PHILIPPGROUP

PHILIPP Compact anchor

VB3-V-005-en - 07/20 - PDF

Installation Instruction

Transport and mounting systems for prefabricated building

Technical department

Our staff will be pleased to support your planning phase with suggestions for the installation and use of our transport and mounting systems for precast concrete construction.

Special designs

Customized to your particular needs.

Practical tests on site

We ensure that our concepts are tailored precisely to your requirements.

Inspection reports

For documentation purposes and your safety.

On-site service

Our engineers will be pleased to instruct your technicians and production personnel at your plant, to advise on the installation of precast concrete parts and to assist you in the optimisation of your production processes.

High safety level when using our products

Close cooperation with federal materials testing institutes (MTIs), and official approvals for the use of our products and solutions whenever necessary.

Software solutions

The latest design software, animated videos and CAD libraries can always be found under www.philipp-gruppe.de.

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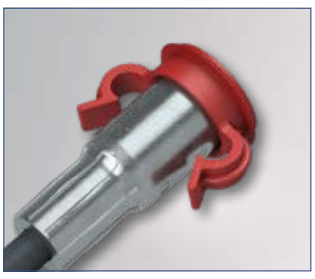
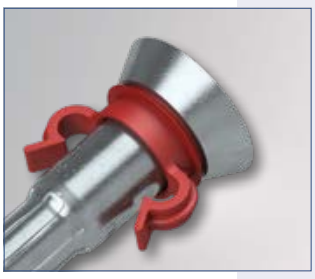
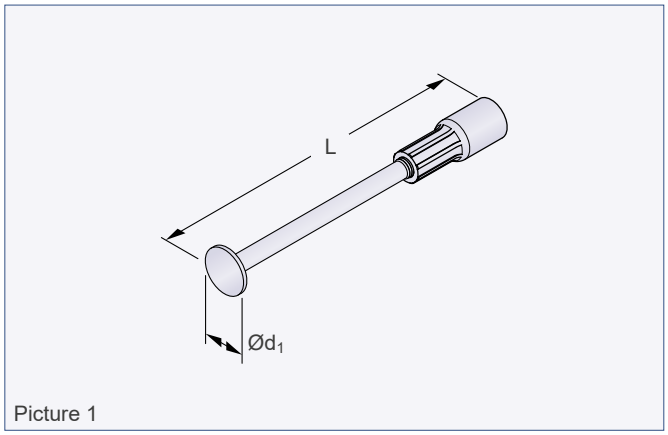
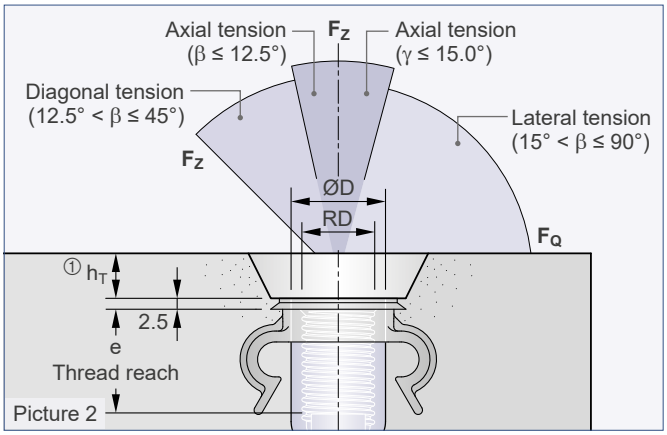
Content


PHILIPP Compact anchor



Picture 1



Picture 2

The Compact anchor is used for the installations on the face side of beam-like elements and stairs. It is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS Guideline "Lifting inserts and lifting insert systems for precast concrete elements" (VDI/BV-BS 6205).
The use of Compact anchors requires the compliance with this Installation Instruction as well as the General Installation Instruction. The Installation and Application Instructions for the belonging PHILIPP lifting devices (Lifting loop with threaded end, Lifting loop Plus, “Wirbelstar”, “Lifty”) as well as the Application Instruction of the belonging PHILIPP accessories (KHN system, WS system etc.) must be followed also.

The anchor may only be used in combination with the mentioned PHILIPP lifting devices. Compact anchors are designed for the transport of precast concrete units only. Multiple use within the transport chain (from production to installation of the unit) means no repeated usage. The Threaded transport anchor is not specified for a repeated usage (e.g. ballasts for cranes) or a permanent fixation.

The EC Declaration of Conformity (DoC) of the Compact anchor is available on request or can be downloaded from our website www.philipp-group.de.

Table 1: Dimensions

Ref.-no. ② **galvanised**	Type	RD	Dimensions ØD [mm]	L [mm]	e [mm]	Ød1 [mm]	Weight [kg/100 pcs.]
67K120100	RD 12	12	15.0	100	22	20	6.0
67K120150				150			10.0
Der Typ RD 14 des Gewindetransportankersystems ist nicht mehr verfügbar							
67K160130	RD 16	16	21.0	130	27	25	14.0
67K160175				175			17.0
Der Typ RD 18 des Gewindetransportankersystems ist nicht mehr verfügbar							
67K200185	RD 20	20	27.0	185	35	35	34.0
67K200250				250			43.0
67K240200	RD 24	24	31.0	200	43	35	42.0
67K240275				275			52.0
67K300275	RD 30	30	39.5	275	56	50	105.0
67K300350				350			126.0
67K360334	RD 36	36	47.0	334	68	60	184.0
67K360450				450			227.0
67K420385	RD 42	42	54.0	385	75	70	273.0
67K420500				500			323.0
67K520550	RD 52	52	67.0	550	100	85	567.0
67K520700				700			634.0

① Mind the embedding depth h_T of the corresponding recess former (Picture 2).
② Also available in version stainless steel (Ref.-no. 75K_____VA).

General notes / selection of anchor

Materials

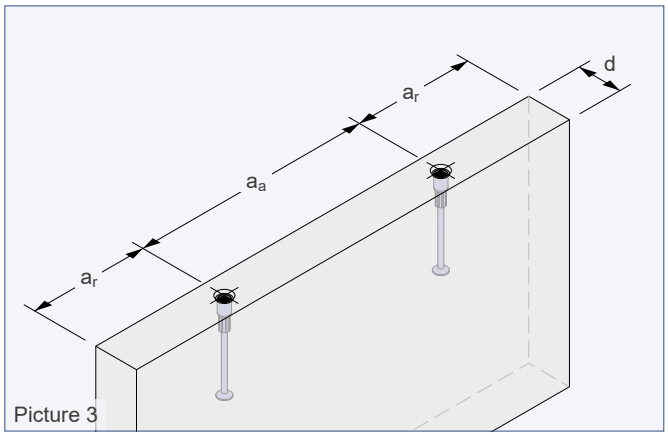
The Compact anchor consists of a round steel with foot and a crimped-on insert. The threaded inserts are made of special high precision steel tubes and are galvanised according to common standards.
This galvanisation protects the anchor temporarily from the storage at the producer site to the final installation in the concrete element.

Corrosion

In order to avoid contamination or damage to the concrete surface of the precast concrete element due to corrosion of the transport anchor (stream of rust or similar), the insert can be delivered in stainless steel alternatively. Here the surface of the foot is protected by a special sealing against corrosion.

Element thicknesses, centre and edge distances

The installation and position of threaded transport anchors in precast concrete elements require minimum element dimensions and centre/edge distances for a safe load transfer.



Picture 3

Concrete strength

At the time of the first lift of the concrete unit the concrete strength must have a minimum f_{cc} according to the tables of the respective load case. Given concrete strengths f_{cc} are cube compressive strengths at the time of the first lifting.

Selection guide for transport anchors

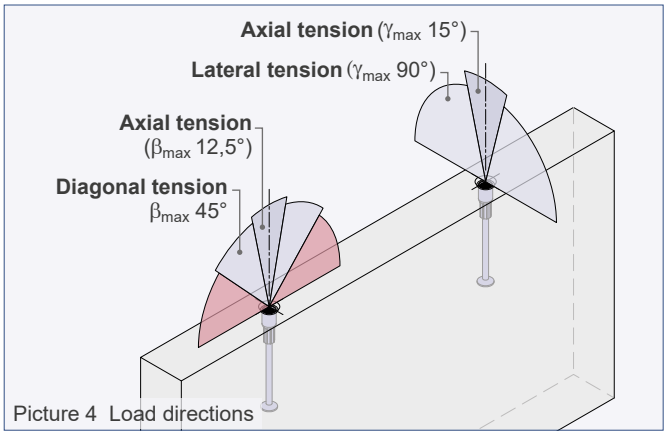
Step 1:
Table 2 shows the maximum possible threaded anchor sizes per element thickness as a function of the load case.

Table 2: Element thickness and max. anchor size for $f_{cc} \geq 15$ N/mm² / $f_{cc} \geq 20$ N/mm²

Element thickness	Transport anchor [Type]		
	Axial tension	**Diagonal tension**	**Lateral tension**
d [mm]	β_{max} 12.5° γ_{max} 15°	β_{max} 45° γ_{max} 15°	β_{max} 45° γ_{max} 90°
60	RD 12	-	-
70	RD 14	RD 12	-
80	RD 16	RD 16	RD 16
90		RD 18	
95	RD 18		
100		RD 20	RD 18
105	RD 20		
110			RD 20
120	RD 24	RD 24	RD 24
125	RD 30		
130	RD 36	RD 30	
140	RD 42		
150	RD 52		RD 30
160		RD 42	
200		RD 52	RD 36
220			RD 42
280			RD 52

Step 2:
Details of the load bearing capacities and boundary conditions as a function of the concrete compressive strength are given in the following tables:

- **Axial tension:** **Table 3** (15 / 20 N/mm²)
- **Diagonal tension:** **Table 4** (15 / 20 N/mm²)
- **Lateral tension:** **Table 5** (15 / 20 N/mm²)



Picture 4 Load directions

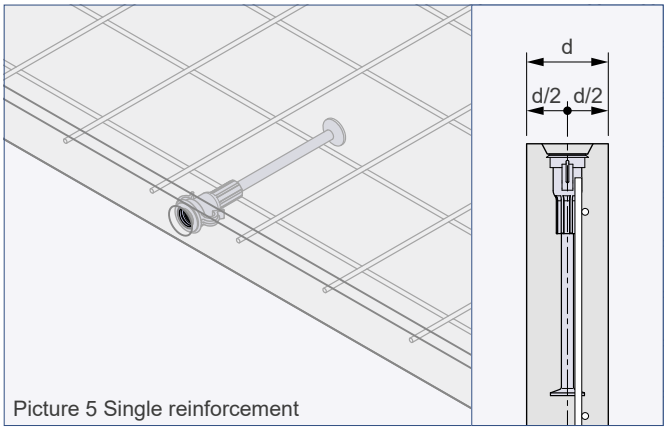
On lateral tension the Compact anchors have only half of the capacity compared to axial loading. However, this is not a limitation as during tilt-up only half of the weight has to be lifted (please refer to the General Installation Instruction).

Reinforcement

Minimum reinforcement

In use of Compact anchors precast units must be reinforced with a minimum reinforcement. Depending on the load case this can differ and is specified in the tables of the respective load case. This minimum reinforcement can be replaced by a comparable steel bar reinforcement. The user is personally responsible for further transmission of load into the concrete unit.

Existing static or constructive reinforcement can be taken into account for the minimum reinforcement of the respective load case.



Picture 5 Single reinforcement

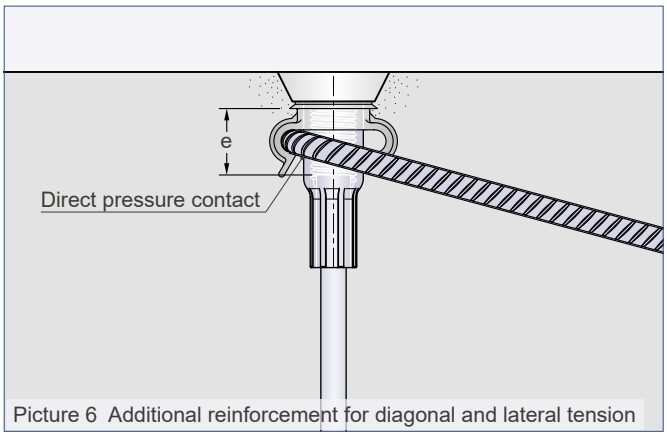
Single-layer reinforcement

In order to ensure a central anchor position in the element, the mesh reinforcement has to be cut in this area (see Picture 5) in case of single-layer reinforcement.

The installation of a single-layer reinforcement requires for all subsequent loads (e.g. within a transport chain) the attention of the load directions.

Add. reinforcement for diagonal and lateral tension

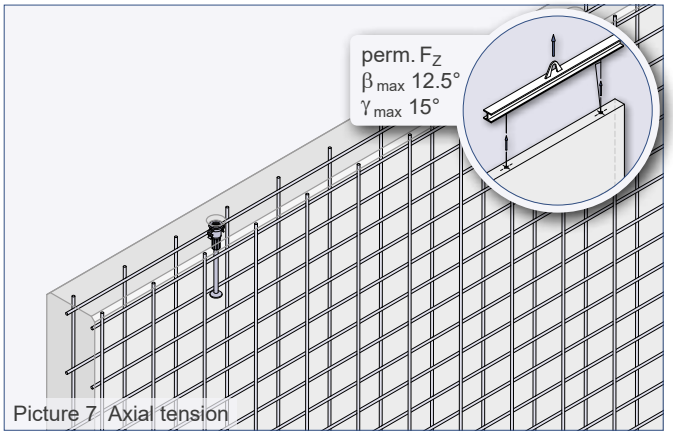
Additional reinforcement for diagonal and lateral tension has to be installed with pressure contact to the anchor insert. The position of the direct pressure contact must be within the thread reach e of the insert (see Picture 6). By using the Marking ring with clip (74KR__CLIP) this position is guaranteed.



Picture 6 Additional reinforcement for diagonal and lateral tension

Axial tension: Permissible load bearing capacities and boundary conditions

If the Compact anchor is used in axial load β_{max} 12.5° / γ_{max} > 15° an additional reinforcement according to Table 3 is required.



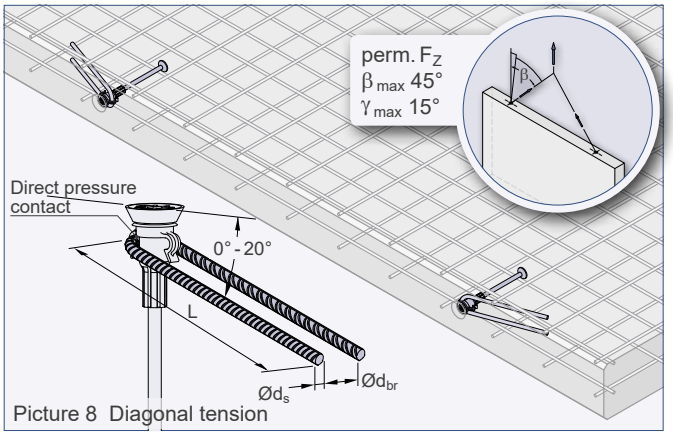
Picture 7 Axial tension

Table 3: Axial tension if $f_{cc} \geq 15$ N/mm² / 20 N/mm²

Load class	Min. element thickness min. centre and edge distances			β_{max} 12.5° / γ_{max} 15° allow. F_Z		Mesh reinforcement (square)
				$f_{cc} \geq 15$ N/mm²	$f_{cc} \geq 20$ N/mm²	
	d [mm]	a_a [mm]	a_r [mm]	[kN]	[kN]	[mm²/m]
12	60	300	150	5.0	5.0	1 × #131
14	70	400	200	8.0	8.0	1 × #131
16	80	400	200	11.7	12.0	1 × #131
18	95	500	250	16.0	16.0	2 × #188
20	105	600	300	20.0	20.0	2 × #188
24	120	600	300	25.0	25.0	2 × #188
30	125	700	350	40.0	40.0	2 × #188
36	130	800	400	62.8	63.0	2 × #188
42	140	1000	500	80.0	80.0	2 × #188
52	150	1200	600	125.0	125.0	2 × #188

Diagonal tension: Permissible load bearing capacities and boundary conditions

If the Compact anchor is used under diagonal tension $\beta > 12.5°$ an additional reinforcement according to Table 4 is required. Here the reinforcement for diagonal tension is placed contrarily to the tensile direction (Picture 8) and must have direct pressure contact to the anchor insert in the peak of its bending. The installation of the rebars for diagonal tension can be done in an anglke of 0° bis 20° to the concrete surface. If an installation angle of 0° is given the transport anchor has to be installed in a deeper position (e.g. By using a nailing plate) in order to reach the minimum required concrete covering.



Picture 8 Diagonal tension

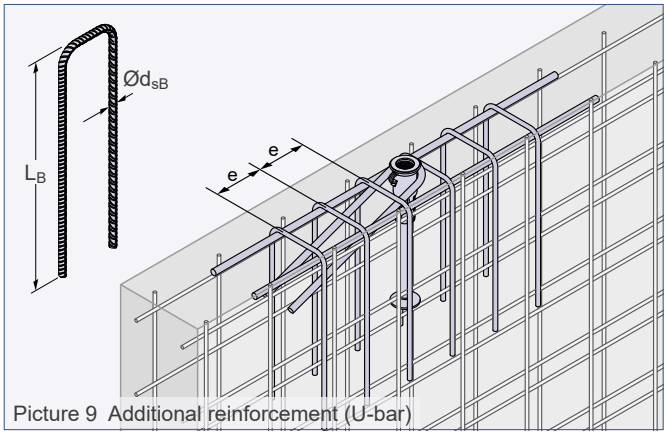
Table 4: Diagonal tension if $f_{cc} \geq 15$ N/mm² / 20 N/mm²

Load class	Min. element thicknesses, min. centre and edge distances			β_{max} 45° / γ_{max} 15° perm. F_Z		Add. reinforcement			
				f_{cc} ≥ 15 N/mm²	f_{cc} ≥ 20 N/mm²	Mesh reinforcement	Add. reinforcement for diagonal tension (B500A)		
	d [mm]	a_a [mm]	a_r [mm]	[kN]	[kN]	(square) [mm²/m]	$Ød_s$ [mm]	L [mm]	$Ød_{br}$ [mm]
12	70	300	150	5.0	5.0	1 × #131	6	150	18
14	80	400	200	8.0	8.0	1 × #188	8	200	24
16	80	400	200	11.2	12.0	1 × #188	8	200	24
18	90	500	250	16.0	16.0	1 × #188	10	250	30
20	100	600	300	20.0	20.0	2 × #188	10	300	40
24	120	600	300	25.0	25.0	2 × #188	10	300	40
30 ③	130	700	350	40.0	40.0	2 × #257	12	350	48
36 ③	160	800	400	63.0	63.0	2 × #257	14	400	56
42 ③	160	1000	500	80.0	80.0	2 × #257	14	500	56
52 ③	200	1200	600	125.0	125.0	2 × #257	20	600	86

① For this unit thickness, additional reinforcement according to Table 4a is required

Table 4a: Additional reinforcement for diagonal tension

Load class	Lengthwise reinforcement (B500A)		Stirrup in anchor area (B500A)			
	Ø [mm]	Length [mm]	Quantity [pcs.]	$Ød_{sB}$ [mm]	L_B [mm]	e [mm]
30	12	800	6	8	350	130
36	12	800	6	8	400	150
42	12	1000	6	8	500	150
52	12	1200	6	10	600	150

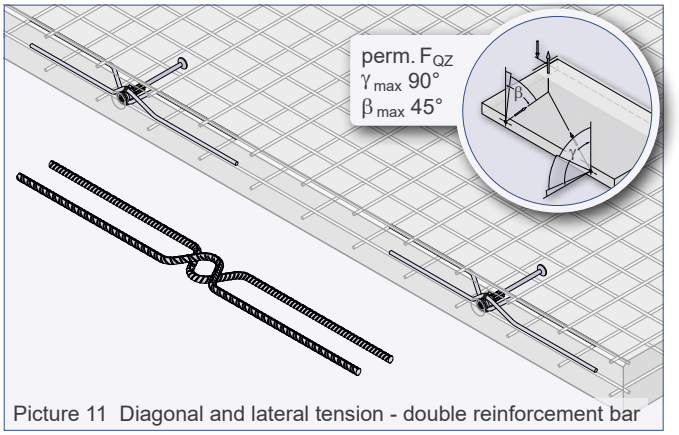


Picture 9 Additional reinforcement (U-bar)

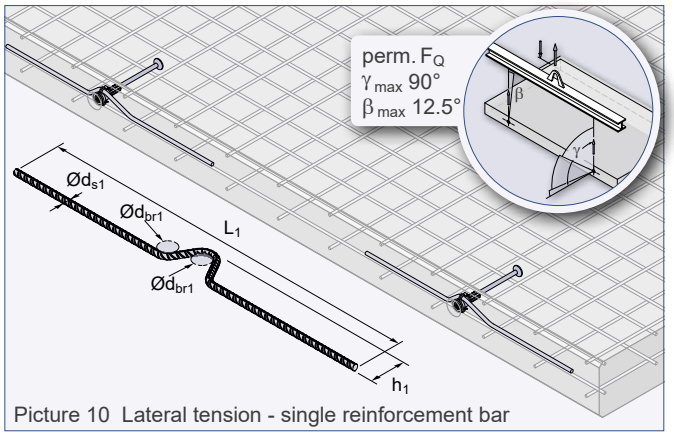
Lateral tension: Permissible load bearing capacities and boundary conditions

If an Compact anchor is loaded by lateral tension with an inclination of $\gamma > 15°$ an additional reinforcement is required according Table 5 and 5a. The reinforcement for lateral tension can be done as a single reinforcement bar (Picture 10), double reinforcement bar (Picture 11) or reverse reinforcement bar for lateral tension (Picture 12). There must be direct pressure contact between the insert of the transport anchor and the reinforcement in the peak of the bending. The reinforcement for lateral tension is installed in the front side of the wall contrary to the load direction. Tilting of walls can cause diagonal and lateral tension at the same time (Picture 11 and 12). In this case only the reinforcement for lateral tension is required (reverse reinforcement bar or double reinforcement bar). The diagonal tension is already covered by using this reinforcement. During mounting the tilt-up or turn-over of a unit requires lateral reinforcement (single reinforcement bar according to Picture 10 or reverse reinforcement bar for lateral tension according to Picture 12).

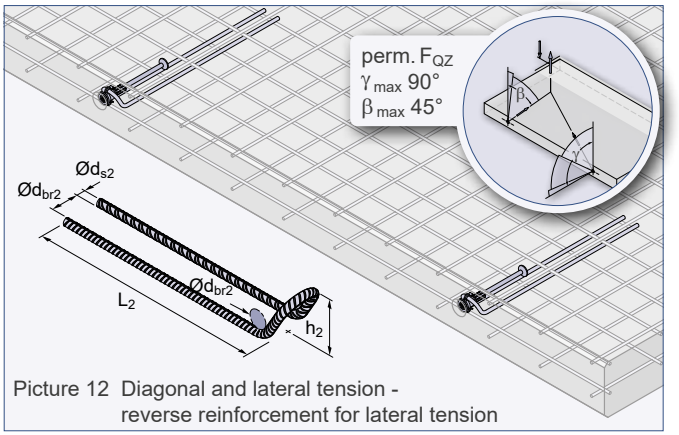
The double reinforcement tail for lateral tension (Picture 11) covers standard lifting directions.



Picture 11 Diagonal and lateral tension - double reinforcement bar



Picture 10 Lateral tension - single reinforcement bar



Picture 12 Diagonal and lateral tension - reverse reinforcement for lateral tension

Table 5: Lateral tension if $f_{cc} \geq 15$ N/mm² / 20 N/mm²

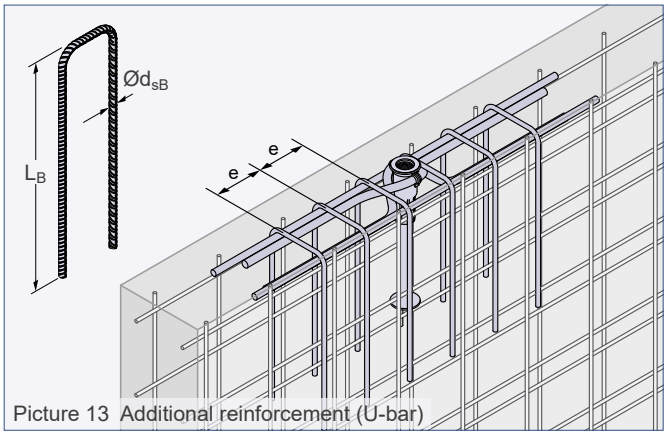
Load class	Min. element thicknesses, min. centre and edge distances			γ_{max} 90° / β_{max} 45° ④									
				perm. F_{QZ}		Add. reinforcement for lateral tension							
				f_{cc} ≥ 15 N/mm²	f_{cc} ≥ 20 N/mm²	Mesh reinforcement (square) ④	Single reinforcement bar (B500A)				Reverse reinforcement (B500A)			
	d [mm]	a_a [mm]	a_r [mm]	[kN]	[kN]	[mm²/m]	Ød$_{s1}$ [mm]	L_1 [mm]	h_1 [mm]	Ød$_{br1}$ [mm]	Ød$_{s2}$ [mm]	L_2 [mm]	h_2 [mm]	Ød$_{br2}$ [mm]
12	80	300	150	2.5	2.5	1 × #131	6	300	34	24	6	150	34	24
14	80	400	200	3.6	4.0	1 × #188	8	400	39	32	8	200	39	32
16	80	400	200	4.4	5.1	1 × #188	8	400	39	32	8	200	39	32
18 ⑤	100	500	250	8.0	8.0	2 × #188	10	500	48	40	10	250	48	40
20 ⑤	110	600	300	10.0	10.0	2 × #188	12	600	55	48	12	300	55	48
24 ⑤	120	600	300	12.5	12.5	2 × #188	12	600	73	48	12	300	73	48
30 ⑤	150	700	350	20.0	20.0	2 × #257	14	700	88	56	14	350	88	56
36 ⑤	200	800	400	31.5	31.5	2 × #257	14	800	115	56	14	400	115	56
42 ⑤	220	1000	500	40.0	40.0	2 × #257	16	1000	123	64	16	500	123	64
52 ⑤	280	1200	600	60.3	62.5	2 × #257	20	1200	170	140	20	600	170	140

④ For the reinforcement "single reinforcement bar" (picture 10) only F_Q (β_{max} 12.5°) is permissible!
⑤ For this unit thickness, additional reinforcement according to Table 5 is required

Lateral tension: Permissible load bearing capacities and boundary conditions

Table 5a: Additional reinforcement for lateral tension

Load class	Longitudinal reinforcement (B500A)		Stirrup in anchor area (B500A)			
	Ø [mm]	Length [mm]	Quantity [pcs.]	$Ød_{sB}$ [mm]	L_B [mm]	e [mm]
18	10	500	4	6	250	150
20	12	600	4	8	300	150
24	12	600	4	8	300	150
30	16	700	6	8	350	130
36	16	800	6	8	400	150
42	16	1000	8	8	500	130
52	20	1200	8	10	600	150



Picture 13 Additional reinforcement (U-bar)

Notes:

Our customers trust us to deliver.
We do everything in our power to reward their faith and we start each day intending to do better than the last. We provide strength and stability in an ever-changing world. We provide it support.

Welcome to the PHILIPP Group

Sustainable solutions

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