Ø 16 x 42, galv.
1 pc. 018060 Cotter Pin 4/1, galv.

Note
Permissible load see PERI Design Tables.

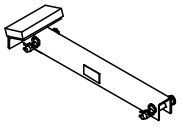


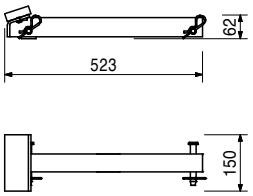




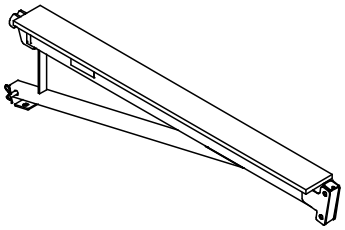
VGK Cantilevered Parapet Bracket

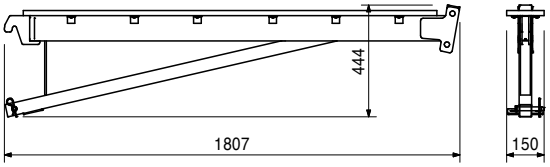
Item no.	Weight kg		
124455	3.050	**Bracket Cantilever VGK 50** For assembly of the bracket unit with Bracket Post VGK 70/110/139 and Kicker AV 82/111/140.	**Complete with** 2 pc. 118463 Bolt Ø 16 x 90, galv. 2 pc. 018060 Cotter Pin 4/1, galv.



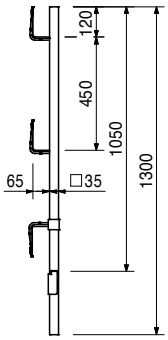


124447	21.100	**Platform Cantilever Beam VGK 170** For connection to the Bracket Post VGK 70/110/139 and installation of a fully closed platform planking.	**Complete with** 1 pc. 118463 Bolt Ø 16 x 90, galv. 1 pc. 018060 Cotter Pin 4/1, galv.



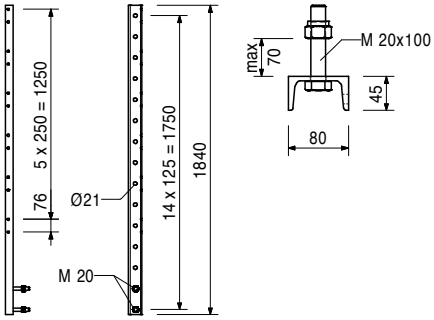


116292	4.720	**Guardrail Post HSGP-2** As guardrail for different systems.	



VGK Cantilevered Parapet Bracket

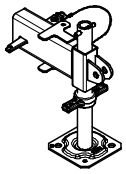
Item no.	Weight kg	
114328	16.600	**Guardrail Post RCS/SRU 184** For assembly of the guardrail on the Platform Beam RCS/SRU or Angle Connector RCS/SRU. **Complete with** 2 pc. 114727 Bolt ISO 4017 M20 x 100-8.8, galv. 2 pc. 781053 Nut ISO 7040 M20-8, galv.

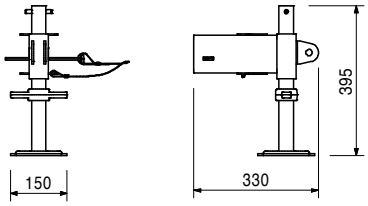


Accessories

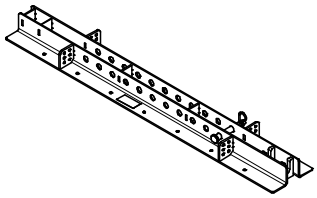
110296	0.220	**Clamp A64 DIN 3570 M12, galv.**
710330	0.017	**Nut ISO 4032 M12-8, galv.**

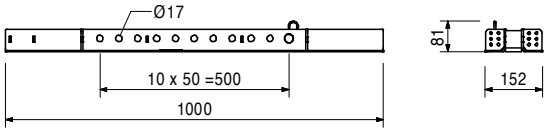
124394	6.640	**Formwork Fixing VGK 2** For connection of the Formwork Support VGK 100 to the Bracket Post VGK 110/139.



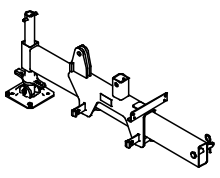


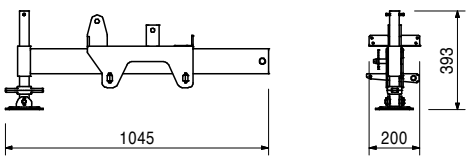
134169	7.650	**Formwork Support VGK 60** For connection of bottom and lateral formwork in combination with Bracket Post VGK 70. **Complete with** 1 pc. 118463 Bolt Ø 16 x 90, galv. 1 pc. 018060 Cotter Pin 4/1, galv.





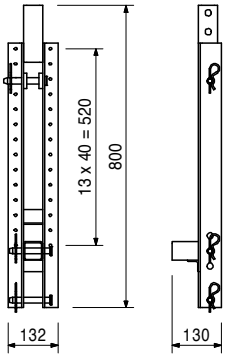
124438	20.100	**Formwork Support VGK 100** For connection of the bottom and lateral formwork. **Complete with** 1 pc. 118463 Bolt Ø 16 x 90, galv. 1 pc. 018060 Cotter Pin 4/1, galv.



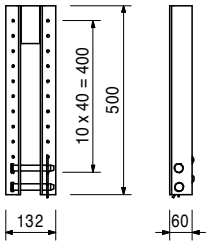


VGK Cantilevered Parapet Bracket

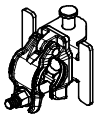
Item no.	Weight kg		
124371	7.300	**Formwork Post VGK 70** For mounting of the lateral formwork.	**Complete with** 3 pc. 118463 Bolt Ø 16 x 90, galv. 3 pc. 018060 Cotter Pin 4/1, galv.

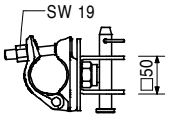


124360	4.500	**Formwork Post Extension VGK 40** For extension of the Formwork Post VGK 70 with parapet height from 60 to 100 cm.	**Complete with** 2 pc. 118463 Bolt Ø 16 x 90, galv. 2 pc. 018060 Cotter Pin 4/1, galv.

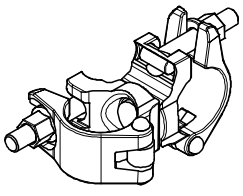


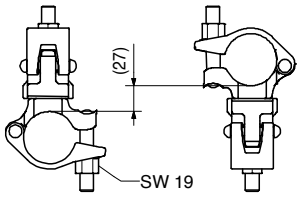
124934	1.750	**Brace Connector VGK** For bracing due to longitudinal inclination.	**Complete with** 1 pc. 710222 Bolt ISO 4014 M16 x 80-8.8, galv. 1 pc. 710229 Nut ISO 4032 M16-8, galv.





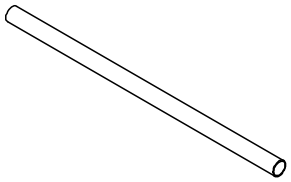
102400	1.100	**Swivel Coupling SW 38/48, galv.** For Scaffold Tubes Ø 48 mm and Ø 38 mm.	

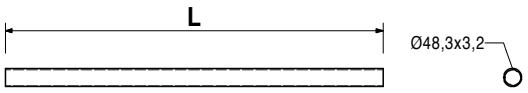




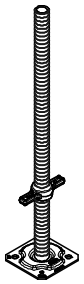
VGK Cantilevered Parapet Bracket

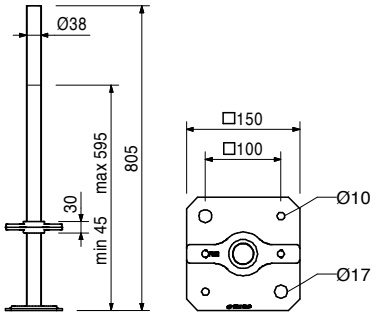
Item no.	Weight kg		
		Scaffold Tubes Stell Ø 48.3	**L**
026415	3.550	**Scaff. Tube Steel Ø 48.3 x 3.2, special length**	
026417	0.000	**Cutting Cost Scaffold Tube**	
026411	3.550	**Scaff. Tube Steel Ø 48.3 x 3.2, l = 1.0 m**	1000
026412	7.100	**Scaff. Tube Steel Ø 48.3 x 3.2, l = 2.0 m**	2000
026413	10.650	**Scaff. Tube Steel Ø 48.3 x 3.2, l = 3.0 m**	3000
026414	14.200	**Scaff. Tube Steel Ø 48.3 x 3.2, l = 4.0 m**	4000
026419	17.750	**Scaff. Tube Steel Ø 48.3 x 3.2, l = 5.0 m**	5000
026418	21.600	**Scaff. Tube Steel Ø 48.3 x 3.2, l = 6.0 m**	6000



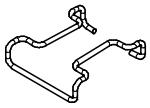


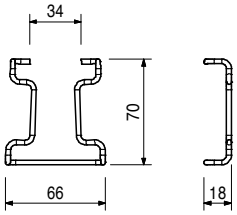
100242	4.570	**Adj. Base Plate UJB 38-80/55**	**Note** With captive yellow Quick Jack Nut.





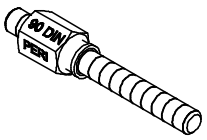
134174	0.019	**B15 Anchor Lock VGK**

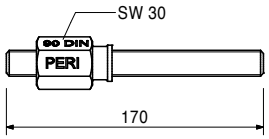




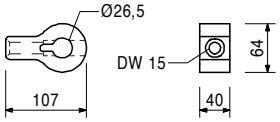
VGK Cantilevered Parapet Bracket

Item no.	Weight kg	
134173	0.495	**B15 Anchor VGK** To attach VGK Cantilevered Parapet Bracket to the Anchor System in accordance with General Building Approval No. Z-21.6-1764 with installation length hnom = 125 mm.





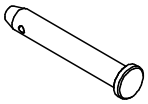
115378	1.080	**Eye Nut RCS DW 15** As an articulated connection to the Climbing Rail RCS, Steel Waler SRU for bracing with DW 15.

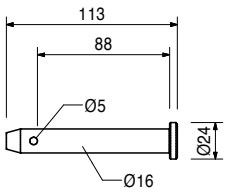


Accessories

104031	0.462	**Fitting Pin Ø 21 x 120**
018060	0.014	**Cotter Pin 4/1, galv.**
111567	0.729	**Fitting Pin Ø 26 x 120**
022230	0.033	**Cotter Pin 5/1, galv.**

118463	0.181	**Bolt Ø 16 x 90, galv.**



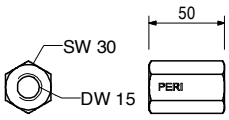


018060	0.014	**Cotter Pin 4/1, galv.**

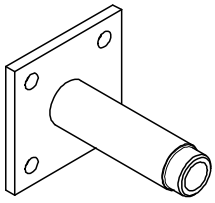
VGK Cantilevered Parapet Bracket

Item no.	Weight kg	
030070	0.222	**Hex. Nut DW 15 SW 30/50, galv.** For anchoring with Tie Rod DW 15 and B 15.

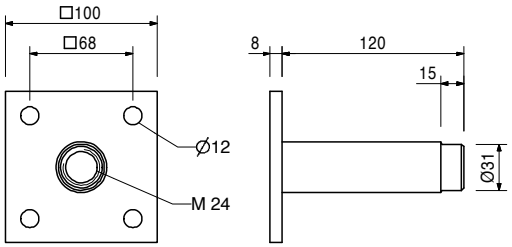
Technical Data
Permissible load 90 kN.



026230	1.010	**Anchor Sleeve M24** To anchor platform systems.



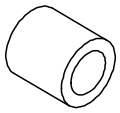
Note
Separate design information on request.

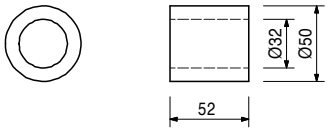


Accessories

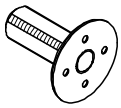
026240	0.026	**Cone PP Ø 31/26, c = 25**
026250	0.005	**Plug Ø 26 mm**
116233	0.116	**Cone FRC Ø 32/52, c = 40**
026420	0.123	**Anchor Positioning Stud M24, galv.**
116234	0.033	**Plug FRC Ø = 32**
115150	0.200	**Anchor Positioning Stud M24 x 65, galv.**
123800	0.045	**Metric Threaded Cone M24**

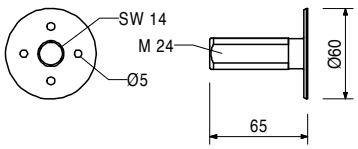
116233	0.116	**Cone FRC Ø 32/52, c = 40** Ensures a concrete cover of 40 mm in conjunction with Anchor Sleeve M24. Made of fibre reinforced concrete.



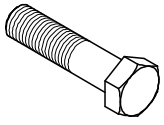


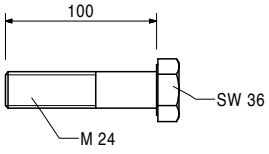
115150	0.200	**Anchor Positioning Stud M24 x 65, galv.** For fixing the Anchor Sleeve M24 if fixation through formlining is not possible.





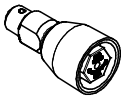
124031	0.452	**Hex Bolt ISO 4014-M24 x 100-8.8, galv.**

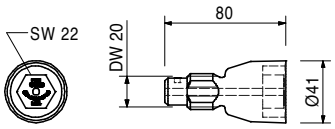




VGK Cantilevered Parapet Bracket

Item no.	Weight kg	
123800	0.045	**Metric Threaded Cone M24** For pre-fixing of Anchor Sleeve M24 with a concrete cover of 40 mm in bridge cantilevers

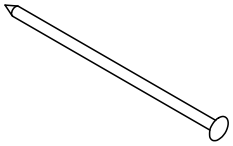


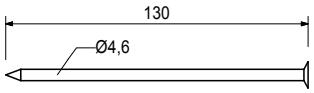


Accessories

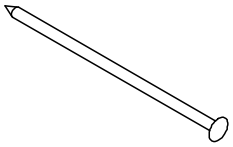
026230	1.010	**Anchor Sleeve M24**
123820	0.063	**Plug FRC Ø = 40**
129157	0.017	**Nail 4.6 x 130**

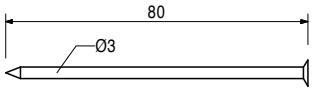
129157	0.017	**Nail 4.6 x 130**



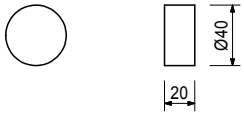


710312	0.005	**Nail 3 x 80**





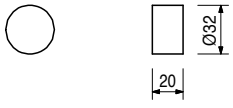
123820	0.063	**Plug FRC Ø = 40** For closing the tie hole when using Threaded Cone M24.



Accessories

031550	1.000	**Repoxal Glue**

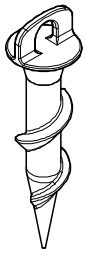
116234	0.033	**Plug FRC Ø = 32** For closing the Cone FRC Ø 32. Made of fibre reinforced concrete.

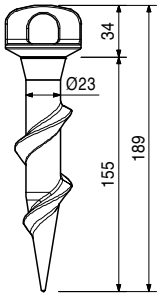


Accessories

031550	1.000	**Repoxal Glue**

Item no.	Weight kg		
031550	1.000	**Repoxal Glue** Two-component adhesive for bonding fibre reinforced concrete plugs. Requirements: 1 kg adhesive for approx. 200 Plugs FZR 32 or 330 Plugs FZR 22.	**Note** See Safety Data sheet! Delivery unit 1.0 kg
123970	0.047	**Screw-On Sleeve PERI M16/164** For temporary mounting of components on reinforced concrete slabs.	**Note** Inserted into the fresh concrete immediately after concreting.

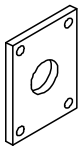


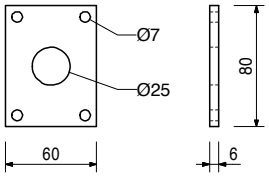


Accessories

123973	0.240	**Bolt ISO 4014 M16 x 130-8.8, galv.**

029280	0.196	**Anchor Positioning Plate M24, galv.** For fixing the M24 anchor system if the plywood formlining is drilled through.

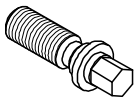


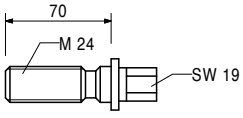


Accessories

029440	0.005	**Lag Screw DIN 571 6 x 20, galv.**

029270	0.331	**Advancing Bolt M24, galv.** For fixing the M24 Anchor System if the plywood formlining is drilled through.



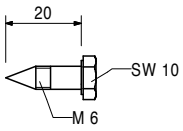


Accessories

029280	0.196	**Anchor Positioning Plate M24, galv.**

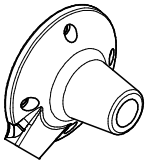
VGK Cantilevered Parapet Bracket

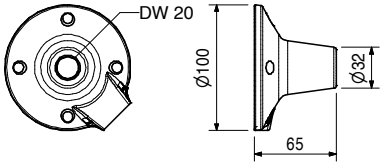
Item no.	Weight kg	
029440	0.005	**Lag Screw DIN 571 6 x 20, galv.**



030860	0.792	**Threaded Anchor Plate DW 20** For use with Tie Rod DW 20, B 20 or Screw-On Cone-2 M24/DW 20. For anchoring in concrete.

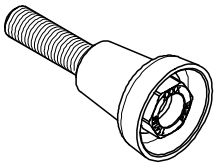
Note
Lost anchor part.

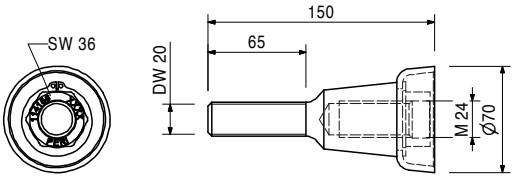




114158	1.030	**Screw-On Cone-2 M24/DW 20, galv.** Anchor System M24. For anchoring climbing systems.

Note
Separate design information on request.



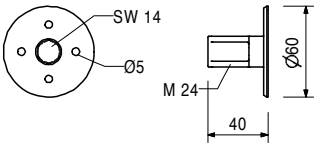


Accessories

030860	0.792	**Threaded Anchor Plate DW 20**

026420	0.123	**Anchor Positioning Stud M24, galv.** For fixing the M24 anchor system if the plywood formlining is not drilled through.

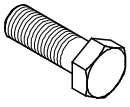
Note
Allen Key SW 14.

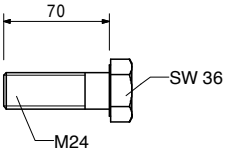


Accessories

027212	0.445	**Allen Key SW 14, long**
710312	0.005	**Nail 3 x 80**

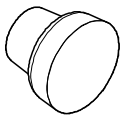
026430	0.334	**Bolt ISO 4014 M24 x 70-10.9, glav.** High-strength bolt for anchoring climbing systems.

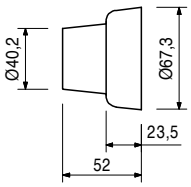




VGK Cantilevered Parapet Bracket

Item no.	Weight kg		
031652	0.247	**KK Concrete Cone M24-67/52** For closing anchor points with Climbing Cone-2, M24/DW 15 and Screw-On Cone-2 M24/DW 20.	**Note** Delivery unit 50 pieces.

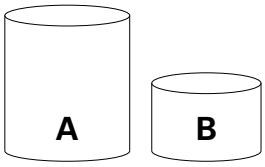




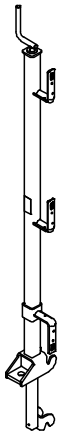
Accessories

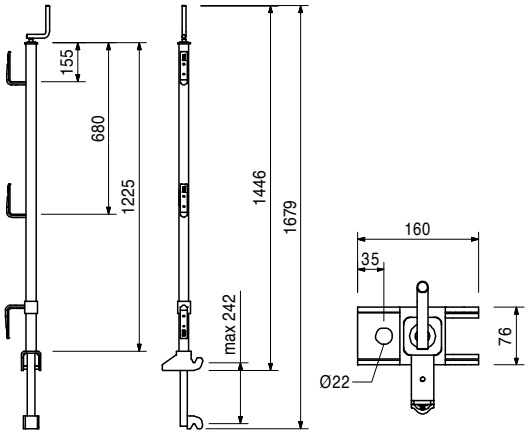
131709	9.980	**Sealing Compound-3, 6-can set**

131709	9.980	**Sealing Compound-3, 6-can set** For bonding PERI Concrete Cones.	**Note** See Safety Data sheet! Consisting of: 6 x Component A, 6 x Component B



114299	9.520	**Guardrail Post GKB** For fixing to the reinforcement or to the embedded anchors.

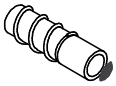


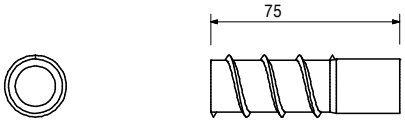


VGK Cantilevered Parapet Bracket

Item no.	Weight kg		
130012	0.337	**Anchor Bolt M16 - M24 x 50** Refurbishment anchor for subsequent attachment of Suspension Head VGK to existing bridge structures.	**Note** Separate design information on request.

129637	0.195	**Chemical Anchor Sleeve IM 16 x 100** Internal threaded Sleeve for connection bolt M16/ M24 x 50.	**Note** Separate design information on request.





129628	0.555	**Composite Mortar CF-T 300 V**

Accessories

130013	0.010	**Mixer CF-T 300 V**

130013	0.010	**Mixer CF-T 300 V**

130014	1.160	**Dispenser CF-T 300 V**

VGK Cantilevered Parapet Bracket

Item no.	Weight kg	
130015	0.277	**Blow Out Pump**

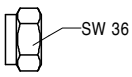
130011	0.084	**Cleaning Brush D24**

Accessories

130623	0.016	**T-Handle M6**

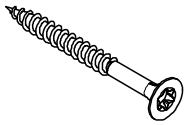
130623	0.016	**T-Handle M6**

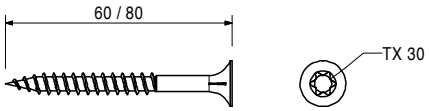
105032	0.070	**Nut ISO 7040 M24-8, galv.** Self-locking.



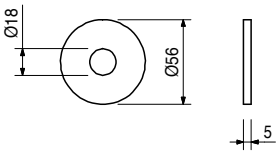
		TSS-Torxs 6, galv.
024470	0.008	**TSS-Torx 6 x 60, galv.**
024690	0.008	**TSS-Torx 6 x 80, galv.**

For Torx Blade TX 30. Self-drilling.





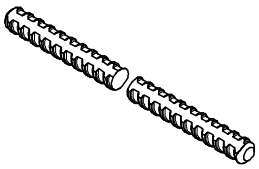
113349	0.087	**Washer ISO 7094 100 HV, A 16, galv.**



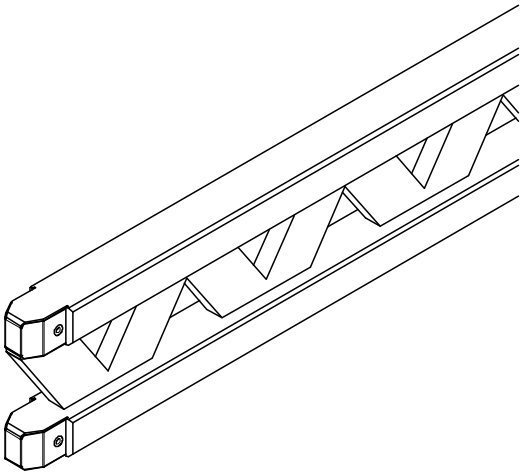
VGK Cantilevered Parapet Bracket

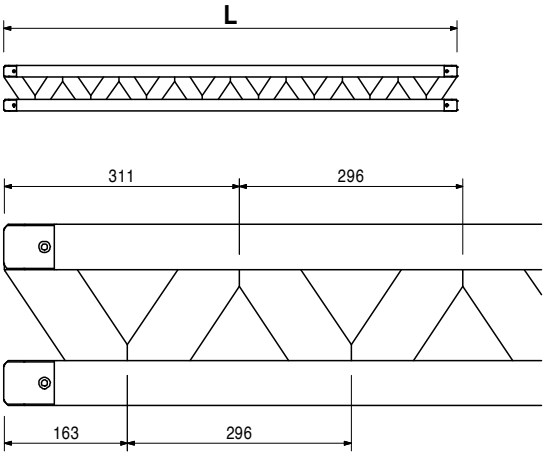
Item no.	Weight kg		
		Tie Rods DW 15	
030030	1.440	**Tie Rod DW 15, spec. length**	
030050	0.000	**Cutting Cost Tie Rod DW 15, B 15**	

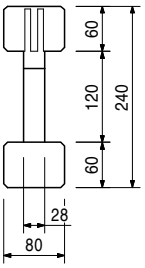
Note
Non-weldable! Take official approval into consideration!
Technical Data
Permissible tension force 90 kN.



		Girders GT 24	**L**
075100	5.300	**Girder GT 24, l = 0.90 m**	918
075120	7.100	**Girder GT 24, l = 1.20 m**	1214
075150	8.900	**Girder GT 24, l = 1.50 m**	1510
075180	10.600	**Girder GT 24, l = 1.80 m**	1806
075210	12.400	**Girder GT 24, l = 2.10 m**	2102
075240	14.200	**Girder GT 24, l = 2.40 m**	2398
075270	15.900	**Girder GT 24, l = 2.70 m**	2694
075300	17.700	**Girder GT 24, l = 3.00 m**	2990
075330	19.500	**Girder GT 24, l = 3.30 m**	3286
075360	21.200	**Girder GT 24, l = 3.60 m**	3582
075390	23.000	**Girder GT 24, l = 3.90 m**	3878
075420	24.800	**Girder GT 24, l = 4.20 m**	4174
075450	26.600	**Girder GT 24, l = 4.50 m**	4470
075480	28.300	**Girder GT 24, l = 4.80 m**	4766
075510	30.100	**Girder GT 24, l = 5.10 m**	5062
075540	31.900	**Girder GT 24, l = 5.40 m**	5358
075570	33.600	**Girder GT 24, l = 5.70 m**	5654
075600	35.400	**Girder GT 24, l = 6.00 m**	5950







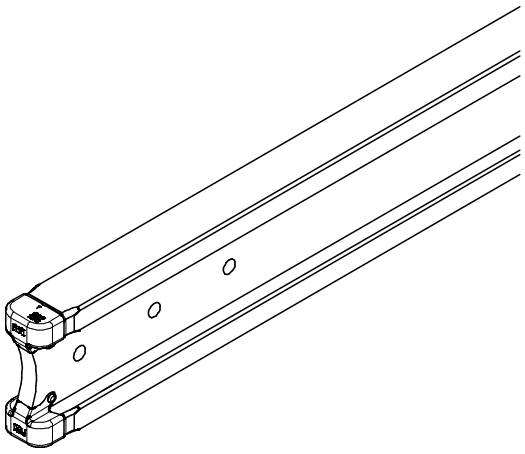
VGK Cantilevered Parapet Bracket

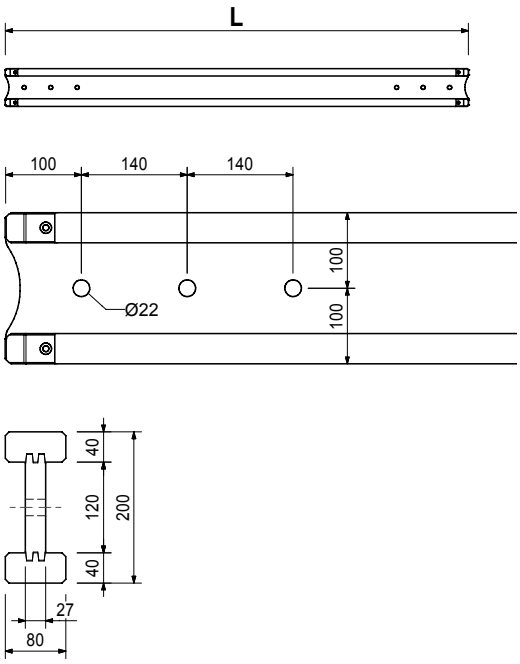
Item no.	Weight kg	
		Girders VT 20K
074990	8.230	**Girder VT 20K, l = 1.45 m**
074905	12.010	**Girder VT 20K, l = 2.15 m**
074910	13.630	**Girder VT 20K, l = 2.45 m**
074890	14.710	**Girder VT 20K, l = 2.65 m**
074920	16.060	**Girder VT 20K, l = 2.90 m**
074930	18.220	**Girder VT 20K, l = 3.30 m**
074940	19.840	**Girder VT 20K, l = 3.60 m**
074950	21.460	**Girder VT 20K, l = 3.90 m**
074960	24.700	**Girder VT 20K, l = 4.50 m**
074970	26.860	**Girder VT 20K, l = 4.90 m**
074980	32.260	**Girder VT 20K, l = 5.90 m**

Universal formwork girder made of wood.

Note

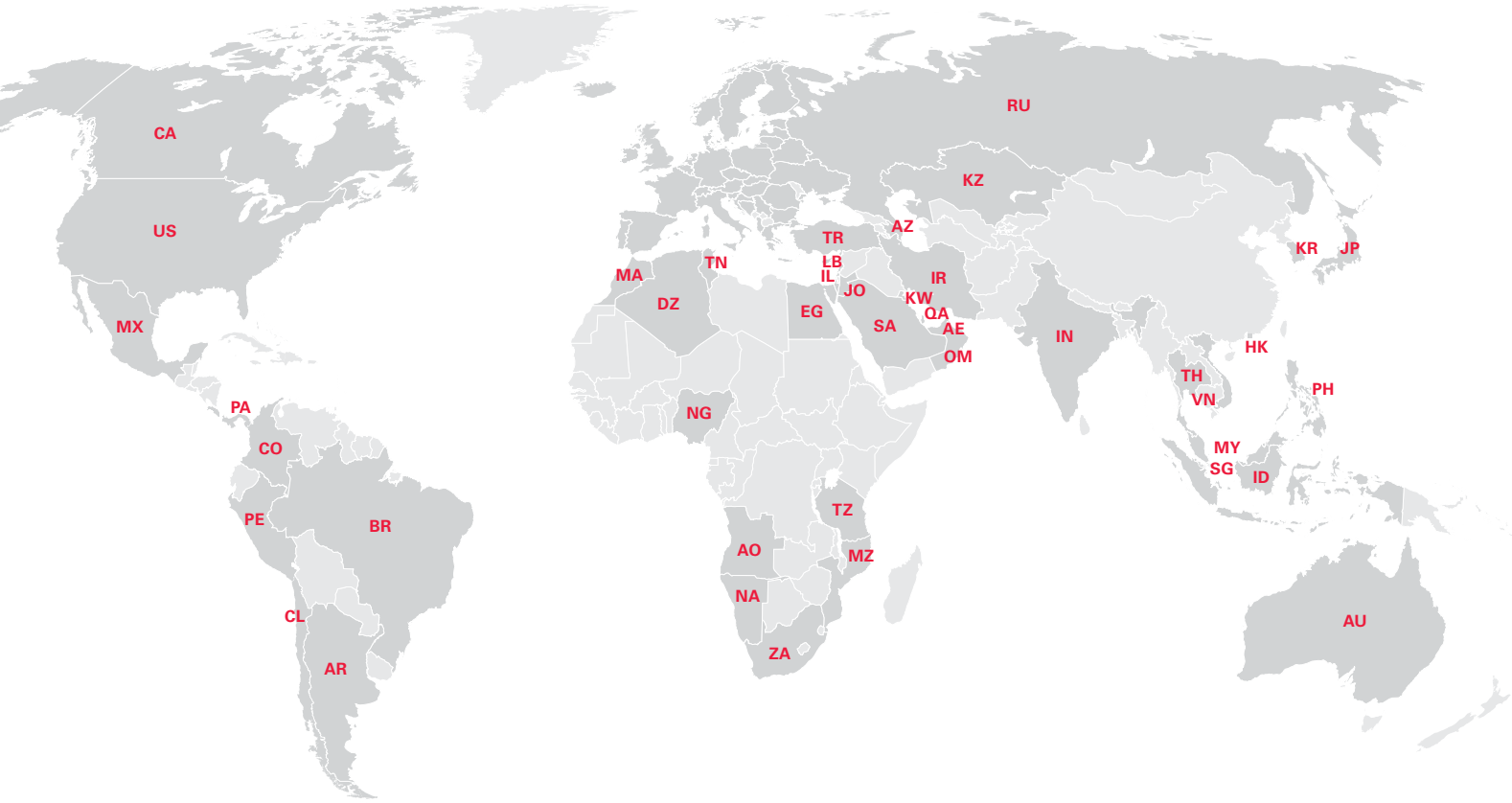
The girder fulfils all requirements of DIN EN 13377 class P20 (Declaration of Conformity).





074900	0.000	**Cutting Cost VT Girder**

PERI International



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