PHILIPPGROUP

Threaded transport anchor - straight tail



VB3-T-002-en - 09/25 - PDF

Installation and Application Instruction

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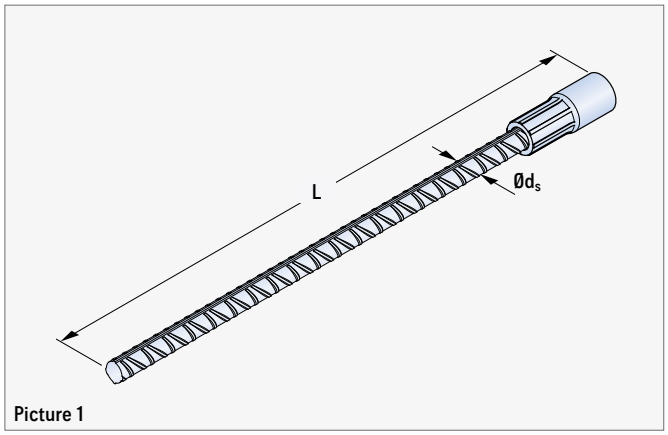


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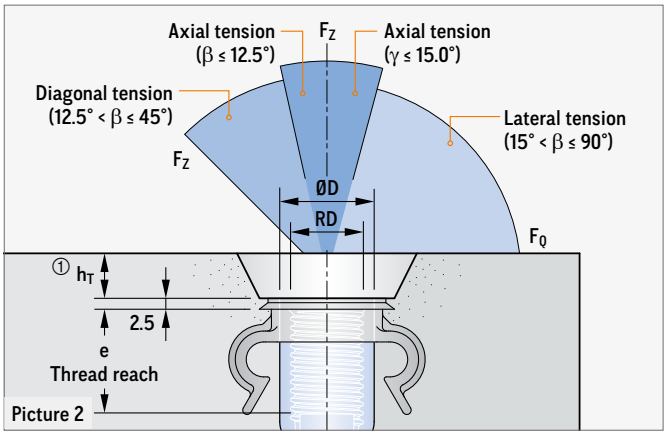
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Threaded transport anchor - straight tail

GENERAL PRODUCT INFORMATION



Picture 1



Picture 2

The Threaded transport anchor - straight tail is used for a face-side installation in wall-like elements. It 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 Apllication 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 - straight tail can be downloaded from our website www.philipp-group.de or is available on request.



TABLE 1: DIMENSIONS

Ref. no. ② bright zinc plated	Type	Dimensions				
		RD	ØD (mm)	L (mm)	e (mm)	Ød$_s$ (mm)
67M12	RD 12	12	15,0	195	22	8
67M16	RD 16	16	21,0	275	27	12
67M20	RD 20	20	27,0	355	35	16
67M24	RD 24	24	31,0	405	43	16
67M30	RD 30	30	39,5	505	56	20
67M36	RD 36	36	47,0	690	68	25
67M42	RD 42	42	54,0	840	75	28
67M52	RD 52	52	67,0	900	95	32

① Mind the embedding depth h_T of the corresponding Nailing plate and Retaining cap (picture 2).
② Types 12 - 52 also available in stainless steel (ref. no. 75M__VA).

MATERIALS

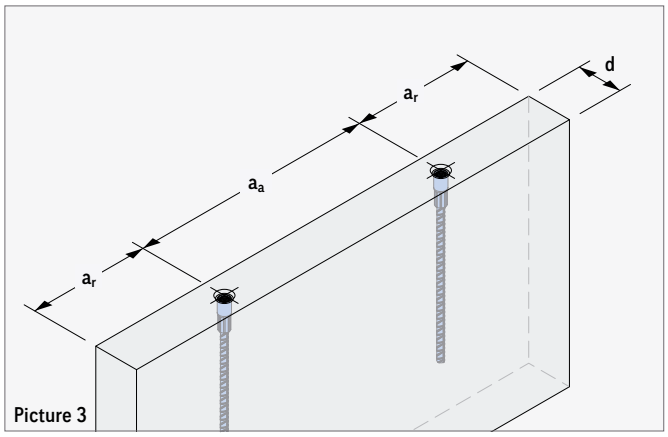
The Threaded transport anchors consist of a straight reinforcement bar B500B with crimped-on insert. The threaded inserts are made of special high precision steel tubes and are galvanised according to common standards. This galvanisation protects the anchor temporarily from the storage at the producer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

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.

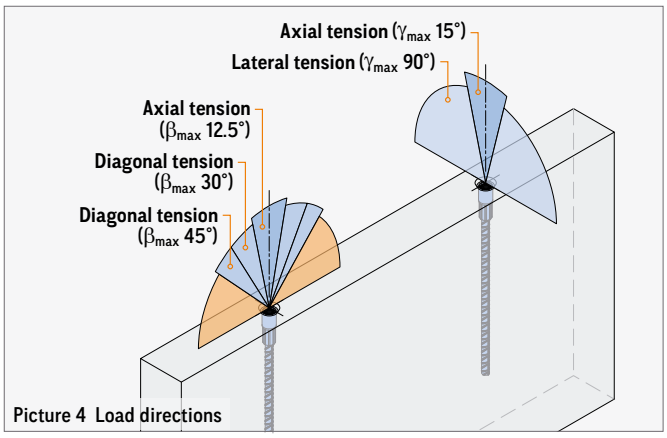
TABLE 2: ELEMENT THICKNESSES AND MAX. ANCHOR SIZES FOR $f_{cc} \geq 15$ N/mm² / $f_{cc} \geq 20$ N/mm²

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°
65	RD 16	RD 16	-	-
90	RD 20	RD 20	RD 16	RD 16
100	RD 24	RD 24	RD 20	RD 20
120	RD 42	RD 42	RD 24	RD 24
130				
140			RD 30	RD 30
150	RD 52	RD 52		
160				
180				
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 4 / 5** (15 / 20 N/mm²)
- **Diagonal tension:** **Table 6 / 7** (15 / 20 N/mm²)
- **Lateral tension:** **Table 8** (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 not a 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 transfer of load into the concrete unit.

EXISTING REINFORCEMENT

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

SINGLE-LAYER REINFORCEMENT

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

SINGLE-LAYER REINFORCEMENT

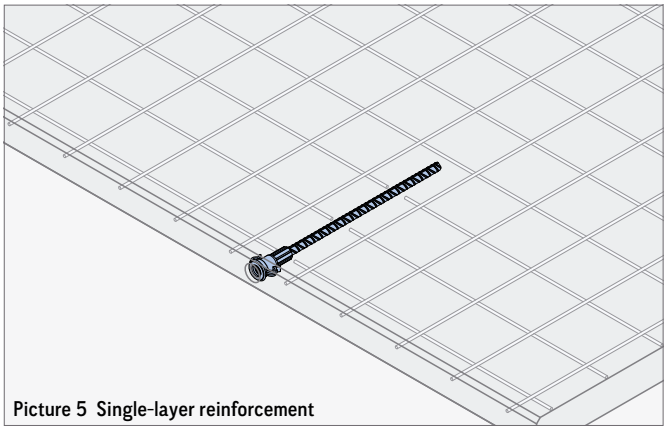
The installation of a single-layer reinforcement requires for all subsequent loads (e.g. within a transport chain) the attention of the load directions.

REINFORCEMENT INSTRUCTIONS FOR THIN ELEMENTS

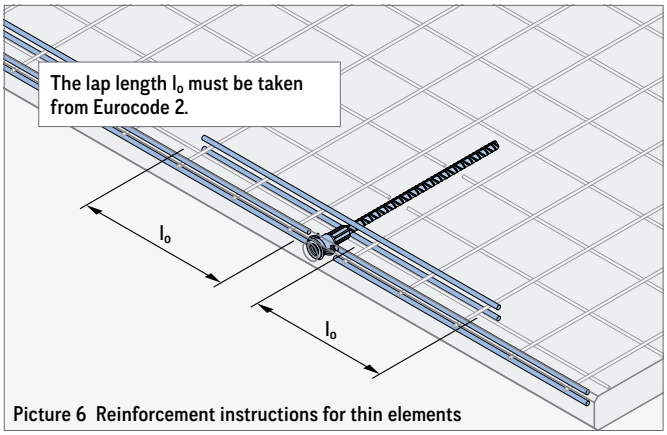
In thin elements it might be necessary to cut the longitudinal reinforcement close to the insert (counter brace) in order to have enough concrete cover in this area. Best position for the longitudinal reinforcement should be below the crimping (see picture 6).

ADD. REINFORCEMENT FOR DIAGONAL AND LATERAL TENSION

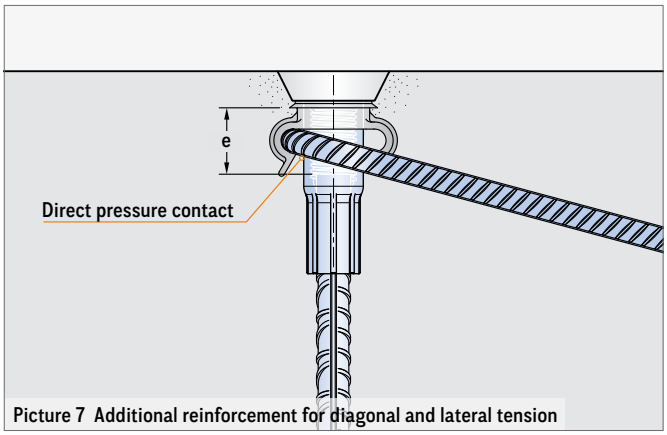
Additional reinforcement for diagonal and lateral tension shall be installed with pressure contact to the anchor insert. The position of the direct pressure contact must be within the thread reach e of the insert (see picture 7). By using the Marking ring with clip (74KR__CLIP) this position is guaranteed.



Picture 5 Single-layer reinforcement



Picture 6 Reinforcement instructions for thin elements



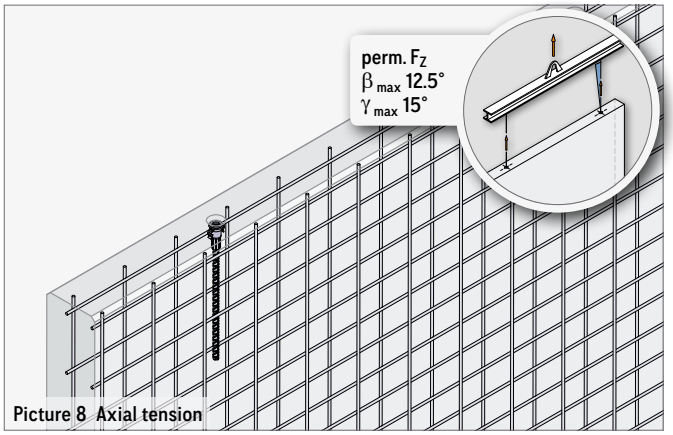
Picture 7 Additional reinforcement for diagonal and lateral tension

PERMISSIBLE LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS: 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
					1 × #188
16	65	400	200	12.0	2 × #131
					1 × #188
20	90	550	275	20.0	1 × #188
24	100	600	300	25.0	1 × #188
30	120	650	350	40.0	1 × #188
36	150	800	400	63.0	2 × #188
42	120 ①	1000	500	80.0	2 × #257
	160				2 × #188
52	180	1200	600	125.0	2 × #188

① For this unit thickness an additional reinforcement according to table 5 is required.



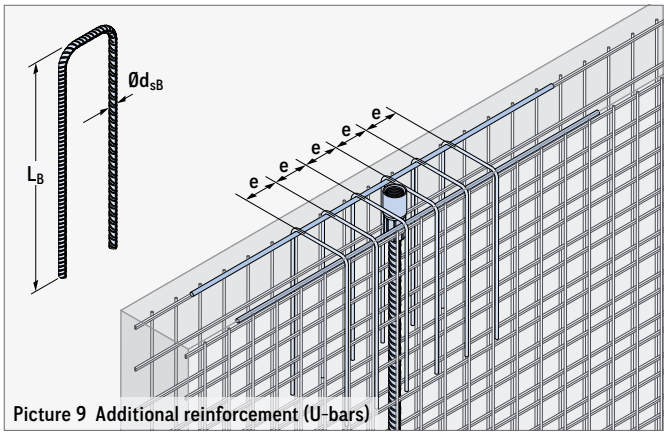
Picture 8 Axial tension

TABLE 4: AXIAL TENSION IF $f_{cc} \geq 20$ 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)
36	130	800	400	63.0	2 × #188
42	140	1000	500	80.0	2 × #188
52	150	1200	600	125.0	2 × #188

TABLE 5: ADDITIONAL REINFORCEMENT

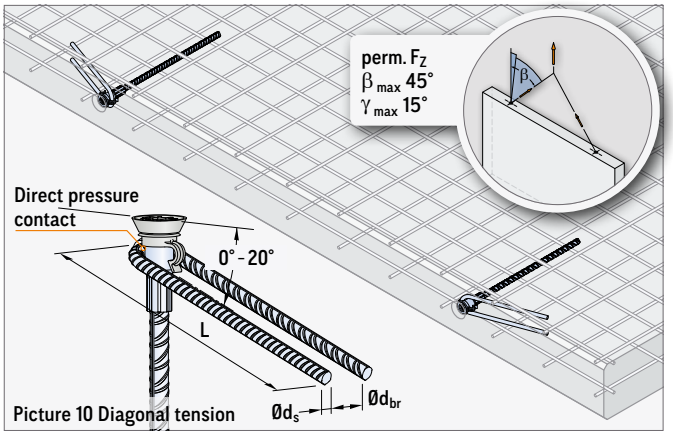
Load class	Longitudinal reinforcement		Stirrups in anchor area		
	Ø (mm)	Length (mm)	No. and $Ød_{sB}$	L_B (mm)	e (mm)
42	Ø10	1400	6 Ø6	400	150



Picture 9 Additional reinforcement (U-bars)

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 6 or 7 is required. Here the reinforcement for diagonal tension is placed contrarily to the tensile direction (picture 10) 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 Nailing plate), as this is the only way to ensure the required concrete cover for the bond.



Picture 10 Diagonal tension

TABLE 6: DIAGONAL TENSION IF $f_{cc} \geq 15$ N/mm²

Load class	Element thicknesses, centre and edge distances			β_{max} 30° / γ_{max} 15°					β_{max} 45° / γ_{max} 15°				
				perm. F_Z	Additional reinforcement				perm. F_Z	Additional reinforcement			
					Mesh reinforcement (square)	Add. reinforcement for diagonal tension				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)	(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	65	400	200	12.0	2 × #131	6	250	24	–	–	–	–	–
	80								12.0	2 × #131	8	200	32
	100				1 × #188				–	–	–	–	–
20	90	550	275	20.0	2 × #188	8	250	32	–	–	–	–	–
	100				1 × #188				20.0	2 × #188	8	300	32
24	100	600	300	25.0	1 × #188	8	300	32	–	–	–	–	–
	120				2 × #188				25.0	2 × #188	10	300	40
30	120	650	350	40.0	1 × #188	10	350	40	–	–	–	–	–
	140				2 × #188				40.0	2 × #188	12	400	48
36	150	800	400	63.0	2 × #188	12	450	48	–	–	–	–	–
	200								63.0	2 × #188	14	550	56
42	160	1000	500	80.0	2 × #188	14	600	56	–	–	–	–	–
	240								80.0	2 × #188	16	600	64
52	180	1200	600	125.0	2 × #188	16	700	67	–	–	–	–	–
	275								125.0	2 × #188	20	750	140

TABLE 7: DIAGONAL TENSION IF $f_{cc} \geq 20$ N/mm²

Load class	Element thicknesses, centre and edge distances			perm. F_Z	β_{max} 30° / γ_{max} 15° Additional reinforcement			
					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	120 ①	1000	500	80.0	2 × #257	12	450	56
	140				2 × #188	14	600	56
52	150	1200	600	125.0	2 × #188	16	700	67

① For this unit thickness an additional reinforcement according to table 5 is required.

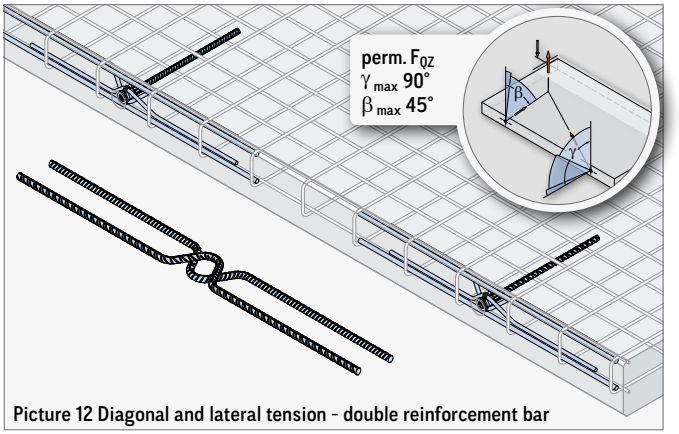
PERMISSIBLE LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS: LATERAL TENSION

If an Threaded transport anchor is loaded by lateral tension with an inclination of $\gamma > 15°$ an additional reinforcement is required (table 8). The reinforcement for lateral tension can be done as a single reinforcement bar (picture 11), double reinforcement bar (picture 12) or reverse reinforcement (picture 13). 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.

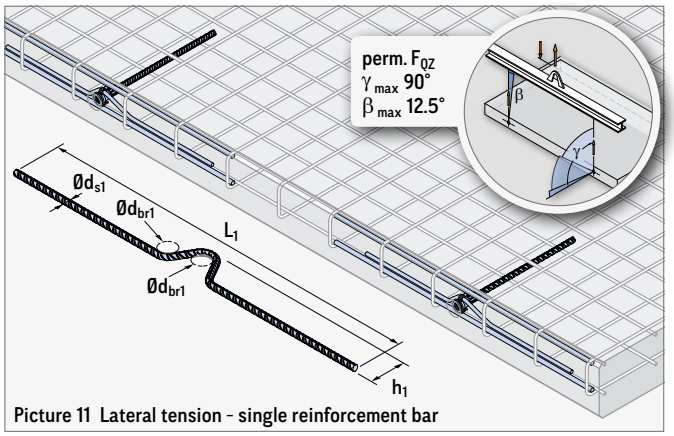
Tilting of walls can cause diagonal and lateral tension at the same time (picture 12 and 13). In this case only the reinforcement for lateral tension is required (reverse reinforcement or double reinforcement bar). The diagonal tension is already covered by using this reinforcement.

During mounting the tilt-up or turn-over of a unit requires lateral reinforcement (single reinforcement bar according to picture 11 or reverse reinforcement bar for lateral tension according to picture 13). The double reinforcement bar for lateral tension (picture 12) covers standard lifting directions.

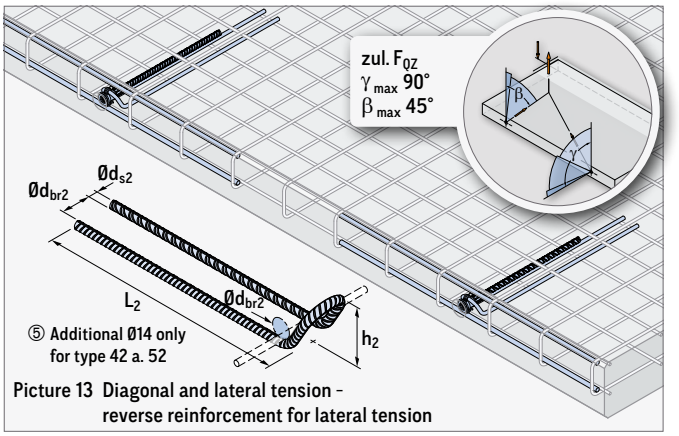
With lateral tension the mesh reinforcement according to table 8 must be applied as a mesh cap. This mesh cap can be replaced by a comparable steel bar reinforcement. In addition to the mesh cap longitudinal reinforcement must be installed as shown in table 8.



Picture 12 Diagonal and lateral tension - double reinforcement bar



Picture 11 Lateral tension - single reinforcement bar



Picture 13 Diagonal and lateral tension - reverse reinforcement for lateral tension

TABLE 8: LATERIAL 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° ⑥ Additional reinforcement										
					Mesh reinforcement (square)	Add. reinforcement for lateral tension								Longitudinal reinforcement	
						Single reinforcement bar				Reverse reinforcement					
	d (mm)	a_a (mm)	a_r (mm)	(kN)	④ (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)	Length (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 ⑤	830	143	64	16	1000
52	275	1200	600	62.5	2 × #188	20	1500	174	140	20 ⑤	930	174	140	20	1200

④ The mesh reinforcement shall be done as a mesh cap or by using similar rebars.
⑤ Additional Ø14, length = 600 mm required (see Picture 13)
⑥ For the reinforcement "single reinforcement bar" (Picture 11) only β_{max} 12.5° is permissible!

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