PHILIPPGROUP

Threaded transport anchor - long wavy tail

VB3-T-003-en - 04/25 - PDF

Installation and Application Instruction

Our products from the division
BUILDING SOLUTIONS

SERVICES

» On-site tests -> we ensure that your requirements are properly covered by our planning.

» Test reports -> for your safety and documentation.

» Trainings -> the knowledge of your employees from planning and production is enhanced by our experts on site, online or via webinar.

» Planning support -> latest design software, planning documents, CAD data and much more can be downloaded any time from www.philipp-group.de.

HIGH DEMANDS ON PRODUCT SAFETY AND PRACTICALITY

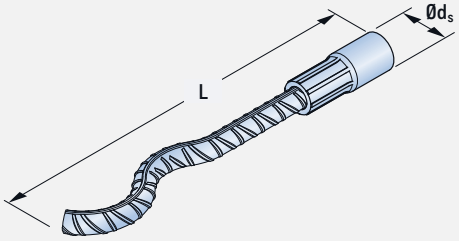
» Close cooperation with notified bodies and - if necessary - approval of our solutions.

TECHNICAL DEPARTMENT

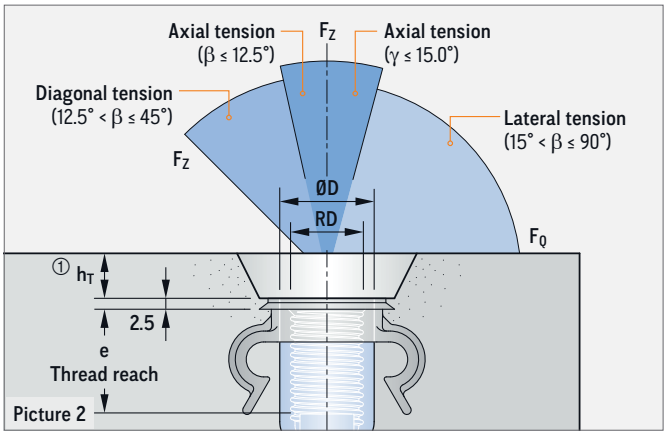
» Our expert-team will support you at any time during your planning phase with detailed advice.

CONTENT

GENERAL PRODUCT INFORMATION



Picture 1



Picture 2

The Threaded transport anchor in the long wavy tail version is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS Guideline "Lifting inserts and lifting systems for precast concrete elements" (VDI/BV-BS 6205). The use of Threaded transport anchors requires the compliance with this Installation and Application Instruction as well as the General Installation and Application Instruction.
The Application Instructions for the belonging PHILIPP lifting devices as well as the Data Sheets of the belonging PHILIPP accessories must be followed also. The anchor may only be used in combination with the mentioned PHILIPP lifting devices.
Threaded transport 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. This Installation and Application Instruction does not specify a repeated usage (e. g. ballasts for cranes) or a permanent fixation.

EC-DECLARATION OF CONFORMITY

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

TABLE 1: DIMENSIONS

Ref. no. ② galvanised	Type	Dimensions				
		RD	ØD (mm)	L (mm)	e (mm)	Ød$_s$ (mm)
67M12WE	12	12	15.0	137	22	8
67M16WE	16	16	21.0	216	27	12
67M20WE	20	20	27.0	257	35	16
67M24WE	24	24	31.0	350	43	16
67M30WE	30	30	39.5	450	56	20
67M36WE	36	36	47.0	570	68	25
67M42WE	42	42	54.0	620	75	28
67M52WE	52	52	67.0	750	100	32

① Mind the embedding depth h$_T$ of the corresponding Recess former and Retaining cap (picture 2).
② Also available in version stainless steel (ref. no. 75M__VAWE).

WERKSTOFFE

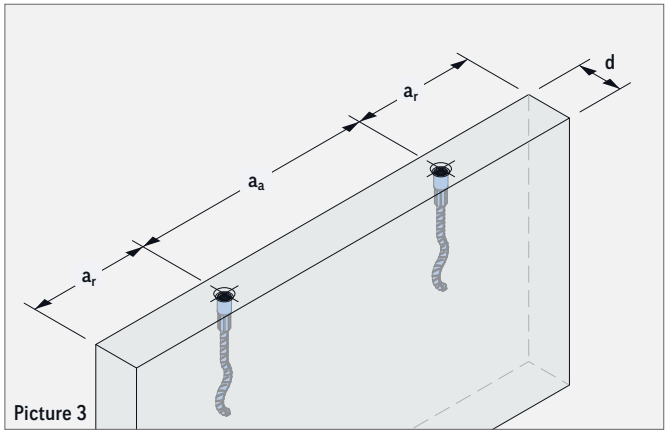
The Threaded transport anchors consist of a straight reinforcement bar B500B with crimped-on insert. All threaded inserts are made of special high precision steel tubes and are galvanised according to common standards.
This galvanisation protects the anchor temporarily from the storage at the producer 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 cut surface of the reinforcement bar 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

With the time of the first lift of the 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 ANCHOR

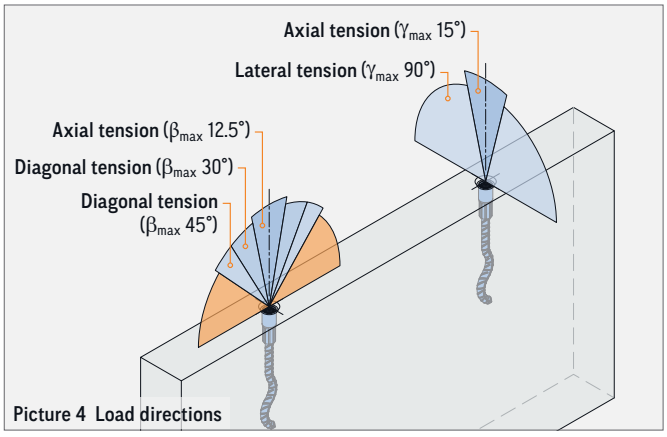
STEP 1:
Table 2 shows the maximum possible threaded anchor sizes per element thickness as a function of the load case.

TABLE 2: ELEMENT THICKNESSES AND MAX. ANCHOR SIZES

Element thickness d (mm)	Transport anchor (type) Axial tension β_{max} 12.5° γ_{max} 15°	Diagonal tension β_{max} 30° γ_{max} 15°	Diagonal tension β_{max} 45° γ_{max} 15°	Lateral tension β_{max} 45° γ_{max} 90°
80	RD 16	RD 16	RD 16	RD 16
100	RD 20	RD 20	RD 20	RD 20
120	RD 24	RD 24	RD 24	RD 24
130	RD 36	RD 36		
140	RD 42	RD 42	RD 30	RD 30
150	RD 52	RD 52		
200			RD 36	RD 36
240			RD 42	RD 42
275			RD 52	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 / 4** (15 / 20 N/mm²)
- **Diagonal tension:** **Table 5 / 6** (15 / 20 N/mm²)
- **Lateral tension:** **Table 7** (15 N/mm²)



Picture 4 Load directions

On lateral tension the Threaded transport anchors have only half of the capacity compared to axial loading. However, this is nota limitation as during tilt-up only half of the weight has to be lifted (please refer to the General Installation and Application Instruction).

REINFORCEMENT

MINIMUM REINFORCEMENT

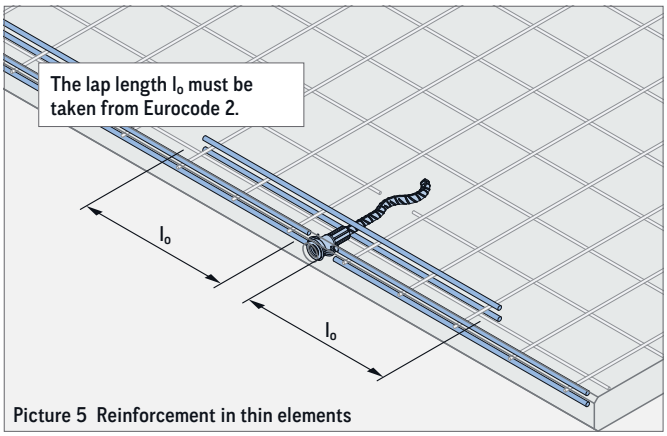
In use of Threaded transport anchors precast units must be reinforced with a minimum reinforcement. Depending on the load case this can differ and is specified in the tables of the respective load case. This minimum reinforcement can be replaced by a comparable steel bar reinforcement. The user is personally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

REINFORCEMENT INSTRUCTIONS FOR THIN ELEMENTS

In thin elements it might be necessary to cut the longitudinal reinforcement close to the insert (counter brace) in order to have enough concrete cover in this area. Best position for the longitudinal reinforcement should be below the crimping (see picture 5).

EXISTING REINFORCEMENT

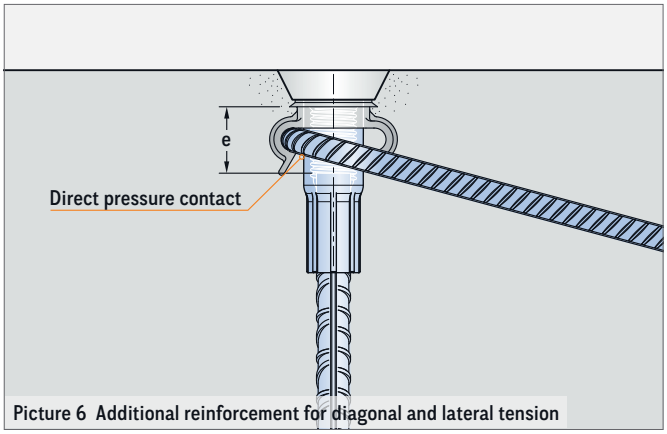
Existing static or constructive reinforcement can be taken into account for the minimum reinforcement of the respective load case.



Picture 5 Reinforcement in thin elements

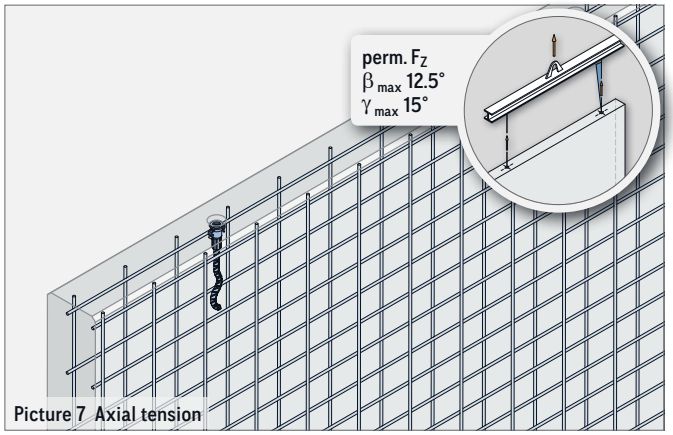
ADD. REINFORCEMENT FOR DIAGONAL AND LATERAL TENSION

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 (ref. no. 74KR__CLIP) this position is guaranteed.



Picture 6 Additional reinforcement for diagonal and lateral tension

PERMISSIBLE LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS: AXIAL TENSION



Picture 7 Axial tension

TABLE 3: AXIAL TENSION IF $f_{CC} \geq 15$ N/mm²

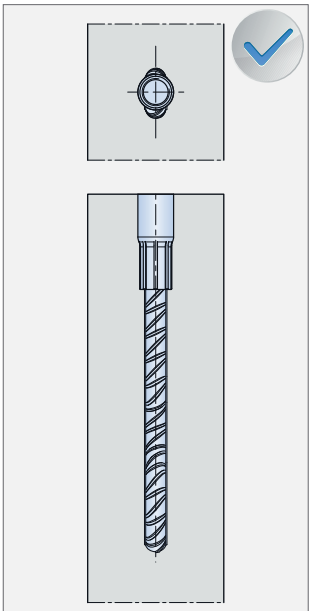
Load class	Element thicknesses, centre and edge distances			β_{max} 12.5° / γ_{max} 15° perm. F_Z	Mesh reinforcement (square)
	d (mm)	a_a (mm)	a_r (mm)	(kN)	(mm²/m)
12	60	300	150	5.0	2 × #131
16	80	400	200	12.0	2 × #131
20	100	550	275	20.0	2 × #188
24	120	600	300	25.0	2 × #188
30	140	650	350	40.0	2 × #188
36	200	800	400	63.0	2 × #188
42	240	1000	500	80.0	2 × #188
52	275	1200	600	125.0	2 × #188

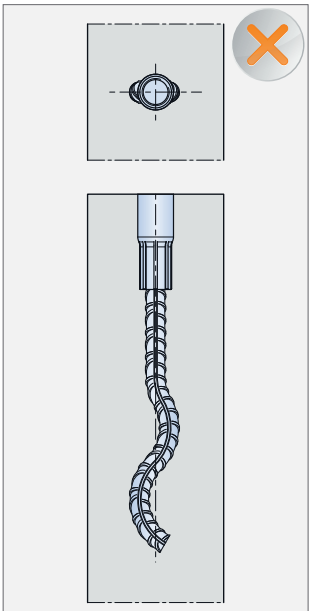
TABLE 4: AXIAL TENSION IF $f_{CC} \geq 20$ N/mm²

Load class	Element thicknesses, centre and edgedistances			β_{max} 12.5° / γ_{max} 15° perm. F_Z	Mesh reinforcement (square)
	d (mm)	a_a (mm)	a_r (mm)	(kN)	(mm²/m)
36	130	800	400	63.0	2 × #188
42	140	1000	500	80.0	2 × #188
52	150	1200	600	125.0	2 × #188

POSITION OF THE ANCHOR WAVE

When installing the threaded transport anchor, the position of the waved end shall be observed. Make sure that this is positioned parallel to the concrete element surface (picture 8a).

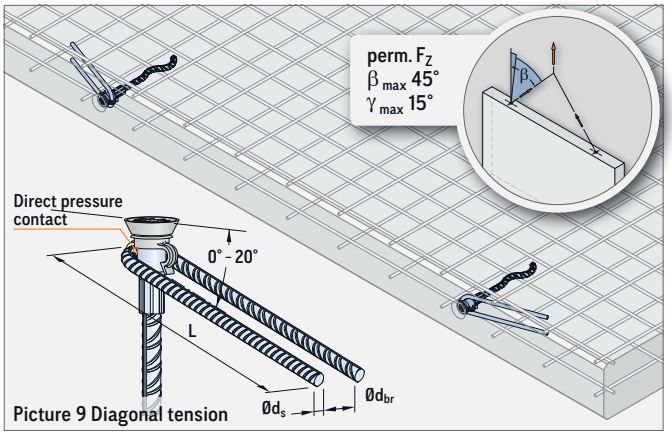

Picture 8a Correct position


Picture 8b Wrong position

PERMISSIBLE LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS: DIAGONAL TENSION

If the Threaded transport anchor is used under diagonal tension $\beta > 12.5°$ an additional reinforcement according to table 5 or 6 is required. Here the reinforcement for diagonal tension is placed contrarily to the tensile direction (picture 9) and must have direct pressure contact to the anchor insert in the peak of its bending. The installation of the reinforcement for diagonal tension can be done in an angle of 0° up to 20° to the concrete surface.

With an installation angle of 0°, the transport anchor must be installed in a recessed position (e.g. by using a Recess former), as this is the only way to ensure the required concrete cover for the bond.



Picture 9 Diagonal tension

TABLE 5: DIAGONAL TENSION IF $f_{cc} \geq 15$ N/mm²

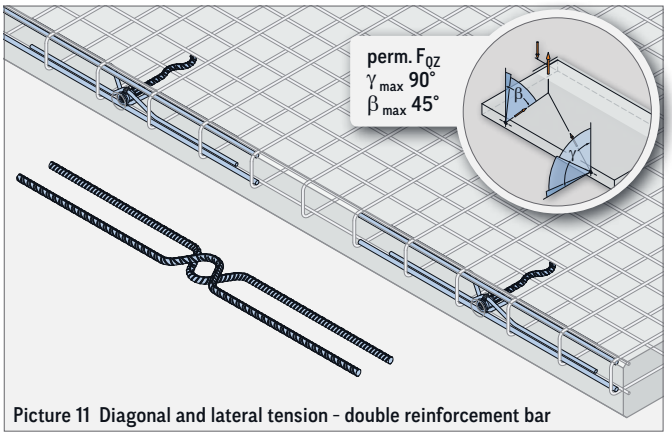
Load class	Element thicknesses, centre and edge distances			β_{max} 30° / γ_{max} 15° Additional reinforcement				β_{max} 45° / γ_{max} 15° Additional reinforcement			
				perm. F_Z	Mesh reinforcement (square)	Add. reinforcement for diagonal tension		perm. F_Z	Mesh reinforcement (square)	Add. reinforcement for diagonal tension	
	d (mm)	a_a (mm)	a_r (mm)	(kN)	(mm²/m)	$Ød_s$ (mm)	L (mm)	(kN)	(mm²/m)	$Ød_s$ (mm)	L (mm)	$Ød_{br}$ (mm)
12	60	300	150	5.0	2 × #131	6	150	24	5.0	2 × #131	6	150	24
16	80	400	200	12.0	2 × #131	6	250	24	12.0	2 × #131	8	200	32
20	100	550	275	20.0	2 × #188	8	250	32	20.0	2 × #188	8	300	32
24	120	600	300	25.0	2 × #188	8	300	32	25.0	2 × #188	10	300	40
30	140	650	350	40.0	2 × #188	10	350	40	40.0	2 × #188	12	400	48
36	200	800	400	63.0	2 × #188	12	450	48	63.0	2 × #188	14	550	56
42	240	1000	500	80.0	2 × #188	14	600	56	80.0	2 × #188	16	600	64
52	275	1200	600	125.0	2 × #188	16	700	67	125.0	2 × #188	20	750	140

TABLE 6: DIAGONAL TENSION IF $f_{cc} \geq 20$ N/mm²

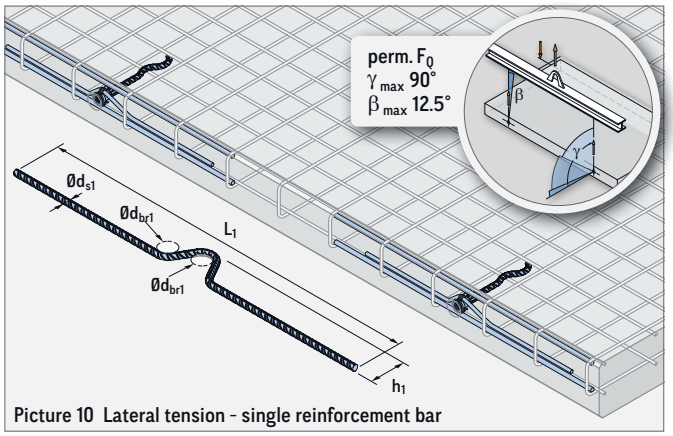
Load class	Element thicknesses, centre and edge distances			β_{max} 30° / γ_{max} 15° Additional reinforcement			
				perm. F_Z	Mesh reinforcement (square)	Add. reinforcement for diagonal tension	
	d (mm)	a_a (mm)	a_r (mm)	(kN)	(mm²/m)	$Ød_s$ (mm)	L (mm)	$Ød_{br}$ (mm)
36	130	800	400	63.0	2 × #188	12	450	48
42	140	1000	500	80.0	2 × #188	14	600	56
52	150	1200	600	125.0	2 × #188	16	700	67

PERMISSIBLE LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS: LATERAL TENSION

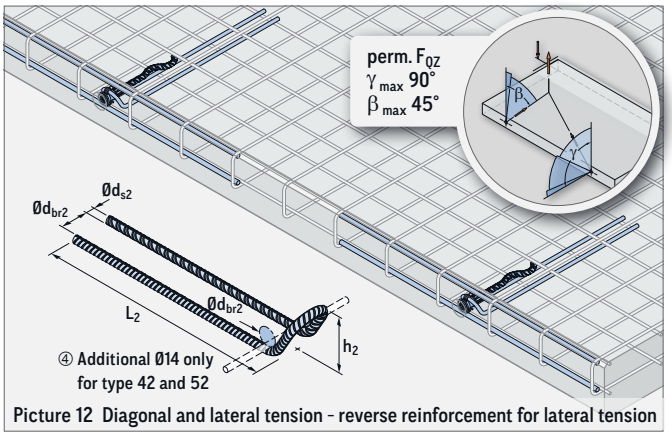
If an Threaded transport anchor is loaded by lateral tension with an inclination of $\gamma > 15°$ an additional reinforcement is required (table 7). The reinforcement for lateral tension can be done as a single reinforcement bar (picture 10), double reinforcement bar (picture 11) or reverse reinforcement bar (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 contrarily 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 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 according to picture 12). The double reinforcement bar for lateral tension (picture 11) covers standard lifting directions. With lateral tension the mesh reinforcement according to table 7 must be applied as a double-bended mesh. This double-bended mesh can be replaced by a comparable steel bar reinforcement. In addition to the double-bended mesh longitudinal reinforcement must be installed as shown in table 7.



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 7: DIAGONAL TENSION IF $f_{CC} \geq 15$ N/mm²

Load class	Element thicknesses, centre and edge distances			perm. F_{QZ}	γ_{max} 90° / β_{max} 45° ⑤ Additional reinforcement											
					Mesh reinforcement (square) ③	Add. reinforcement for lateral tension								Longitudinal reinforcement	
						Single reinforcement bar				Reverse reinforcement					
	d (mm)	a_a (mm)	a_r (mm)	(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)	Ø (mm)	Länge (mm)
12	80	300	150	2.5	2 × #131	6	500	49	24	6	270	35	24	10	850
16	80	400	200	6.0	2 × #131	8	600	49	32	8	420	49	32	10	850
20	100	550	275	10.0	2 × #188	10	800	64	40	10	490	64	40	12	850
24	120	600	300	12.5	2 × #188	12	800	75	48	12	520	75	48	12	850
30	140	650	350	20.0	2 × #188	12	1000	92	48	12	570	92	48	16	1000
36	200	800	400	31.5	2 × #188	14	1000	118	56	14	690	118	56	16	1000
42	240	1000	500	40.0	2 × #188	16	1200	143	64	16 ④	830	143	64	16	1000
52	275	1200	600	62.5	2 × #188	20	1500	174	140	20 ④	930	174	140	20	1200

③ The mesh reinforcement shall be done as a double-bended mesh or by using similar rebars.
④ Additional Ø14, length = 600 mm required (see picture 12).
⑤ With the single reinforcement bar only the force directions F_Q are permissible (see picture 10).

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